

Journal of Human Sciences and Extension

Manuscript 1483

Full Issue, Volume 11, Number 2

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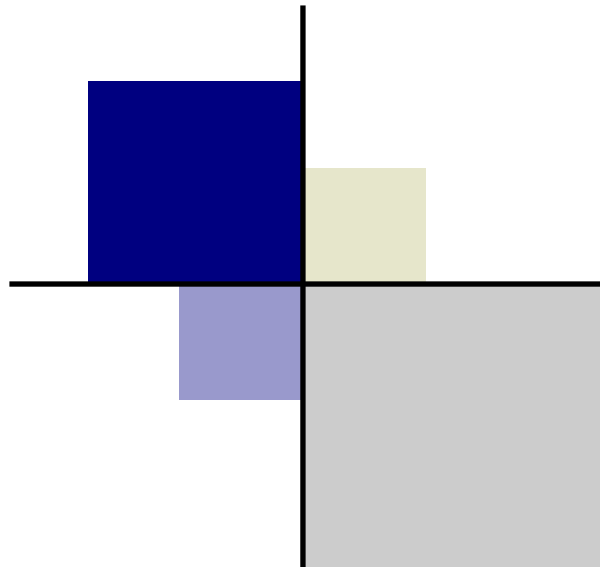
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Journal of Human Sciences and Extension

Volume 11, Number 2

2023

ISSN 2325-5226



Donna J. Peterson and Scott R. Cummings, Co-Editors

Journal of Human Sciences and Extension
Volume 11, Number 2, 2023
ISSN 2325-5226

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Predicting COVID-19 Risk Information-Seeking Behaviors in Relation to Food Purchasing Concerns

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COVID-19 drastically altered the way consumers shopped for food as they had to adhere to recommendations for social distancing. However, the public has been divided across political parties in their assessment of the severity of COVID-19 and must filter through misinformation related to the pandemic to make informed choices for personal safety. Therefore, the purpose of this study was to explore the influences on Oklahoma consumers' risk information-seeking behaviors about COVID-19 within the context of risk perceptions while shopping for food. The Risk Information Seek and Processing (RISP) model and cultural cognition provided the framework for this study. An online instrument was distributed to Oklahoma consumers to collect quantitative data (n = 410). Respondents reported they were only slightly concerned while making food purchases and possessed moderately high knowledge about COVID-19. They also reported needing moderately high knowledge to make judgments about the issue. Additionally, the respondents engaged more often in systematic processing of COVID-19 information compared to heuristic processing, but neither agreed nor disagreed that they engaged in active information-seeking behaviors. The findings from this research provide Extension agents and agricultural communicators guidance for creating and researching risk communication during a pandemic in relation to food purchasing behaviors.

Keywords: COVID-19, risk communication, information seeking and processing, food purchases, pandemic

“For the first time in a generation, Americans began spending more money at the supermarket than at places where someone else made the food” (Severson, 2020, para. 2). This change in food purchasing patterns was the direct result of the 2020 SARS-CoV-2 pandemic, otherwise known as COVID-19 or the novel coronavirus (Yuen et al., 2020). This pandemic caused widespread shutdowns across the United States as Americans were encouraged to practice social distancing to prevent the transmission of COVID-19 (Centers for Disease Control and Prevention [CDC],

2020). Specifically, people were encouraged to stay at least six feet apart while wearing face masks and to limit contact with people outside their houses to reduce the spread of the virus (CDC, 2020). Even with these recommendations in place, the COVID-19 virus infected at least seven million Americans and took the lives of more than 200,000 across the nation by October 2020 (World Health Organization [WHO], 2020). By spring 2021, COVID-19 vaccines were broadly distributed across the United States, and social distancing restrictions and mask mandates were lifted across the country (“See Reopening Plans,” 2021). However, only 50% of the United States population was fully vaccinated by August 2021 (CDC, 2021b), and the total number of COVID-19 infections had increased to 30 million cases with more than 600,000 deaths (CDC, 2021c). Because of the pandemic’s broad reach, Extension specialists and agricultural and science communicators need to understand Americans’ risk perceptions and risk information-seeking behaviors related to COVID-19. Exploring these risk perceptions within the context of food purchasing behaviors is particularly interesting because food purchasing behaviors were changing even before the pandemic (Holcomb et al., 2021), so the questions and concerns people have about where they purchase their food have likely evolved. Understanding risk-information-seeking behaviors related to food purchasing behaviors during the ongoing pandemic can lead to education campaigns and Extension programming in the future to help disseminate accurate information to the public during a public health crisis.

Because COVID-19 spread through respiratory water droplets and aerosol, the CDC (2021a) provided guidelines stating indoor activities were riskier than outdoor activities, and the likelihood of transmission increased the more time people spent around individuals who may have been infected. These guidelines for social distancing caused governors and mayors across the country to issue shelter-in-place orders that shut down businesses and encouraged people to stay home during March and April 2020 (Miller, 2020). However, essential businesses could stay open, which included healthcare, public utilities, food production and delivery services, and grocery stores (Chabon et al., 2020). The closure of indoor restaurants and bars, coupled with the threat of COVID-19, altered the way Americans shopped for food, even six months after the start of the pandemic (Severson, 2020). These food purchasing behavioral changes included fewer trips to the stores, more online grocery purchases, and increased interest in purchasing locally produced food (Severson, 2020). Even though online grocery shopping became more common during the pandemic, in-store shopping for food remained the mode of shopping for most Americans (Holcomb et al., 2021).

As government restrictions on businesses lifted and the country reopened after the onset of the pandemic, consumers needed to start making decisions for themselves about how they practiced personal protection against COVID-19. Despite scientific consensus on both the severity of COVID-19 and proper preventative measures (Mayo Clinic, 2020), there was a sharp divide between political groups regarding the severity of COVID-19 and steps individuals should take to control the spread of the virus (Pew Research Center, 2020a). While most Republicans and Democrats identified COVID-19 as a threat to the economy, Democrats viewed the virus as a

public health threat by more than 40 percentage points compared to Republicans as of May 2020 (Pew Research Center, 2020a). By June 2020, most Republicans believed the worst part of the pandemic was over, while 73% of Democrats believed the worst was still to come (Pew Research Center, 2020b).

