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EFFECTIVENESS OF THREE FOODSERVICE EQUIPMENT TRAINING INTERVENTIONS FOR FOOD AND NUTRITION STUDENTS

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ABSTRACT

This study evaluated students' ($N = 65$) reported knowledge, competence, and comfort in using foodservice equipment, as well as confidence in training others after completing one of the following interventions: 1) two food/nutrition courses, and foodservice supervised practice rotations, 2) equipment introduction, and competency exam, and 3) equipment training, practice lab, and competency exam. Foodservice operations and dietetics programs should consider implementing Intervention 3 because there was a significant increase in knowledge, competence, comfort, and confidence using equipment from pre- to post-intervention, it yielded the highest post-intervention scores, and most students received >86% for their actual skill.

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INTRODUCTION

Training is key to a successful foodservice operation (Okeiyi, Finley, & Postel, 1994). Training is defined as “the process of learning the skills you need to do a particular job or activity” ("Training," n.d.). The National Restaurant Association emphasizes the need for employees and managers to have training on kitchen equipment to ensure that they know how to correctly operate, clean, and perform preventative maintenance on all pieces of equipment ("National Restaurant Association, Manage My Restaurant," n.d.). Lack of employee training can cost foodservice operations thousands of dollars if improper use of equipment shortens the equipment's service life (White, 2012). If users are not properly trained, they are at risk for injuring themselves or others (Sinclair et al., 2003), and they are not getting the full use of the equipment (White, 2012). Training should be tailored to each specific piece of equipment to ensure employees can perform all necessary tasks (White, 2012). Training for quantity foodservice equipment (large scale commercial kitchen equipment that is used for preparing food for large amounts of people) (Payne-Palacio & Theis, 2016) is especially important because

users are less likely to have prior experience using the equipment. Equipment training is important and emphasized for foodservice operations, and is a competency for dietetic students ("ACEND Accreditation Standards for Nutrition and Dietetics Coordinated Programs," 2016); however, there is a lack of research and documented studies on the effectiveness, perceptions, attitudes towards training, and the transfer of training to the workplace (Rodríguez & Gregory, 2005).

Results from studies of food safety training suggest the benefit of training, and identify effective training methods. Multiple studies reported training resulted in significant knowledge changes (Costello, Gaddis, Tamplin, & Morris, 1997 & Park, Kwak, & Chang, 2010 & Sinclair et al., 2003 & Sparkman, Briley, & Gillham, 1984). However, changes in behavior were less common (Sparkman et al., 1984). Park et al. (2010) noted no behavior changes in employee practice or sanitation after training, this could be because no hands-on training was available. The Social Cognitive Theory and the Social Learning Theory can be applied to the concept of training as self-efficacy is increased through mastery experiences, such as hands-on training (Bandura, 1988). Hands-on training programs contribute towards the enhancement of employees' skills and knowledge, and encourage changes in attitude and behaviors (Medeiros, Cavalli, Salay, & Proença, 2011 & Park, et al., 2010).

Both Scotland High School and the U.S. Army Quartermaster Corps and Quartermaster School in Fort Lee, Virginia have good training programs in practice and are great examples of what a good training program can look like; however, they have not been evaluated or studied. Steve Dibble, a culinary instructor at Scotland High School, demonstrates how equipment works, starting from how to turn units off and on, and demonstrating how to take it apart and

put it back together (White, 2012). Dibble then watches the students perform these tasks until they are comfortable and perform the jobs properly (White, 2012). The U.S. Army Quartermaster Corps and Quartermaster School in Fort Lee, Virginia offers an entry-level foodservice specialist course which is taken by approximately 4,000 soldiers and marines annually ("U.S. Army Quartermaster Corps and Quartermaster School, Fort Lee, Virginia," 2013). The course provides extensive hands-on training with the foodservice equipment they will be using at their work stations ("U.S. Army Quartermaster Corps and Quartermaster School, Fort Lee, Virginia," 2013). Participants in the course take a written exam and are evaluated using the equipment ("U.S. Army Quartermaster Corps and Quartermaster School, Fort Lee, Virginia," 2013). Upon completion of the course the participants have gained experience, knowledge, and confidence in their ability to operate and perform tasks on the equipment ("U.S. Army Quartermaster Corps and Quartermaster School, Fort Lee, Virginia," 2013).

There is limited research and validated foodservice equipment training programs available in the foodservice sector and in dietetics education. In addition, few studies evaluated the effect that training had on actual performance (Rodríguez & Gregory, 2005). For these reasons further research on the effectiveness of quantity foodservice equipment training is necessary. This study evaluated three foodservice equipment training strategies in terms of nutrition and dietetic students' reported knowledge, competence, comfort in using foodservice equipment, and confidence in training others to use foodservice equipment. Actual skill was assessed in Intervention 3. Therefore, the purpose of this study was to compare nutrition and dietetic students' knowledge, competence, and comfort in using foodservice equipment, as well as confidence in training others to use foodservice equipment before and after completing one

the following interventions: 1) completion of one quantity food equipment and production course and one management course, including an equipment introduction walk through, and supervised practice rotations in campus foodservice establishments, 2) equipment introduction walk through, optional open labs times, and an equipment competency exam, and 3) extensive equipment training, optional open labs times, practice lab, and an equipment competency exam.

METHODS

This quasi-experimental study assessed three different iterations of equipment training as part of a foodservice management course. In this study, each iteration is described as an intervention. These three different interventions were implemented over the course of three years: 2013-2014, 2014-2015, and 2015-2016. All three interventions aimed to increase students' knowledge, competence, comfort level, and confidence in training others to use quantity foodservice equipment on all the following fourteen pieces of equipment: combination oven/steamer, cook/hold/smoke/oven, commercial microwave, convection oven, slicer, steam-jacketed kettle, tilting-braising pan, 20 and 60 quart mixers, dishwasher, combination microwave/convection oven, dice (food processor), gas range, and salamander broiler. The Institutional Review Board (IRB) at one university in the Pacific Northwest certified this project as exempt.

Participants

Participants were food and nutrition students including dietetic students enrolled in a quantity food equipment and production course at one university in the Pacific Northwest. All participants in Intervention 1 were dietetic students.

Interventions

There were three interventions aimed at increasing students' knowledge, competence, comfort level, and confidence in training others to use food service equipment. Refer to Table 1 to see the components that were in each intervention.

Intervention 1. Intervention 1 included the completion of one quantity food equipment and production course: Family and Consumer Science Quantity Food Production and Equipment, and one management course: Family and Consumer Science Food Systems Management. The quantity food course explored food production in large volume, and selection and use of institutional quantity foodservice equipment. Students completed an equipment evaluation assignment, in which they researched two different brands of the same piece of quantity foodservice equipment. Students evaluated the equipment comparing a number of factors: cooking capacity, dimensions, material, utility and plumbing requirements, freight and delivery specifications, installation requirements, warranties, certifications, estimated life of equipment, and cost of equipment. The management course examined institutional organization and management. Students were taken on an equipment introduction walk through of the foods lab by their instructor. A brief foods lab equipment walk through handout was provided, students were to initial off on each piece of equipment. As part both courses students also completed a theme meal project in groups of three to four students. The theme meal project required students to develop and prepare a lunch meal to be served to approximately 25 guests; therefore, students utilized the quantity foodservice equipment in the foods lab. Equipment manuals were available to students for review in the foods lab. Participants were all in the Coordinated Program in Dietetics (CPD) and also completed

supervised practice rotations in campus foodservice establishments. Students had the opportunity to work with chefs and kitchen staff on food preparation and cooking, using quantity foodservice equipment.

Intervention 2. Intervention 2 involved an equipment introduction walk through, optional open lab times, and an equipment competency exam. Intervention 2 students were enrolled in Family and Consumer Science Quantity Food Production and Equipment course; the interventions took place in the class. In class students were taken on an equipment introduction walk through by the instructor. Students were introduced to the fourteen pieces of quantity foodservice equipment. During the open lab times, students were able to ask the instructor questions on the equipment. Open lab times were optional for students to attend, but highly encouraged to be prepared for the exam. The equipment manuals were available to students on-line and in the foods lab. To assess the validity and clarity of the exam, the equipment competency exam was pilot tested before participants in Intervention 2 took the exam. Three students not enrolled in the Quantity Food Production and Equipment course piloted the exam. Students then took the practical equipment exam to demonstrate competency using all the pieces of equipment. The exam was completed independently; however, two other students were also completing their exam at the same time. Only dietetic students had completed some supervised practice rotations in campus foodservice establishments at the time of the equipment competency exam.

Intervention 3. Intervention 3 consisted of extensive equipment training, optional open lab times, a practice lab, and an equipment competency exam. Intervention 3 students were enrolled in Family and Consumer Science Quantity Food Production and Equipment course; the

interventions took place in the class. Refer to Table 2 to see a timeline of when the training, practice lab, and equipment exam took place. Before taking the exam students attended a two-hour, extensive foodservice equipment training in small groups (3-4 people). The instructor pilot tested the training to one nutrition professor before implementation. During the training the instructor explained and demonstrated how to turn on, operate, clean, and turn off each piece of equipment. Students then completed the same tasks. This was done for each piece of equipment. Students were given an equipment training note sheet to fill out during the training. Students received hands-on experience using all the quantity equipment in the foods lab. The instructor used a note sheet while providing the training, making sure each training session covered all the same material. A scribe was present at each training session to make sure that the training was consistent from session to session. Students also had the opportunity to attend open lab times, in which they could go through the steps of operating each piece of equipment. Students participated in a two-hour practice lab in the foods lab. The practice lab allowed students to cook with five pieces of equipment they felt least comfortable with after receiving the training. When students finished their practice lab they were given the opportunity to review the steps of using each piece of equipment and review the manuals, before leaving they completed a self-reflection assignment. The equipment manuals were available to students on-line and in the foods lab. The practice lab was completed independently; however, one other student was also completing their practice lab at the same time. Before Intervention 3 took the exam two nutrition professors and two students not enrolled in the Quantity Food Production and Equipment course piloted tested the exam twice. Students then took the practical equipment exam to demonstrate competency using all the

pieces of equipment. Working independently, two students completed their exam at the same time. During the exam the instructor assessed the students' ability to operate the equipment correctly. Through observation, the instructor assessed each students' actual skill on each piece of equipment. Only dietetic students had completed some supervised practice rotations in campus foodservice establishments at the time of the equipment competency exam.

Foodservice Equipment Survey

Retrospective pre- and post-intervention surveys collected demographic information as well as students' knowledge, competence, comfort using each piece of foodservice equipment, and confidence level in training others. Participants rated their responses on a 4-point scale ranging from not knowledgeable to very knowledgeable, etc. In Interventions 1 and 2, participants answered these questions for two time periods: before and after the intervention. In Intervention 3, participants answered these questions for three time periods: before the intervention, after participating in a practice lab, and after completing an equipment competency exam.

Survey Administration Procedures

All surveys were administered using Qualtrics, an online survey software (Qualtrics Research Suite (2014) [Computer software]. Provo, UT: Qualtrics, LLC.). For Intervention 1, participants received an email invitation to participate in an on-line retrospective pre- and post-intervention survey after the courses had ended. For Interventions 2 and 3, participants were invited in class to participate; they completed the retrospective pre- and post-intervention survey following completion of the equipment competency exam. Participants in Intervention

3 took an additional survey after participating in a practice lab and training, but before the equipment exam.

Data Analysis

Statistical significance was set at $p < 0.05$ for all tests. SPSS Statistics (IBM Corp. Released 2011. IBM SPSS Statistics for Windows. Version 22. Armonk, NY: IBM Corp) was used to complete the analysis.

Interventions 1, 2, and 3. Average scores across all pieces of equipment were calculated for knowledge, competence, comfort, and confidence in training others to use the foodservice equipment. Percent of students who had prior experience using each piece of quantity foodservice equipment was calculated. To test for normality, the Shapiro-Wilk test was conducted. This test compared the shape of the sample distribution to the shape of a normal curve. The significance value (p) was below 0.05 for pre- and post-intervention responses related to knowledge, competence, comfort level, and confidence in training others; therefore, the data significantly deviates from a normal distribution. The Levene Statistic tested the null hypothesis that the variances of pre- and post-knowledge, competence, comfort level, and confidence in training others are significantly different. The significance value (p) was greater than 0.05 for pre- and post-intervention responses related to knowledge, competence, comfort level, and confidence in training others; therefore, homogeneity of variance is assumed. Homogeneity of variance means that the variability of pre- and post-knowledge, competence, comfort level, and confidence in training others does not change from Interventions 1, 2, and 3. Due to the non-normal distribution, a non-parametric test was selected and results were reported as medians (ranges). The Jonckheere-Terpsta test was used

to test for a pattern to the medians of each variable (knowledge, competence, comfort level, and confidence in training others) across interventions in the following order: Intervention 1, Intervention 2, and Intervention 3. This test was conducted to evaluate trends across interventions for pre-intervention, post-intervention, and changes from pre- to post-intervention in levels of knowledge, competence, comfort level, and confidence in training others. Post hoc pairwise comparisons were conducted. It was hypothesized that there would be a positive trend for post-intervention levels, and changes from pre- to post-intervention with Intervention 1 having the lowest medians, Intervention 2 having the next highest medians, and Intervention 3 having the highest medians as evidenced by a positive Z score.