Along with this vast disparity in COVID-19 concerns across political parties, there has been a barrage of misinformation and conflicting information related to the pandemic. Joszt (2020) described this occurrence as an infodemic or “an overabundance of information—some accurate and some not—that makes it hard for people to find trustworthy sources and reliable guidance when they need it” (para. 3). Researchers have identified more than 2,000 cases of misinformation related to COVID-19 across 87 countries (Joszt, 2020). One piece of misinformation led people to ingest highly concentrated alcohol, causing 800 deaths and nearly 6,000 hospitalizations across the globe (Joszt, 2020), thus demonstrating the severe implications of the spread of misinformation.

Extension agents have indicated the spread of misinformation, complexity of scientific issues, and presence of political agendas were critical barriers to their ability to communicate about contentious topics to stakeholders (Leal et al., 2020), and COVID-19 is a perfect representation of all these issues (Joszt, 2020; Pew Research Center, 2020a). Therefore, understanding how consumers seek and process risk information related to the COVID-19 pandemic will be critical in aiding Extension specialists to develop public health campaigns and programming related to the pandemic or future public health crises in an effort to combat these communication barriers. For example, the importance of effective risk communication could be seen as vaccine hesitancy in the United States contributed to the spread of the delta variant of COVID-19 over the summer of 2021 (Mandavilli, 2021). The threat of COVID-19 will decrease eventually, but it will not be the last pandemic in an increasingly global society. Pandemic risk was documented before COVID-19, so there is a need to learn from the COVID-19 pandemic to avoid similar consequences in the future (National Academy of Sciences, 2016). Therefore, the purpose of this research was to explore the influences on consumers’ risk information-seeking behaviors related to COVID-19 transmission and food purchasing behaviors.

Theoretical Framework

The Risk Information Seeking and Processing (RISP) model (Griffin et al., 1999) and cultural cognition (Douglas, 1970, 1982; Kahan, 2012) provided the theoretical framework for this study. The RISP model was initially developed to understand how people respond to information about risk because researchers understood that the daily processing of information can be biased, incomplete, and without effort (Griffin et al., 1999). The model builds on the heuristic-systematic model (HSM; Eagly & Chaiken, 1993) and Ajzen’s (1991) theory of planned behavior to account for social, psychological, and communication factors to predict risk information-seeking and information-processing behaviors.

The model proposes that an individual's characteristics, including demographics and political ideology, will influence their perceptions of risks (Griffin et al., 1999). The model assumed that perceived risks would trigger individuals to assess how much they knew about the topic being communicated and their current knowledge (in)sufficiency or how much they needed to know about the topic to make proper risk judgments. This gap between what people know and what they think they need to know is called information insufficiency, and it is a driving factor for an individual's desire to seek information about the topic (Griffin et al., 1999). In addition to seeking information related to the topic, the model examines the influence on how the information is processed. The two processing routes are systematic (e.g., active, engaged, and thoughtful) and heuristic (e.g., passive, superficial, and habitual). The model also accounts for past hazard experiences, informational subjective norms, relevant channel beliefs, and perceived information-gathering capacity to predict information-seeking and processing behaviors (Griffin et al., 1999).

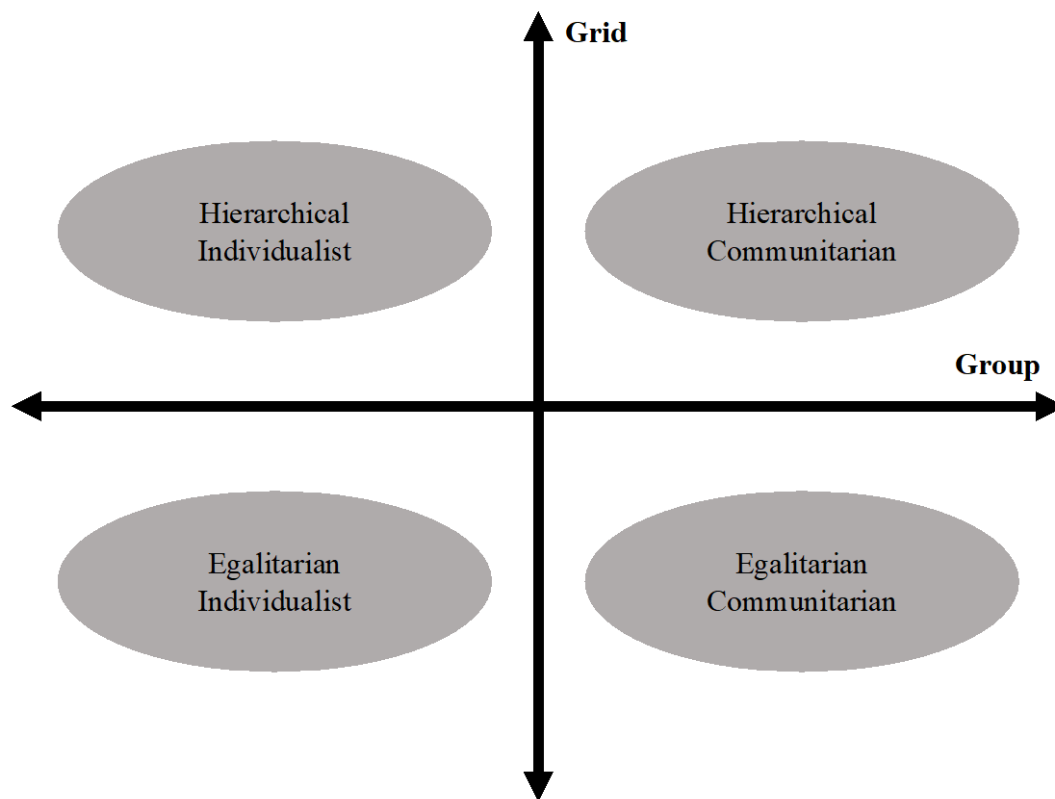
Due to the complex nature of the RISP model, researchers often choose to focus on specific variables of interest from the model (Cross et al., 2018; Hmielowski et al., 2018; Lu et al., 2020; Yang et al., 2019). This study identified individual characteristics, risk perceptions, knowledge (in)sufficiency, current knowledge, heuristic processing, systematic processing, and information-seeking behaviors as the variables of interest. Risk communication researchers have applied this model across multiple contexts and found it performed the best when research subjects identified the risk context to be both important and familiar (Yang et al., 2013). Within the context of smoke emission from prescribed wildfires, Rose et al. (2017) concluded that risk-seeking behaviors were influenced by information insufficiency, and information insufficiency was influenced by concern related to smoke emissions. Similarly, Lu et al. (2020) identified information insufficiency as a predictor of risk-seeking information related to vaccinations, along with emotional responses to vaccinations.