Intervention 3. The students were asked to rank each piece of equipment in order their competency from most (1) to least (14) competent. Medians were calculated to determine the pieces of equipment that students were most and least competent in using. The Friedman's test is a non-parametric test that uses mean ranks to test for differences between groups when the dependent variable being measured is ordinal. A Friedman's test was used to determine if there were differences in overall pre-, post-training, and post-exam knowledge, competence, comfort level, and confidence in training others to use foodservice equipment. Pre-, post-training, and post-exam knowledge, competence, comfort level, and confidence in training others to use foodservice equipment was ranked for each student, meaning that the lowest score out of pre-, post-training, and post-exam was assigned a rank of 1, then the next highest score was assigned a rank of 2, and the highest score was assigned a rank of 3. High scores were associated with higher ranks and lower scores with a lower rank. For each variable (knowledge, competence, comfort level, and confidence in training others) sum ranks were

calculated for pre-, post-training, and post-exam. Mean ranks were calculated by dividing the sum rank by the total number of students. Each student's actual skill for each piece of equipment was determined by the instructor during the exam. Students were considered competent by demonstrating their ability to complete each task: turn on the equipment, cook with the equipment, clean the equipment, and turn off the equipment. Failure to complete one or more of the tasks resulted in no score for that piece of equipment. Students reported their competence (skill) for each piece of equipment on a scale of 1-4, 1 not competent, 2 somewhat competent, 3 competent, and 4 highly competent. Each student received an actual skill score: pieces of equipment they used correctly out of the total number of pieces of equipment (14). Self-reported competence (skill) score was calculated by dividing their response by 4 (indicating highly competent). Spearman correlations were conducted to determine the strength and direction between the actual skill and self-reported competence (skill). A Bland-Altman plot compared the agreement between actual skill to self-reported competence (skill).

RESULTS

Participants in Intervention 1 ($n = 14$) were dietetic students, and in Intervention 2 ($n = 25$) and Intervention 3 ($n = 26$) participants were food and nutrition students, including dietetic students.

Interventions 1, 2, and 3

Intervention 1 had the highest percent of students who had prior experience using quantity foodservice equipment (average 31%) compared to Interventions 2 and 3 (average 20% and 14%, respectively). In all three Interventions the highest percentage of students reported prior experience using the dishwasher. The tilting braising pan and salamander broiler

had the lowest percentage of students' prior use (see Table 3). Intervention 1 had the highest level of all pre-intervention variables. Intervention 3 had the lowest level of all the pre-intervention variables. The trend for pre-knowledge, competence, comfort level, and confidence in training others decreased from interventions (see Table 4 and Figure 1). Intervention 3 had the highest levels of all post-intervention variables, higher than Interventions 1 and 2 (see Table 5 and Figure 2). Post-Intervention scores were not significantly different when comparing Interventions 1 and 2. Intervention 2 was higher in post-confidence in training others, while Intervention 1 was higher in post-knowledge, competence, comfort level. Intervention 3 had the greatest change from pre- to post-intervention changes across interventions (see Table 6 and Figure 3). This was expected as Intervention 3 had the lowest pre- and highest post-variables. Intervention 3 was higher than Interventions 1 and 2 across all variables.

Intervention 3

On the retrospective pre- and post-intervention survey students indicated that they were most competent using the following pieces of equipment: convection oven, dice (food processor), and dishwasher (see Table 7). Students reported that they were least competent in using the cook hold smoke oven, steam jacketed kettle, and gas range. Results from the Friedman's test indicate that there was a significant increase in knowledge, competence, comfort level, and confidence in training others using each piece of foodservice equipment calculated from pre-intervention to, post-exam (see Table 8).

Actual skill. Eighty-eight percent of students received 86% or better (maximum = 100%, minimum = 71%) on their actual skill. Actual skills from the exam were compared to self-

reported competence (skill), spearman correlations showed that there were no significant correlations. The Bland-Altman plot showed that there were points plotted on each side of the mean, with one outlier (see Figure 4). This tests identifies possible outliers and differences between the two groups. The Y axis is the difference of the actual skill and the self-reported competence (skill) (difference = actual skill - self-reported competence [skill]). The X axis is the mean of actual skill and the self-reported competence (skill). The plot reports the upper and lower 95% confidence limits and mean difference between the two measurements (middle line). Students ($n = 13$) reported a low skill level, but their actual skill level was higher than reported, under reporting. Students ($n = 7$) reported a high skill level, but their actual skill level was lower than reported, over reporting. Students ($n = 5$) reported a skill level and their actual skill level matched their reported.

DISCUSSION

These results indicate that there were improvements in knowledge, competence, and comfort in using foodservice equipment, as well as confidence in training others following each of the interventions. Students in Intervention 3 had the highest post-intervention score, despite the fact that students in Intervention 1 had the highest pre-intervention score and highest amount of prior experience using quantity foodservice equipment. With more training and experience from Interventions 1, 2 and 3, students' levels of knowledge, competence, and comfort in using foodservice equipment, as well as confidence in training others to use foodservice equipment were higher. Fifty percent or fewer had prior experience on most pieces of equipment. In all three interventions, the highest percentage of students had used a dishwasher prior to the intervention, while the tilting braising pan and salamander broiler had

the lowest percentage of students' prior use. The tilting braising pan and salamander broiler were less common in foodservice establishments.

The results of this study add to body of research as actual skill was assessed; not all training studies evaluated actual behavior. Students in Intervention 3 received an actual skill score, all students received an overall passing score. Most students received 86% or better. Following Intervention 3 (extensive equipment training, optional open labs times, practice lab, and an equipment competency exam) students were competent operating the equipment. It was determined that most students under report on their skill level to their actual skill level. If students were not certain of their ability to perform a task, this may negatively affect their competence when operating foodservice equipment. Students were operating the equipment correctly; however, their reported comfort level was low. This was possibly due to the fact it was an exam and students are typically stressed in exams.

The equipment training in this study was standardized and may be a more effective way to train students rather than supervised practice in campus foodservice establishments. Supervised practice rotations may differ from one dietetic student to the next at the exact same rotation, due to the daily variation in production tasks and kitchen staff. Also, supervised practice experience may differ from one university to another depending on what is available at the campus foodservice establishment(s).

Interventions 2 and 3 in this study followed good hands-on training practices, such as having the instructor demonstrating how to turn on and off, operate, and clean each piece of equipment then having each student repeat the same tasks for each piece of equipment ("U.S. Army Quartermaster Corps and Quartermaster School, Fort Lee, Virginia," 2013 & White, 2012).

In the current study for Interventions 2 and 3, students had hands-on experience as they took a practical exam on the equipment ("U.S. Army Quartermaster Corps and Quartermaster School, Fort Lee, Virginia," 2013). Intervention 3 allowed for mastery experiences during the practice lab and extensive equipment training. The findings from this study aligned with the Social Learning Theory and the Social Cognitive Theory, as self-efficacy was increased and desired behaviors were achieved.

While this study provides findings regarding the effectiveness of foodservice equipment training, certain limitations exist. The low sample size of Intervention 1 presents a limitation; this may have been because dietetic students were invited by email to complete a survey after the courses had already ended. A further limitation was that actual skills were only reported for Intervention 3; therefore, comparison between skills from intervention to intervention cannot be established. Actual skills were rated on a scale from 1-14, it would have made for an easier comparison on a Likert scale from 1-4, since the survey scale was from 1-4. Additionally, the participants in all interventions were mostly female and from one university in the Pacific Northwest. In Interventions 2 and 3 only a few of the dietetic students completed supervised practice rotations in campus foodservice establishments, this was not controlled for in the analysis. The instructor for the equipment training interventions was the same for all three interventions. During Intervention 1 the instructor was enrolled as a student in Quantity Food Production and Equipment, and Food Systems Management, while working on this equipment research as part of an undergraduate directed study course. During Interventions 2 and 3 the instructor was a student in the Coordinated Program in Dietetics (CPD), and was working on this study for graduate thesis research. Students may have treated their intervention experience

and survey participation less seriously as the instructor was a classmate and not a professor; however, professor oversight and mentorship was provided.