Griffin et al. (2004) concluded personal characteristics like age, race, income, and education could influence risk information-processing and seeking behaviors. Additionally, Yang et al. (2014) found political ideology an important variable in the model, with Republican participants less likely to process climate change systematically compared to Democrat participants. Researchers commonly used political ideology when testing the RISP model, which scholars have critiqued due to the unidimensional approach to ideology (Feldman & Johnston, 2014; Jost et al., 2009). However, cultural cognition outlines two underlying worldviews that influence ideology (Kahan, 2012), which Hmielowski et al. (2018) proposed was an appropriate alternative to a unidimensional political ideology measure.

The cultural worldviews described in cultural cognition included group (i.e., individualist to communitarian) and grid (i.e., egalitarian to hierarchy; Douglas, 1970, 1982; Kahan, 2012). People who score high on the grid scale believe there should be role differentiation in society (i.e., hierarchy), which implies duties, offices, and entitlements should be distributed based on

social classification (e.g., gender, age, race). Low-scoring individuals on the grid scale believe that social classification should be accessible by all (i.e., egalitarian; Kahan, 2012). For the group scale, high-scoring individuals have a communitarian worldview where they believe people depend on one another for success; therefore, the needs of the community should be met to help reach those goals. A low score on the group scale is indicative of an individualist worldview, where an individual meets their goals alone without assistance from the community (Kahan, 2012). These group and grid variables interact to form four categories of worldviews: hierarchical individualist, hierarchical communitarian, egalitarian individualist, and egalitarian communitarian (see Figure 1). These groups respond to risk information differently. For example, hierarchical individualists have been found to be dismissive of environmental and technology risks (Kahan, 2012).

Figure 1. Cultural Cognition Categories



Note. Figure adapted from “Cultural Cognition as a Conception of the Cultural Theory of Risk,” by D. M. Kahan, 2012. In *Handbook of Risk Theory: Epistemology, Decision Theory, Ethics, and Social Implications of Risk*. Springer.

Hmielowski et al. (2018) integrated these variables into the RISP model for a study related to water quality and determined that individuals with high group and low grid scores (i.e., egalitarian communitarians) perceived greater risk. Additionally, higher levels of risk perception lead to increased information-seeking behaviors and systematic processing but lower heuristic

processing (Hmielowski et al., 2018). Hmielowski et al. (2018) also found a positive relationship between systematic processing and risk information-seeking behaviors and a negative relationship between heuristic processing and risk information-seeking behaviors.

To understand the influences on consumers' risk information-seeking behaviors for COVID-19 transmission, concepts from the RISP model and cultural cognition theory were used to guide this research. Personal characteristics, including demographics and cultural cognition, along with risk perception, knowledge (in)sufficiency, current knowledge, heuristic processing, systematic processing, and information-seeking behaviors were explored in this study.

Purpose & Objectives

The purpose of this research was to explore the influences on Oklahoma consumers' risk information-seeking behaviors related to COVID-19 transmission. This research explored risk perception within the context of food-purchasing behaviors during the COVID-19 pandemic to help agricultural communicators develop appropriate risk communication messaging and campaigns. The following objectives guided this study:

1. Describe Oklahoma consumers' cultural cognition.
2. Describe Oklahoma consumers' risk perceptions related to COVID-19 and food-purchasing behaviors.
3. Describe Oklahoma consumers' knowledge and knowledge (in)sufficiency related to COVID-19.
4. Describe Oklahoma consumers' information-seeking and processing behaviors related to COVID-19.
5. Identify the influence of demographics, cultural cognition, and RISP variables (i.e., knowledge, knowledge (in)sufficiency, risk perceptions, heuristic processing, systematic processing) on Oklahoma consumers' information-seeking behaviors related to COVID-19.

Methods

Quantitative methods were used to fulfill the purpose of this study. An online questionnaire was distributed in July and August of 2020 via the survey company Qualtrics to collect the data. The questionnaire consisted of four sections of questions about local food perceptions and food-buying behaviors. One of the sections consisted of questions related to COVID-19, which are reported in this paper. Oklahoma consumers were the target population for this research, and all responses were kept anonymous to encourage honest responses. Data collection began the week after the state's governor contracted COVID-19, and the state experienced a recent influx in

COVID-19 cases (LaCroix, 2020; Wamsley, 2020). During 2020, people in Oklahoma shopped for groceries in person, mostly at Walmart Supercenters (Holcomb et al., 2021). It should also be noted that approximately 15% of the state's households live with food insecurity, which is higher than the national average (America's Health Rankings, 2022). Oklahoma was also of particular interest for this study because it had the sixth-highest death rate from COVID-19 in the country (Elflein, 2022), thus demonstrating the severe impact of COVID-19 across the state.

Quota sampling, a form of non-probability sampling, was used to help increase the generalizability of the findings to overcome the limitations of probability sampling's increasing coverage issues and poor response rates (Baker et al., 2013; Dillman et al., 2014). Filter questions were used at the beginning of the instrument to ensure respondents matched demographic quotas for gender, Hispanic/Latino status, and race based on 2019 U.S. Census estimates for Oklahoma (U.S. Census Bureau, 2019). The quotas had to be adjusted due to issues recruiting respondents who were American Indian or Alaska Native, so that group is underrepresented in the study, which is a sampling limitation. There were 410 complete and usable responses ($n = 410$). A description of the respondents' demographics and associated Oklahoma quotas has been included in Table 1.

Table 1. Quota Sample and Population Demographics

	Sample ($n = 410$)	Oklahoma Population
	%	%
Gender		
Male	48.7	49.5
Female	51.1	50.5
Hispanic/Latino	10.7	11.1
Race/Ethnicity		
White alone	74.7	74.0
Black or African American alone	7.5	7.8
Asian alone	6.8	2.4
American Indian or Alaskan Native	1.9	9.4
Two or More Races	2.8	6.3
Other	6.1	Other

In addition to the quotas presented in Table 1, respondents were asked about their education, income, and if they lived with a child under the age of 18. Approximately 6.3% of the respondents had less than a high school degree/GED, 29.0% had a high school degree/GED, 26.3% had some college experience with no degree, 7.8% had a 2-year degree, 19.7% had a 4-year degree, and 10.9% had a graduate/professional degree. For total household income, 35.5% made less than \$25,000, 27.7% made \$25,000 to \$49,999, 24.6% made \$50,000 - \$99,999, and 12.2% made \$100,000 or more. Additionally, 43.6% of the respondents reported children under the age of 18 living in their homes. The average age of the respondents was 38.17 ($SD = 12.74$),

ranging from 18 to 64. According to the 2019 Oklahoma Census, 25.5% of the population over the age of 25 had earned a bachelor's degree or higher, and the median household income was approximately \$53,000 (U.S. Census Bureau, 2020). Differences between sample demographics and population demographics should be considered when interpreting the findings of this study.

Eight questions from the COVID-19 section of the survey were analyzed in this research. These questions were adapted from a previous study that explored the role of the RISP model and cultural cognition on consumers' risk perceptions related to water quality (Hmielowski et al., 2018). Additionally, cultural worldviews were measured through two separate variables: grid (i.e., egalitarian to hierarchy) and group (i.e., individualist to communitarian; Kahan, 2012).

A four-item, five-point Likert-type scale was used to measure grid (i.e., egalitarian to hierarchy). The scale was adapted from prior research (Hmielowski et al., 2018; Kahan, 2012); the items remained the same, but the scale was changed from a six-point to a five-point scale. The scale had the following labels: 1 = *strongly disagree*, 2 = *disagree*, 3 = *neither agree nor disagree*, 4 = *agree*, and 5 = *strongly agree*. Respondents reported their level of agreement with the following items: "We have gone too far in pushing equal rights in our country," "Our society would be better off if the distribution of wealth was more equal," "We need to dramatically reduce inequalities between the rich and the poor," and "Discrimination against minorities is still a very serious problem in our society." Items were coded so a lower score indicated egalitarian worldviews and higher scores indicated hierarchical worldviews. The scale was found to be reliable, with a Cronbach's alpha of .78 (Field, 2013). The four items were averaged to create the grid worldview construct.

A four-item, five-point Likert-type scale was used to measure the group worldview (i.e., individualist to communitarian). This scale was also adapted from Hmielowski et al. (2018) and Kahan's (2012) research. The same labels as the grid measurement were used, and the items remained the same. Respondents were asked to report how much they agreed or disagreed with the items on the scale, including "Government interferes too much in our everyday lives," "Sometimes government needs to make laws that keep people from hurting themselves," "Government should put limits on the choices individuals make so they don't get in the way of what's good for society," and "It's not the government's business to try to protect people from themselves." Items were coded so that lower scores indicated an individualist worldview while higher scores indicated a more communitarian worldview. Even though this scale has been published in prior research (Hmielowski et al., 2018), Cronbach's alpha was .53, which is below the threshold of .70 to consider a scale reliable (Field, 2013). Removing an item did not increase the reliability of this scale; however, Nunnally (1978) reported reliability above .50 can be acceptable in social science research or during early stages of scale development. The four items were averaged to create the group construct. Additional discussion for the reliability of this scale has been included in the recommendations section of this paper.

Perceived risk of food-purchasing behaviors during COVID-19 was measured through a five-item, five-point Likert-type scale with the following labels: 1 = *not at all concerned*, 2 = *slightly concerned*, 3 = *moderately concerned*, 4 = *very concerned*, and 5 = *extremely concerned*.

Respondents were asked how concerned they were to engage in the following activities over the past seven days: shopping in grocery stores, shopping at farmers markets, eating at restaurants, ordering takeout from restaurants, and purchasing food directly from farmers and ranchers.

These items were averaged to create the risk perception construct (Cronbach's $\alpha = .90$). Real limits were created to aid in the interpretation of the findings (Sheskin, 2004). The real limits for this scale were as follows: 1.00–1.49 = not concerned, 1.50–2.49 = slightly concerned, 2.50–3.49 = somewhat concerned, 3.50–4.49 = concerned, and 4.50–5.00 = extremely concerned.

Knowledge and knowledge insufficiency were measured on 10-point Likert-type scales with varying question stems. The question stems for the knowledge variable stated, "Please indicate how much knowledge you have about the following topics." The stem for knowledge insufficiency stated, "Please indicate how much knowledge you think you need on these topics in order to make judgments on these issues." Both scales were adapted from Hmielowski et al. (2018), which used a scale that ranged from 0 = *nothing at all* to 100 = *everything*. The scale was changed to 10 points to make it more user-friendly for mobile devices and laptops with the same anchoring labels at 0 and 10. Both indexes included the following five items: COVID-19 transmission, COVID-19's impact on the food supply, the risk of contracting COVID-19 inside, and the risk of contracting COVID-19 outside. Both the knowledge (Cronbach's $\alpha = .91$) and knowledge insufficiency (Cronbach's $\alpha = .96$) indexes were reliable, and the items in each scale were average. The real limits created for knowledge and knowledge insufficiency were 1.00–2.49 = limited knowledge, 2.50–4.49 = slight knowledge, 4.50–6.49 = moderate knowledge, 6.50–8.49 = moderately high knowledge, and 8.50–10.00 = high knowledge.