CONCLUSIONS AND APPLICATIONS

This study compared nutrition and dietetic students' knowledge, competence, and comfort in using foodservice equipment, as well as confidence in training others to use foodservice equipment after completing one the following interventions. These findings will allow for further research on this topic, such as monitoring the actual skill from after the time of the equipment exam. Future research for dietetic students could evaluate the effectiveness of supervised practice for training students on foodservice equipment among different universities. This same study could also be carried out at another university or a foodservice operation that has a quantity foodservice equipment. This research highlights the importance of foodservice equipment training for food and nutrition students, including dietetic students and also for foodservice operations and employees. Though further research should be done, this study gives good examples of a number of training options as knowledge, competence, and comfort in using foodservice equipment, as well as confidence in training others to use foodservice equipment increased after all interventions. Foodservice operations and dietetic programs should consider implementing Intervention 3 because it resulted in the greatest amount of change due to the extensive equipment training, and was verified with actual skill.

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TABLES AND FIGURES

*Table 1. Intervention methods for all three Interventions.
(Shaded box indicates inclusion in interventions.)*

Intervention	1	2	3
Dietetic students <i>Students in the Coordinated Program in Dietetics</i>			
Supervised practice in campus foodservice establishments <i>Dietetics students worked with chefs and kitchen staff on food preparation and cooking, using quantity foodservice equipment in campus foodservice establishments</i>		19/25 students completed 6-7 rotations	19/26 students completed 2-6 rotations
Food and nutrition students <i>Students studying food and nutrition who were not in the Coordinated Program in Dietetics</i>			
Currently in a quantity food equipment and production course			
Optional open labs <i>Specific times were scheduled for students to come to the foods lab and ask the instructor questions about the equipment, and the review equipment manuals</i>			
Equipment competency exam <i>Practical equipment exam to demonstrate competency using all the pieces of equipment</i>			
Extensive equipment training <i>A two-hour, extensive hands-on foodservice equipment training in small groups (3-4 people)</i>			
Practice lab <i>Students cooked with five pieces of equipment they felt least comfortable with after receiving the extensive equipment training</i>			
Foods lab equipment walk through <i>Instructor took students on a tour of the foods lab providing a brief introduction to the equipment, including the name and use of each piece of equipment</i>			

Completion of one quantity food equipment and production course and one management course			
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Table 2. Timeline of Intervention 3 strategies.

(Shaded box indicates which week the strategy took place.)

Week	1	2	3	4	5	6	7	8	9	10
Training										
Practice Lab										
Exam										

Table 3. Student prior experience using the quantity foodservice equipment.

Foodservice Equipment	Intervention 1 (n = 14)	Intervention 2 (n = 25)	Intervention 3 (n = 26)
Combination Oven/Steamer	21%	8%	8%
Cook Hold Smoke Oven	21%	4%	4%
Commercial Microwave	50%	24%	19%
Convection Oven	50%	20%	8%
Slicer	36%	32%	23%
Steam Jacketed Kettle	21%	12%	4%
Tilting Braising Pan	14%	8%	4%
20 Quart Mixer	43%	28%	8%
60 Quart Mixer	21%	20%	12%
Dishwasher	64%	56%	69%
Combination Microwave/Convection Oven	14%	20%	8%
Dice (Food Processor)	14%	36%	8%
Gas Range	50%	8%	12%
Salamander Broiler	14%	8%	4%
Average	31%	20%	14%

Table 4. Trends in pre-intervention knowledge, competence, comfort level, and confidence in training others among Interventions 1, 2, and 3 (Medians and Ranges).

Intervention	1	2	3	Z	p
	Pre-	Pre-	Pre-		
Knowledge	1.64 (1.93) n = 13r	1.29 (1.86) n = 25	1.14 (2.00) n = 26	-2.875	0.004 N = 64
Competence	2.00 (1.93) n = 12	1.36 (2.07) n = 25	1.14 (1.86) n = 26	-3.857	0.000 N = 63
Comfort Level	1.93 (1.71) n = 12	1.43 (2.29) n = 25	1.14 (2.14) n = 26	-2.243	0.025 N = 63
Confidence in training others	1.50 (1.29) n = 9	1.29 (3.00) n = 25	1.07 (1.71) n = 26	-2.397	0.017 N = 60

Table 5. Trends in post-intervention knowledge, competence, comfort level, and confidence in training others among Interventions 1, 2, and 3 (Medians and Ranges).

Intervention	1	2	3	Z	p
	Post-	Post-	Post-		
Knowledge	3.14 (1.64) n = 12	3.00 (2.07) n = 25	3.64 (3.00) n = 25	3.074	0.002 N = 62
Competence	3.00 (2.86) n = 13	2.79 (2.07) n = 25	3.57 (3.00) n = 25	3.414	0.001 N = 63
Comfort Level	3.04 (1.21) n = 12	2.93 (2.79) n = 25	3.64 (3.00) n = 25	2.353	0.019 N = 62
Confidence in training others	2.71 (0.93) n = 9	2.86 (2.79) n = 25	3.57 (3.00) n = 25	2.928	0.003 N = 59

Table 6. Trends in pre- to post-intervention changes among Interventions 1, 2, and 3 (Medians and Ranges).

				Z	p
	Intervention 1	Intervention 2	Intervention 3		
Knowledge	1.32 (1.86) n = 12	1.50 (1.79) n = 25	2.29 (3.00) n = 25	4.207	0.000 N = 62
Competence	1.11 (1.79) n = 12	1.36 (1.57) n = 25	2.43 (3.00) n = 25	4.943	0.000 N = 62

Comfort Level	1.04 (1.57) <i>n</i> = 12	1.21 (2.00) <i>n</i> = 25	1.93 (3.14) <i>n</i> = 25	4.070	0.000 <i>N</i> = 62
Confidence in training others	1.00 (1.29) <i>n</i> = 9	1.21 (2.79) <i>n</i> = 25	2.07 (3.07) <i>n</i> = 25	3.616	0.000 <i>N</i> = 59

Table 7. Intervention 3 student participants' reported most and least competent pieces of equipment.

Most	Median		Least	Median
Convection Oven	4		Cook Hold Smoke Oven	10
Dice	4		Steam Jacketed Kettle	10
Dishwasher	4		Gas Range	10
20 qt. mixer	5		MenuMaster	13

Table 8. Differences in knowledge, competence, comfort level, confidence among pre-, post-training, and post-exam, Friedman's Test (mean ranks).

Intervention 3	Mean rank			χ^2	df	<i>p</i>
<i>n</i> = 25	Pre-	Post-training	Post-exam			
Knowledge	1.04	2.14	2.82	41.163	2	<.0001
Competence	1.08	2.04	2.88	41.814	2	<.0001
Comfort	1.10	2.12	2.78	36.182	2	<.0001
Confidence in training others	1.14	2.08	2.78	34.202	2	<.0001

Figure 1. Trends in pre-intervention knowledge, competence, comfort level, and confidence in training others among Interventions 1, 2, and 3, Jonckheere-Terpsta boxplots.

*Significantly different from 1

†Significantly different from 2

‡Significantly different from 3

Figure 2. Trends in post-intervention knowledge, competence, comfort level, and confidence in training others among Interventions 1, 2, and 3, Jonckheere-Terpsta boxplots.

*Significantly different from 1

†Significantly different from 2

‡Significantly different from 3

Figure 3. Trends in pre- to post-intervention changes among Interventions 1, 2, and 3, Jonckheere-Terpsta boxplots.

*Significantly different from 1

†Significantly different from 2

‡Significantly different from 3

Figure 4. Agreement between actual skill from the exam and self-reported competence (skill), Bland-Altman plot.

Default Question Block

Please reflect on your knowledge, competence, and comfort level related to working with foodservice prior to beginning FCS 384/387, after completing FCS 384/387, and after completing the Coordination (CPD).

In FCS 384/387 you completed the following: equipment investigation project, etiquette dinner, N theme meal, and campus dining rotations.

This project has been certified as exempt by the University of Idaho Institutional Review Board. anonymous. Completion of the survey implies consent to participate and certifies you are at least 18 years of age.

Following completion, you will be redirected to a second survey. You will be asked to enter your receive a \$5.00 Starbucks gift card for participation in this survey.

Please indicate the pieces of equipment you had experience using prior to beginning FCS 364/367. If you used the type of equipment before (brand), you can still check the box.

☐ Alto-Sham Combination Oven/Steamer	☐ Green Steam Jacketed Kettle	☐ MenuMaster High
☐ Alto-Sham Cook Hold Smoke Oven	☐ Green Tilting Braising Pan	☐ Robot Coupe Dice
☐ Amana Microwave	☐ Hobart 20 Quart Mixer	☐ Vulcan Endurance
☐ Blodgett Convection Oven ZephraireE	☐ Hobart 60 Quart Mixer	☐ Vulcan Salamander
☐ Globe Slicer	☐ Hobart Dishwasher AM15	

Please assess **knowledge** prior to FCS 384/387, after FCS 384/387, and after completing the Coordinated Program. Please consider the type of equipment and not the specific brand.

[illegible]

[illegible][illegible]

	Please assess confident level prior to beginning the FCS 384/387 course.				Please assess confident level after completing the FCS 384/387 course.				Please assess confident level after completing the CPD.			
	Not Confident	Somewhat Confident	Confident	Highly Confident	Not Confident	Somewhat Confident	Confident	Highly Confident	Not Confident	Somewhat Confident	Confident	Highly Confident
MenuMASTER High Speed Combi Oven												
Robot Coupe Dice	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Vulcan Endurance / Wolf Challenger Range	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Vulcan Salamander	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Please rank in order of your competency, by dragging the number to the equipment name. Number 1 would be most competent using and number 14 the equipment you feel the least competent using. Please consider the specific brand.

• Alto-Sham Combination Oven/Steamer

• Alto-Sham Cook Hold Smoke Oven

• Amana Microwave

• Blodgett Convection Oven ZephairE

• Globe Slicer

• Groen Steam Jacketed Kettle

• Groen Tilting Braising Pan

• Hobart 20 Quart Mixer

• Hobart 60 Quart Mixer

• Hobart Dishwasher AM15

• MenuMASTER High Speed Combi Oven

• Robot Coupe Dice

• Vulcan Endurance / Wolf Challenger Range

• Vulcan Salamander

Please describe areas of foodservice equipment use in which you **do not** feel knowledgeable, confident, or c

Please describe foodservice experiences and resources **prior to** the FCS 384/387 course that contributed to and comfort level using foodservice equipment.

Please describe foodservice experiences and resources during your CPD senior year that contributed to your comfort level using foodservice equipment.

Please describe recommendations for equipment training for FCS 384/387 students.

Thank you for participating in this project.

Following completion, you will be redirected to a second survey. You will be asked to enter your receive a \$5.00 Starbucks gift card for participation in this survey.

All survey responses are anonymous. Your name will not be linked to the previous responses.

Intervention 2 – Retrospective Pre- and Post- Intervention Survey

Default Question Block

Please reflect on your knowledge, competence, and comfort level related to working with foodservice equipment both currently and prior to beginning FCS 384.

This project has been certified as exempt by the University of Idaho Institutional Review Board. All responses are anonymous. Completion of the survey implies consent to participate and certifies you are at least 18 years of age.

Following the survey, you will be redirected to a second survey to enter your name and receive class credit for completing the activity.

Prior to FCS 384 please check all the equipment that you have used before. If you have used the type of equipment before but from a different company (different brand), you can still check the box.

☐ Alto-Sham Combination Oven/Steamer	☐ Green Steam Jacketed Kettle	☐ MenuMaster High Speed Combi Oven
☐ Alto-Sham Cook Hold Smoke Oven	☐ Green Tilting Braising Pan	☐ Robot Coupe Dice
☐ Amana Microwave	☐ Hobart 20 Quart Mixer	☐ Vulcan Endurance / Wolf Challenger Range
☐ Blodgett Convection Oven ZephraireE	☐ Hobart 60 Quart Mixer	☐ Vulcan Salamander
☐ Globe Slicer	☐ Hobart Dishwasher AM15	

Please assess **knowledge** prior to FCS 384 and after the competency exam. Please consider the type of equipment and not the specific brand.

[illegible]

	Please assess knowledge prior to beginning the FCS 384 course.				Please assess knowledge after completing the equipment competency exam.			
	Not knowledgeable	Somewhat knowledgeable	Knowledgeable	Highly knowledgeable	Not knowledgeable	Somewhat knowledgeable	Knowledgeable	Highly knowledgeable
Robot Coupe Dice								
Vulcan Endurance / Wolf Challenger Range	☐	☐	☐	☐	☐	☐	☐	☐
Vulcan Salamander	☐	☐	☐	☐	☐	☐	☐	☐

Please assess competence (skill level) prior to FCS 384 and after the competency exam. Please consider the type of equipment and not the specific brand.