Heuristic processing and systematic processing were measured using two different four-item, five-point Likert-type scales adapted from Hmielowski et al. (2018). The scales used the same labels as the cultural cognition indexes. Both indexes asked respondents to indicate their level of agreement with the presented items. Items used to measure heuristic processing included, "When I see information about COVID-19, I rarely spend much time thinking about it," "There is far more information on COVID-19 than I personally need," "When I encounter information about COVID-19, I focus on only a few key points," and "If I need to make a decision impacted by COVID-19, the advice of one expert is enough for me." These items were averaged to create the heuristic processing index (Cronbach's $\alpha = .75$). The items measuring systematic processing included, "After I encounter information about COVID-19, I am likely to stop and think about it," "If I need to make a decision impacted by COVID-19, I want as many viewpoints as possible," "When I encounter information about COVID-19, I read or listen to most of it, even though I may not agree with the perspective," and "After taking the time to think about COVID-19, I have a broader understanding of the topic." These items were found to be reliable (Cronbach's $\alpha = .81$), and the systematic processing index was created by averaging the items.

The following real limits were created to interpret these scales: 1.00–1.49 = strongly disagree, 1.50–2.49 = disagree, 2.50–3.49 = neither agree nor disagree, 3.50–4.49 = agree, and 4.50–5.00 = strongly agree.

Information seeking was measured with a five-item, five-point Likert-type scale that asked respondents how much they agreed or disagreed with the associated statements. This scale was also adapted from Hmielowski et al. (2018) and used the same labels as the information processing scales. Items included, “When COVID-19 information comes up, I am likely to tune it out,” “When COVID-19 information comes up, I go out of my way to avoid learning more about it,” “Gathering a lot of information about COVID-19 is a waste of time,” “When the topic of COVID-19 comes up, I try to learn more about it,” and “When it comes to COVID-19, I am likely to go out of my way to get information.” Items were recoded so a higher score indicated increased levels of active information seeking and averaged to create the index (Cronbach’s $\alpha = .82$). The same real limits for the information processing scales were used to interpret information-seeking behaviors.

All data were imported and analyzed in Statistical Package for the Social Sciences (SPSS) version 25. Descriptive statistics were used to report objectives one through four. Objective one also includes a scatterplot to visualize the cultural cognition of the respondents. Hierarchical linear regression was used to fulfill objective five. Similar to past research (Cross et al., 2018; Lu et al., 2020; Rose et al., 2017), the risk information-seeking behavior index served as the dependent variable for this model. A hierarchical regression was used for this study to understand the unique amount of variance the cultural cognition and RISP variables could account for in predicting risk information-seeking behaviors, which reflected past RISP research approaches (Cross et al., 2018). The first model included demographic variables of age, income, education, gender, and if respondents were parents/guardians of children younger than 18. Gender and children in the house were nominal variables and dummy coded for analyses. The group with the largest number of cases was treated as the control and coded as “0” (gender = *female*, children = *none*). Cultural cognition variables, including group (i.e., individualist to communitarian) and grid (i.e., egalitarian to hierarchy), were added to the second model because political ideology has been linked to COVID-19 concerns (Pew Research Center, 2020a, 2020b) and therefore was assumed to be of importance (Field, 2013). The third and final model added the RISP variables, including risk perception, knowledge, knowledge insufficiency, heuristic processing, and systematic processing.

All assumptions were met for the hierarchical regression. The skewness and kurtosis for the independent and dependent variables were between ± 2 , so assumptions for normality were met. Additionally, the variance inflation factors (VIF) and tolerance were within acceptable ranges (i.e., less than 10 and greater than .20, respectively), which decreased the threat of multicollinearity (Bowerman & O’Connell, 1990; Field, 2013; Menard, 1995).

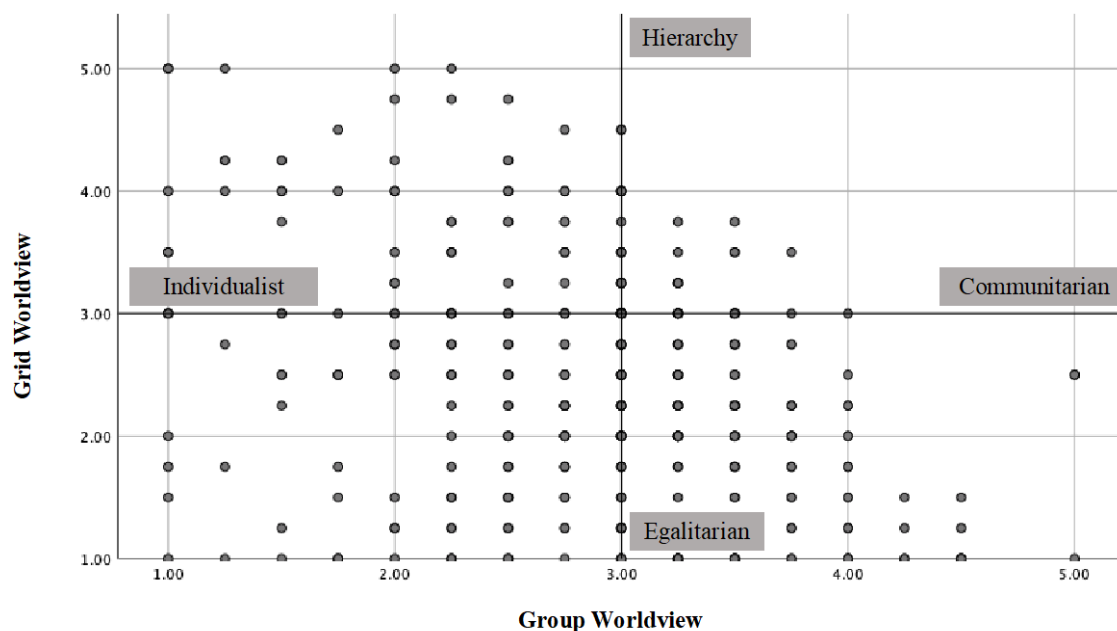
Cognitive interviews were conducted with two Oklahoma residents to help ensure face and content validity. After the cognitive interviews, items were adjusted for clarity and usability on different digital devices. The instrument was also reviewed by two individuals in Oklahoma with expertise in local food.