	Please assess competence prior to beginning the FCS 384 course.				Please assess competence after completing the equipment competency exam.			
	Not Competent	Somewhat Competent	Competent	Highly Competent	Not Competent	Somewhat Competent	Competent	Highly Competent
Alto-Sham Combination Oven/Steamer	☐	☐	☐	☐	☐	☐	☐	☐
Alto-Sham Cook Hold Smoke Oven	☐	☐	☐	☐	☐	☐	☐	☐
Amana Microwave	☐	☐	☐	☐	☐	☐	☐	☐
Biodgett Convection Oven	☐	☐	☐	☐	☐	☐	☐	☐
ZephairE	☐	☐	☐	☐	☐	☐	☐	☐
Globe Slicer	☐	☐	☐	☐	☐	☐	☐	☐
Groen Steam Jacketed Kettle	☐	☐	☐	☐	☐	☐	☐	☐
Groen Tilting Braising Pan	☐	☐	☐	☐	☐	☐	☐	☐
Hobart 20 Quart Mixer	☐	☐	☐	☐	☐	☐	☐	☐
Hobart 60 Quart Mixer	☐	☐	☐	☐	☐	☐	☐	☐
Hobart Dishwasher AM15	☐	☐	☐	☐	☐	☐	☐	☐
MenuMaster High Speed Combi Oven	☐	☐	☐	☐	☐	☐	☐	☐
Robot Coupe Dice	☐	☐	☐	☐	☐	☐	☐	☐
Vulcan Endurance / Wolf Challenger Range	☐	☐	☐	☐	☐	☐	☐	☐
Vulcan Salamander	☐	☐	☐	☐	☐	☐	☐	☐

Please assess comfort level in using the equipment prior to FCS 384 and after the competency exam. Please consider the type of equipment and not the specific brand.

	Please assess comfort level prior to beginning the FCS 384 course.				Please assess comfort level after completing the equipment competency exam.			
	Not Comfortable	Somewhat Comfortable	Comfortable	Highly Comfortable	Not Comfortable	Somewhat Comfortable	Comfortable	Highly Comfortable

	Please assess confident level prior to beginning the FCS 384 course.				Please assess confident level after completing the equipment competency exam.			
	Not Confident	Somewhat Confident	Confident	Highly Confident	Not Confident	Somewhat Confident	Confident	Highly Confident
Hobart 20 Quart Mixer	☐	☐	☐	☐	☐	☐	☐	☐
Hobart 60 Quart Mixer	☐	☐	☐	☐	☐	☐	☐	☐
Hobart Dishwasher AM15	☐	☐	☐	☐	☐	☐	☐	☐
MenuMaster High Speed Combi Oven	☐	☐	☐	☐	☐	☐	☐	☐
Robot Coupe Dice	☐	☐	☐	☐	☐	☐	☐	☐
Vulcan Endurance / Wolf Challenger Range	☐	☐	☐	☐	☐	☐	☐	☐
Vulcan Salamander	☐	☐	☐	☐	☐	☐	☐	☐

Please rank in order of your competency, by dragging the number to the equipment name. Number 1 would be the equipment you feel the most competent using and number 14 the equipment you feel the least competent using. Please consider the type of equipment and not the specific brand.

- Alto-Sham Combination Oven/Steamer
- Alto-Sham Cook Hold Smoke Oven
- Amana Microwave
- Blodgett Convection Oven ZephairE
- Globe Slicer
- Groen Steam Jacketed Kettle
- Groen Tilting Braising Pan
- Hobart 20 Quart Mixer
- Hobart 60 Quart Mixer
- Hobart Dishwasher AM15
- MenuMaster High Speed Combi Oven
- Robot Coupe Dice
- Vulcan Endurance / Wolf Challenger Range
- Vulcan Salamander

Please describe areas of foodservice equipment use in which you do not feel knowledgeable, confident, or comfortable.

Please describe food service experiences and resources **prior to** the FCS 384 course that contributed to your knowledge, competence and comfort level using foodservice equipment.

Please describe aspects **within the** equipment competency exam that you found helpful.

After completing the equipment competency exam please answer the following.

	Please assess the following on the exam.			
	Highly Disagree	Disagree	Agree	Highly Agree
The entire exam process was clear.	☐	☐	☐	☐
Exam explanation document was clear in the instructions, and understandable.	☐	☐	☐	☐
Exam written component document was clear, and understandable.	☐	☐	☐	☐
Exam checklist was a good indicator of completing and using each piece of equipment.	☐	☐	☐	☐
The time allotted for the exam was appropriate.	☐	☐	☐	☐

Please comment on your experience of taking the equipment competency exam.

Please describe recommendations for equipment training for future FCS 384 students.

Please comment on recommendations and changes for future equipment competency exam testing.

Thank you for participating in this project. Following completion, you will be redirected to a second survey. You will be asked to enter your name and e-mail address to receive FCS 384 class credit for participation in this activity. All survey responses are anonymous. Your name will not be linked to the previous responses.

Intervention 3 – Post- Practice Lab and Training Survey

Default Question Block

Please reflect on your current knowledge, competence, and comfort level related to working with foodservice equipment.

This project has been certified as exempt by the University of Idaho Institutional Review Board. All responses are anonymous. Completion of the survey implies consent to participate and certifies you are at least 18 years of age.

Following the survey, you will be redirected to a second survey to enter your name and receive class credit for completing the activity.

Please assess knowledge after completing the equipment training and practice lab. Please consider the type of equipment and not the specific brand.

	Please asses knowledge after completing the equipment training and practice lab.			
	Not knowledgeable	Somewhat knowledgeable	Knowledgeable	Highly knowledgeable
Alto-Sham Combination Oven/Steamer	☐	☐	☐	☐
Alto-Sham Cook Hold Smoke Oven	☐	☐	☐	☐
Amana Microwave	☐	☐	☐	☐
Blodgett Convection Oven	☐	☐	☐	☐
ZephairE	☐	☐	☐	☐
Globe Slicer	☐	☐	☐	☐
Groen Steam Jacketed Kettle	☐	☐	☐	☐
Groen Tilting Braising Pan	☐	☐	☐	☐
Hobart 20 Quart Mixer	☐	☐	☐	☐
Hobart 60 Quart Mixer	☐	☐	☐	☐
Hobart Dishwasher AM15	☐	☐	☐	☐
MenuMaster High Speed Combi Oven	☐	☐	☐	☐
Robot Coupe Dice	☐	☐	☐	☐
Vulcan Endurance / Wolf Challenger Range	☐	☐	☐	☐
Vulcan Salamander	☐	☐	☐	☐

Please assess competence (skill level) after completing the equipment training and practice lab.. Please consider the type of equipment and not the specific brand.

	Please asses competence after completing the equipment training and practice lab.			
	Not Competent	Somewhat Competent	Competent	Highly Competent
Alto-Sham Combination Over/Steamer	☐	☐	☐	☐
Alto-Sham Cook Hold Smoke Oven	☐	☐	☐	☐
Amana Microwave	☐	☐	☐	☐
Blodgett Convection Oven ZephairE	☐	☐	☐	☐
Globe Slicer	☐	☐	☐	☐
Groen Steam Jacketed Kettle	☐	☐	☐	☐
Groen Tilting Braising Pan	☐	☐	☐	☐
Hobart 20 Quart Mixer	☐	☐	☐	☐
Hobart 60 Quart Mixer	☐	☐	☐	☐
Hobart Dishwasher AM15	☐	☐	☐	☐
MenuMaster High Speed Combi Oven	☐	☐	☐	☐
Robot Coupe Dice	☐	☐	☐	☐
Vulcan Endurance / Wolf Challenger Range	☐	☐	☐	☐
Vulcan Salamander	☐	☐	☐	☐

Please assess comfort level in using the equipment after completing the equipment training and practice lab. Please consider the type of equipment and not the specific brand.

	Please asses comfort level after completing the equipment training and practice lab.			
	Not Comfortable	Somewhat Comfortable	Comfortable	Highly Comfortable
Alto-Sham Combination Oven/Steamer	☐	☐	☐	☐
Alto-Sham Cook Hold Smoke Oven	☐	☐	☐	☐
Amana Microwave	☐	☐	☐	☐
Blodgett Convection Oven ZephairE	☐	☐	☐	☐
Globe Slicer	☐	☐	☐	☐
Groen Steam Jacketed Kettle	☐	☐	☐	☐
Groen Tilting Braising Pan	☐	☐	☐	☐
Hobart 20 Quart Mixer	☐	☐	☐	☐
Hobart 60 Quart Mixer	☐	☐	☐	☐
Hobart Dishwasher AM15	☐	☐	☐	☐
MenuMaster High Speed Combi Oven	☐	☐	☐	☐
Robot Coupe Dice	☐	☐	☐	☐
Vulcan Endurance / Wolf Challenger Range	☐	☐	☐	☐
Vulcan Salamander	☐	☐	☐	☐

Please assess confidence level in being able to train someone on the equipment after completing the equipment training and practice lab. Please consider the type of equipment and not the specific brand.

	Please asses confident level after completing the equipment training and practice lab.			
	Not Confident	Somewhat Confident	Confident	Highly Confident
Alto-Sham Combination Oven/Steamer	☐	☐	☐	☐
Alto-Sham Cook Hold Smoke Oven	☐	☐	☐	☐
Amana Microwave	☐	☐	☐	☐
Blodgett Convection Oven ZephairE	☐	☐	☐	☐
Globe Slicer	☐	☐	☐	☐
Groen Steam Jacketed Kettle	☐	☐	☐	☐
Groen Tilting Braising Pan	☐	☐	☐	☐
Hobart 20 Quart Mixer	☐	☐	☐	☐
Hobart 60 Quart Mixer	☐	☐	☐	☐
Hobart Dishwasher AM15	☐	☐	☐	☐
MenuMaster High Speed Combi Oven	☐	☐	☐	☐
Robot Coupe Dice	☐	☐	☐	☐
Vulcan Endurance / Wolf Challenger Range	☐	☐	☐	☐
Vulcan Salamander	☐	☐	☐	☐

Please rank in order of your competency, by dragging the number to the equipment name. Number 1 would be the equipment you feel the most competent using and number 14 the equipment you feel the least competent using. Please consider the type of equipment and

not the specific brand.

- Alto-Sham Combination Oven/Steamer
- Alto-Sham Cook Hold Smoke Oven
- Amana Microwave
- Blodgett Convection Oven ZephairE
- Globe Slicer
- Groen Steam Jacketed Kettle
- Groen Tilting Braising Pan
- Hobart 20 Quart Mixer
- Hobart 60 Quart Mixer
- Hobart Dishwasher AM15
- MenuMaster High Speed Combi Oven
- Robot Coupe Dice
- Vulcan Endurance / Wolf Challenger Range
- Vulcan Salamander

Please describe areas of foodservice equipment use in which you do not feel knowledgeable, confident, or comfortable.

Please describe aspects within the equipment training that you found helpful.

Please describe aspects within the equipment practice lab that you found helpful.

After completing the equipment training and practice lab please answer the following.

	Please assess the following.			
	Highly Disagree	Disagree	Agree	Highly Agree
The training was detailed and clear.	☐	☐	☐	☐
Small size training groups benefited my learning of the equipment.	☐	☐	☐	☐
The training note sheet was helpful during the training and practice lab.	☐	☐	☐	☐
The time allotted for the training was appropriate.	☐	☐	☐	☐
The time allotted for the practice lab was appropriate.	☐	☐	☐	☐

Please comment on your equipment training experience.

Please describe recommendations and changes for the equipment practice labs for future FCS 384 students.

Thank you for participating in this project. Following completion, you will be redirected to a second survey. You will be asked to enter your name and e-mail address to receive FCS 384 class credit for participation in this activity. All survey responses are anonymous. Your name will not be linked to the previous responses.

Intervention 3 – Retrospective Pre- and Post- Intervention Survey

Default Question Block

Please reflect on your knowledge, competence, and comfort level related to working with foodservice equipment both currently and prior to beginning FCS 384.

This project has been certified as exempt by the University of Idaho Institutional Review Board. All responses are anonymous. Completion of the survey implies consent to participate and certifies you are at least 18 years of age.

Following the survey, you will be redirected to a second survey to enter your name and receive class credit for completing the activity.

Prior to FCS 384 please check all the equipment that you have used before. If you have used the type of equipment before but from a different company (different brand), you can still check the box.

☐ Alto-Sham Combination Oven/Steamer	☐ Groen Steam Jacketed Kettle	☐ MenuMaster High Speed Combi Oven
☐ Alto-Sham Cook Hold Smoke Oven	☐ Groen Tilting Braising Pan	☐ Robot Coupe Dice
☐ Amana Microwave	☐ Hobart 20 Quart Mixer	☐ Vulcan Endurance / Wolf Challenger Range
☐ Blodgett Convection Oven ZephairE	☐ Hobart 60 Quart Mixer	☐ Vulcan Salamander
☐ Globe Slicer	☐ Hobart Dishwasher AM15	

Please assess knowledge prior to FCS 384 and after the competency exam. Please consider the type of equipment and not the specific brand.

	Please asses knowledge prior to beginning the FCS 384 course.				Please assess knowledge after completing the equipment competency exam.			
	Not knowledgeable	Somewhat knowledgeable	Knowledgeable	Highly knowledgeable	Not knowledgeable	Somewhat knowledgeable	Knowledgeable	Highly knowledgeable
Alto-Sham Combination Oven/Steamer	☐	☐	☐	☐	☐	☐	☐	☐
Alto-Sham Cook Hold Smoke Oven	☐	☐	☐	☐	☐	☐	☐	☐
Amana Microwave	☐	☐	☐	☐	☐	☐	☐	☐
Blodgett Convection Oven	☐	☐	☐	☐	☐	☐	☐	☐
ZephairE	☐	☐	☐	☐	☐	☐	☐	☐
Globe Slicer	☐	☐	☐	☐	☐	☐	☐	☐
Groen Steam Jacketed Kettle	☐	☐	☐	☐	☐	☐	☐	☐
Groen Tilting Braising Pan	☐	☐	☐	☐	☐	☐	☐	☐
Hobart 20 Quart Mixer	☐	☐	☐	☐	☐	☐	☐	☐
Hobart 60 Quart Mixer	☐	☐	☐	☐	☐	☐	☐	☐
Hobart Dishwasher AM15	☐	☐	☐	☐	☐	☐	☐	☐
Merumaster High Speed Combi Oven	☐	☐	☐	☐	☐	☐	☐	☐
Robot Coupe Dice	☐	☐	☐	☐	☐	☐	☐	☐
Vulcan Endurance / Wolf Challenger Range	☐	☐	☐	☐	☐	☐	☐	☐
Vulcan Salamander	☐	☐	☐	☐	☐	☐	☐	☐

Please assess competence (skill level) prior to FCS 384 and after the competency exam. Please consider the type of equipment and not the specific brand.