Results

Objective 1: Cultural Cognition

The group measurement (i.e., individualist to communitarian) had an average of 2.87 ($SD = 0.74$), while the grid measurement (i.e., egalitarian to hierarchical) had an average of 2.46 ($SD = 0.95$). A scatterplot of the group and grid variables has been presented in Figure 2 to visualize the distribution of cultural cognition within the sample. The respondents skewed toward individualist group views with both hierarchical individualist and egalitarian individualists.

Figure 2. Respondents' Cultural Worldviews



Objective 2: COVID-19 Risk Perception

Respondents' reported risk perception related to purchasing food during COVID-19 was 2.43 ($SD = 1.12$). This score indicated respondents were slightly concerned when engaging in food-purchasing behaviors.

Objective 3: Knowledge Insufficiency

Respondents' reported knowledge related to COVID-19 transmission was 6.63 ($SD = 2.01$), and their knowledge insufficiency related to COVID-19 transmission was 7.17 ($SD = 2.44$). Both of these scores indicated respondents believed they possessed moderately high knowledge and needed to have moderately high knowledge when it came to COVID-19.

Objective 4: Information Processing and Seeking Behaviors

Respondents neither agreed nor disagreed that they used heuristic processing ($M = 2.81$, $SD = 0.89$) when exposed to COVID-19 information. However, they did agree they used systematic information processing, with an average of 3.64 ($SD = 0.78$). Respondents' neither agreed nor disagreed that they engaged in active information-seeking behaviors related to COVID-19 ($M = 3.49$, $SD = 0.85$).

Objective 5: Predicting Information Seeking Behaviors

Hierarchical regression was used to fulfill objective five, and information-seeking behavior was treated as the dependent variable (Table 2). Model 1 included demographic information and could account for 2% of the variance in risk-seeking behaviors related to COVID-19 ($R^2 = .02$, $F(5, 404) = 3.17$, $p = .01$). Education was the only statistically significant predictor in the model ($b = 0.07$, $p = .03$). Cultural cognition variables were included in Model 2 and could uniquely account for 23% of the variance in the model ($\Delta R^2 = .23$, $F(2, 403) = 61.58$, $p < .01$). The second model remained statistically significant ($R^2 = .26$, $F(7, 402) = 20.54$, $p < .01$), and both the grid and group variables were predictors of information-seeking behaviors. Respondents with more hierarchical grid worldviews were less likely to actively seek COVID-19 information ($b = -0.34$, $p < .01$), and respondents with more communitarian group worldviews were more likely to actively seek information ($b = 0.23$, $p < .01$). Education was no longer a predictor of information seeking behaviors in the presence of cultural cognition variables ($b = 0.04$, $p = .10$).

The final model added RISP variables to account for knowledge insufficiency, risk perception, and information processing behaviors. This model could account for 59% of the total variance in predicting risk-seeking behaviors ($R^2 = .59$, $F(12, 397) = 46.79$, $p < .01$). The RISP variables could uniquely account for 32% of the total variance ($\Delta R^2 = .32$, $F(5, 397) = 61.80$, $p < .01$). In the presence of the RISP variables, the group worldview was no longer a predictor ($b = 0.06$, $p = .13$), but grid worldview remained a predictor ($b = -0.15$, $p < .01$). Heuristic processing was a predictor. The more respondents relied on heuristic processing, the less they actively sought risk information related to COVID-19 transmission ($b = -0.44$, $p < .01$). Conversely, the more respondents systematically considered COVID-19 information, the more they actively sought COVID-19 transmission information.

Table 2. Predicting Information Seeking Behaviors

	Model 1		Model 2		Model 3	
	<i>b</i>	<i>p</i>	<i>b</i>	<i>p</i>	<i>b</i>	<i>p</i>
Constant	3.14	.00**	3.11	.00**	3.16	.00**
Age	0.00	.06	0.01	.00**	0.01	.01*
Gender (Male)	-0.10	.24	-0.01	.87	0.02	.76
Children (Yes)	-0.15	.08	-0.09	.25	-0.10	.08
Education	0.07	.03*	0.04	.10	0.03	.10
Income	0.00	.96	0.00	.87	0.01	.82
Grid (egalitarian – hierarchical)			-0.34	.00**	-0.15	.00**
Group (individualist – communitarian)			0.23	.00**	0.06	.13
Knowledge					0.02	.16
Knowledge Insufficiency					0.01	.64
Risk Perception					0.04	.22
Heuristic Processing					-0.44	.00**
Systematic Processing					0.32	.00**
R ²	.04		.25		.59	.00**
F	3.17	.01*	20.54	.00**	46.79	.00**
Δ R ²			.23		.32	
Δ F			61.58	.00**	61.80	.00**

* $p < .05$, ** $p < .01$

Discussion

While COVID-19 may be one of the most pressing health crises in modern times, there is always a threat of future pandemics (National Academy of Sciences, 2016), and Extension educators and agricultural communicators need to be prepared to deliver effective risk information during these times of crises. However, consumers will also need to sift through communication to find trustworthy and reliable information to help them make judgments. Therefore, the purpose of this research was to explore the influences on consumers' risk information-seeking behaviors. This study was conducted prior to the COVID-19 vaccine and the widespread emergence of COVID-19 variants. However, this research still provides valuable context for how people might respond to risk information at the beginning of an outbreak. This research drew upon concepts related to cultural cognition theory (Kahan, 2012) and the RISP model (Griffin et al., 1999) to better understand what influences people to actively seek information related to COVID-19.

Respondents in the sample reported only a slight concern about engaging in food purchasing behaviors in the week prior to the study, despite rising levels of COVID-19 in Oklahoma and the governor testing positive for the virus (LaCroix, 2020; Wamsley, 2020). This lack of concern may stem from the respondents' group worldview, which is skewed toward individualistic.

Respondents may believe they are able to meet their own goals, like purchasing food and staying

safe, without the collective public health strategy of the community (Kahan, 2012), which would ease their concerns when it comes to purchasing food.

Respondents believed they possessed moderately high knowledge about COVID-19 transmission and needed moderately high knowledge about the topic to make judgments around the issue. While knowledge insufficiency was greater than knowledge, there were no practical differences between the scores due to the large standard deviations. According to the RISP model, respondents' slight concern related to COVID-19 would likely not spark a need for respondents to obtain more information than they already had to make proper judgments (Griffin et al., 1999), which would explain why these scores are so close. While perceived knowledge is important within the RISP model to understand one's desire to seek information, it should be noted this knowledge scale does not reflect actual knowledge related to COVID-19.

Respondents tended to agree they engaged in more systematic processing behaviors than heuristic processing behaviors, indicating they were more often thoughtfully considering COVID-19 information. However, they neither agreed nor disagreed that they were actively seeking information related to the pandemic. Because the data for this study were collected in the summer of 2020, respondents likely were concerned about the effects of COVID-19 but may have been fatigued from the amount of information they were exposed to related to the topic, which could explain high levels of systematic processing coupled with only moderate levels of active information seeking. The final regression model, which included demographics, cultural cognition, and RISP variables, could account for 59% of the variance in risk information-seeking behaviors. This large effect size (Cohen, 1988) demonstrates that the application of the RISP model and cultural cognition framework was appropriate for this research. The overall importance and familiarity of COVID-19 were likely driving factors for why this framework performed so well (Yang et al., 2013).

The cultural cognition variables could account for 23% of the unique variance in the dependent variable, which supported the importance of treating ideology as a complex set of views opposed to a unidimensional characteristic (Feldman & Johnston, 2014; Jost et al., 2009). The RISP variables could account for the greatest amount of unique variance in risk information-seeking behaviors at 32%. In the final model, the group variable was a statistically significant predictor of information-seeking behaviors, with more communitarian respondents being more likely to actively seek information related to COVID-19 compared to those with individualistic worldviews. This finding may be due to recommendations that citizens follow social distancing and mask-wearing guidelines to control the transmission of COVID-19 (CDC, 2020), which would align with a communitarian worldview (Kahan, 2012). However, this variable had a low reliability score despite being published in prior literature (Hmielowski et al., 2018). The question stem and items were not changed from the original article, so this issue of reliability may have reflected the volatile nature of public opinion during a year of a global pandemic, civil unrest, and an upcoming presidential election (Schmich, 2020).

Similar to the Hmielowski et al. (2018) research, increased levels of heuristic processing predicted decreased levels of risk-information-seeking behaviors, while increased levels of systematic processing predicted increased levels of risk-information-seeking behaviors. Contradictory to prior research (Lu et al., 2020; Rose et al., 2017), knowledge and knowledge insufficiency were not predictors in the model. This finding may be due to the similarity in the two variable scores, which would cause respondents to believe they did not need to seek additional information (Griffin et al., 1999). Additionally, regardless of the accuracy of the information, respondents would have been exposed to a barrage of media coverage related to COVID-19 (Joszt, 2020), which could have decreased their motivation to seek new information actively.

An interesting finding in this study was that risk perception related to purchasing food during COVID-19 was not a predictor in the model. Risk perceptions were measured within the context of food purchases, which may explain this lack of statistical significance. Extension educators should be aware that concerns related to food-purchasing decisions did not appear to influence risk information-seeking behaviors for COVID-19. Americans have vastly changed the way they shopped for food in 2020 and possibly for good, which may explain their low levels of concern now that the behaviors have become a habit (Severson, 2020).

Recommendations

While the research in this paper is not generalizable outside Oklahoma, it still provides critical insight for practitioners and researchers alike. When identifying audiences for education and communication campaigns, practitioners should consider using group and grid variables instead of political ideology to develop audience profiles. Targeting consumers with communitarian worldviews with messages that promote the success of the community would help to drive active, risk-information-seeking behaviors. Additionally, Extension programs should provide multiple sources of information and opportunities for two-way engagement with community stakeholders to encourage the systematic processing of risk information. Although concerns related to purchasing food during COVID-19 were limited, practitioners could focus communication on the risk of transmitting COVID-19 in different food-purchasing settings. While the goal of this communication would not be to induce panic, increasing the perceived risk of contracting COVID-19 while making food purchases would likely increase the need to obtain more knowledge, thus triggering active information-seeking behaviors (Griffin et al., 1999).

This study should be replicated in other states and countries to generalize these findings to populations outside of Oklahoma. COVID-19 has impacted the globe (WHO, 2020), and understanding how local culture and government influenced risk information-seeking behaviors would help improve risk communication in the future. If this research is to be replicated, the group variable would need to be edited to account for the low reliability in this study. Adding additional items to the scale and testing the variable across multiple populations would help to

strengthen this measurement for future studies. Although the group variable did not perform as expected, researchers should consider measuring ideology using cultural cognition theory as opposed to asking a unidimensional political affiliation question. Asking additional demographic questions related to household size or rural/urban residency could also provide valuable insight into risk information-seeking behaviors. It would also be helpful to understand how food access and food purchasing behaviors inform how people seek risk information related to COVID-19 and food purchases.