	Please assess competence prior to beginning the FCS 384 course.				Please assess competence after completing the equipment competency exam.			
	Not Competent	Somewhat Competent	Competent	Highly Competent	Not Competent	Somewhat Competent	Competent	Highly Competent
Alto-Sham Combination Oven/Steamer	☐	☐	☐	☐	☐	☐	☐	☐
Alto-Sham Cook Hold Smoke Oven	☐	☐	☐	☐	☐	☐	☐	☐
Amana Microwave	☐	☐	☐	☐	☐	☐	☐	☐
Blodgett Convection Oven ZephairE	☐	☐	☐	☐	☐	☐	☐	☐
Globe Slicer	☐	☐	☐	☐	☐	☐	☐	☐
Groen Steam Jacketed Kettle	☐	☐	☐	☐	☐	☐	☐	☐
Groen Tilting Braising Pan	☐	☐	☐	☐	☐	☐	☐	☐
Hobart 20 Quart Mixer	☐	☐	☐	☐	☐	☐	☐	☐
Hobart 60 Quart Mixer	☐	☐	☐	☐	☐	☐	☐	☐
Hobart Dishwasher AM15	☐	☐	☐	☐	☐	☐	☐	☐
MenuMaster High Speed Combi Oven	☐	☐	☐	☐	☐	☐	☐	☐
Robot Coupe Dice	☐	☐	☐	☐	☐	☐	☐	☐
Vulcan Endurance / Wolf Challenger Range	☐	☐	☐	☐	☐	☐	☐	☐
Vulcan Salamander	☐	☐	☐	☐	☐	☐	☐	☐

Please assess comfort level in using the equipment prior to FCS 384 and after the competency exam. Please consider the type of equipment and not the specific brand.

	Please assess comfort level prior to beginning the FCS 384 course.				Please assess comfort level after completing the equipment competency exam.			
	Not Comfortable	Somewhat Comfortable	Comfortable	Highly Comfortable	Not Comfortable	Somewhat Comfortable	Comfortable	Highly Comfortable
Alto-Sham Combination Oven/Steamer	☐	☐	☐	☐	☐	☐	☐	☐
Alto-Sham Cook Hold Smoke Oven	☐	☐	☐	☐	☐	☐	☐	☐
Amana Microwave	☐	☐	☐	☐	☐	☐	☐	☐
Blodgett Convection Oven	☐	☐	☐	☐	☐	☐	☐	☐
ZephairE	☐	☐	☐	☐	☐	☐	☐	☐
Globe Slicer	☐	☐	☐	☐	☐	☐	☐	☐
Groen Steam Jacketed Kettle	☐	☐	☐	☐	☐	☐	☐	☐
Groen Tilting Braising Pan	☐	☐	☐	☐	☐	☐	☐	☐
Hobart 20 Quart Mixer	☐	☐	☐	☐	☐	☐	☐	☐
Hobart 60 Quart Mixer	☐	☐	☐	☐	☐	☐	☐	☐
Hobart Dishwasher AM15	☐	☐	☐	☐	☐	☐	☐	☐
MenuMaster High Speed Combi Oven	☐	☐	☐	☐	☐	☐	☐	☐
Robot Coupe Dice	☐	☐	☐	☐	☐	☐	☐	☐
Vulcan Endurance / Wolf Challenger Range	☐	☐	☐	☐	☐	☐	☐	☐
Vulcan Salamander	☐	☐	☐	☐	☐	☐	☐	☐

Please assess confidence level in being able to train someone on the equipment prior to FCS 384 and after the competency exam. Please consider the type of equipment and not the specific brand.

	Please assess confident level prior to beginning the FCS 384 course.				Please assess confident level after completing the equipment competency exam.			
	Not Confident	Somewhat Confident	Confident	Highly Confident	Not Confident	Somewhat Confident	Confident	Highly Confident
Alto-Sham Combination Oven/Steamer	☐	☐	☐	☐	☐	☐	☐	☐
Alto-Sham Cook Hold Smoke Oven	☐	☐	☐	☐	☐	☐	☐	☐
Amana Microwave	☐	☐	☐	☐	☐	☐	☐	☐
Blodgett Convection Oven ZephairE	☐	☐	☐	☐	☐	☐	☐	☐
Globe Slicer	☐	☐	☐	☐	☐	☐	☐	☐
Groen Steam Jacketed Kettle	☐	☐	☐	☐	☐	☐	☐	☐
Groen Tilting Braising Pan	☐	☐	☐	☐	☐	☐	☐	☐
Hobart 20 Quart Mixer	☐	☐	☐	☐	☐	☐	☐	☐
Hobart 60 Quart Mixer	☐	☐	☐	☐	☐	☐	☐	☐
Hobart Dishwasher AM15	☐	☐	☐	☐	☐	☐	☐	☐
MenuMaster High Speed Combi Oven	☐	☐	☐	☐	☐	☐	☐	☐
Robot Coupe Dice	☐	☐	☐	☐	☐	☐	☐	☐
Vulcan Endurance / Wolf Challenger Range	☐	☐	☐	☐	☐	☐	☐	☐
Vulcan Salamander	☐	☐	☐	☐	☐	☐	☐	☐

Please rank in order of your competency, by dragging the number to the equipment name. Number 1 would be the equipment you feel the most competent using and number 14 the equipment you feel the least competent using. Please consider the type of equipment and not the specific brand.

- Alto-Sham Combination Oven/Steamer
- Alto-Sham Cook Hold Smoke Oven
- Amana Microwave
- Blodgett Convection Oven ZephairE
- Globe Slicer
- Groen Steam Jacketed Kettle
- Groen Tilting Braising Pan
- Hobart 20 Quart Mixer
- Hobart 60 Quart Mixer

- Hobart Dishwasher AM15
- MenuMaster High Speed Combi Oven
- Robot Coupe Dice
- Vulcan Endurance / Wolf Challenger Range
- Vulcan Salamander

Please describe areas of foodservice equipment use in which you do not feel knowledgeable, confident, or comfortable.

Please describe food service experiences and resources prior to the FCS 384 course that contributed to your knowledge, competence and comfort level using foodservice equipment.

Please describe aspects within the equipment competency exam that you found helpful.

After completing the equipment competency exam please answer the following.

	Please assess the following on the exam.			
	Highly Disagree	Disagree	Agree	Highly Agree
The entire exam process was clear.	☐	☐	☐	☐
Exam explanation document was clear in the instructions, and understandable.	☐	☐	☐	☐
Exam written component document was clear, and understandable.	☐	☐	☐	☐
The time allotted for the exam was appropriate.	☐	☐	☐	☐

Please comment on your experience of taking the equipment competency exam.

Please describe recommendations for equipment training for future FCS 384 students.

Please comment on recommendations and changes for future equipment competency exam testing.