Future studies should utilize structural equation modeling (SEM) or path analysis to understand how the variables interact and influence one another within the context of COVID-19. Additional risk perception questions should be asked about COVID-19, in general, to help Extension educators and agricultural communicators better understand if concerns related to purchasing food differ from other activities that may expose consumers to COVID-19. Additionally, this research should be replicated to understand how current vaccine adoption rates and COVID-19 variants (like Omicron and Delta variants) would influence how consumers seek and process risk information related to COVID-19. Because this study only focused on parts of the RISP model, additional questions could be added in future studies. Asking about past hazard experiences (i.e., testing positive for COVID-19) and where consumers receive information about the pandemic would provide more robust recommendations for future risk communication and Extension programming.

References

- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179–211. [https://doi.org/10.1016/0749-5978\(91\)90020-t](https://doi.org/10.1016/0749-5978(91)90020-t)
- America's Health Rankings. (2022). *Explore food insecurity in Oklahoma| 2021 health of women and children report*. https://www.americashealthrankings.org/explore/health-of-women-and-children/measure/food_insecurity_household/state/OK
- Baker, R., Brick, J., Bates, N., Battaglia, M., Couper, M., Dever, J., Gile, K. J., & Tourangeau, R. (2013). Summary report of the AAPOR task force on non-probability sampling. *Journal of Survey Statistics and Methodology*, 1(2), 90–143. <https://doi.org/10.1093/jssam/smt008>
- Bowerman, B. L., & O'Connell, R. T. (1990). *Linear statistical models: An applied approach*. Duxbury Press.
- Centers for Disease Control and Prevention. (2020, July 15). *Coronavirus disease 2019 (COVID-19)*.
- Centers for Disease Control and Prevention. (2021a, May 7). *Scientific brief: SARS-CoV-2 transmission*. <https://www.cdc.gov/coronavirus/2019-ncov/science/science-briefs/sars-cov-2-transmission.html>
- Centers for Disease Control and Prevention. (2021b, August 1). *COVID-19 vaccinations in the United States*. <https://covid.cdc.gov/covid-data-tracker/#vaccinations>

- Centers for Disease Control and Prevention. (2021c, August 1). *United States COVID-19 cases, deaths, and laboratory testing (NAATs) by state, territory, and jurisdiction*.
- Chabon, G. M., Jones, C. W., Rand, R., Stern, M. L., & King, H. (2020, March 23). Shelter in place orders: Are you an “essential business”? *The National Law Review*.
<https://www.natlawreview.com/article/shelter-place-orders-are-you-essential-business>
- Cohen, J. (1988). *Statistical power analysis for behavioral sciences* (2nd ed.). Academic Press.
- Cross, M., Heeren, A., Cornicelli, L. J., & Fulton, D. C. (2018). Bovine tuberculosis management in northwest Minnesota and implications of the risk information seeking and processing (RISP) model for wildlife disease management. *Frontiers in Veterinary Science*, 5. <https://doi.org/10.3389/fvets.2018.00190>
- Dillman, D., Smyth, J., & Christian, L. (2014). *Turbulent times for survey methodology* (4th ed.). John Wiley & Sons, Inc.
- Douglas, M. (1970). *Natural symbols: Explorations in cosmology*. Pantheon Books.
- Douglas, M. (1982). *The active voice*. Routledge.
- Eagly, A. H., & Chaiken, S. (1993). *The psychology of attitudes*. Wadsworth Publishing Company.
- Elflein, J. (2022). *COVID-19 death rate in the United States as of January 31, 2022*. Statista.
- Feldman, S., & Johnston, C. (2013). Understanding the determinants of political ideology: Implications of structural complexity. *Political Psychology*, 35(3), 337–358.
<https://doi.org/10.1111/pops.12055>
- Field, A. (2013). *Discovering statistics using IBM SPSS statistics* (4th ed.). SAGE Publications.
- Griffin, R. J., Dunwoody, S., & Neuwirth, K. (1999). Proposed model of the relationship of risk information seeking and processing to the development of preventive behaviors. *Environmental Research*, 80(2), S230–S245. <https://doi.org/10.1006/enrs.1998.3940>
- Hmielowski, J. D., Wang, M. Y., & Donaway, R. R. (2018). Expanding the political philosophy dimension of the RISP model: Examining the conditional indirect effects of cultural cognition. *Risk Analysis*, 38(9), 1891–1903. <https://doi.org/10.1111/risa.12993>
- Holcomb, R. B., Ruler, K. V., Smith, C., & Graves, A. (2021, August 17). *US and Oklahoma COVID impacts on food shopper buying patterns* (FAPC-237). Oklahoma State University Extension. <https://extension.okstate.edu/fact-sheets/us-and-oklahoma-covid-impacts-on-food-shopper-buying-patterns.html>
- Jost, J. T., Federico, C. M., & Napier, J. L. (2009). Political ideology: Its structure, functions, and elective affinities. *Annual Review of Psychology*, 60(1), 307–337.
<https://doi.org/10.1146/annurev.psych.60.110707.163600>
- Joszt, L. (2020, September 25). *Combatting COVID-19 misinformation*. AJMC.
<https://www.ajmc.com/view/combating-covid-19-misinformation>
- Kahan, D. M. (2012). Cultural cognition as a conception of the cultural theory of risk. In S. Roeser, R. Hillerbrand, P. Sandlin, & M. Peterson (Eds.), *Handbook of risk theory: Epistemology, decision theory, ethics, and social implications of risk*. Springer.

- LaCroix, R. (2020, July 23). *Oklahoma's new COVID-19 cases in July total more than past four months combined*. KOSU. <https://www.kosu.org/post/oklahomas-new-covid-19-cases-july-total-more-past-four-months-combined>
- Leal, A., Rumble, J. N., Lamm, A. J., & Gay, K. D. (2020). Discussing Extension agents' role in moderating contentious issues conversations. *Journal of Human Sciences and Extension*, 8(2), 1–14. <https://doi.org/10.54718/NYSF5815>
- Lu, H., Winneg, K., Jamieson, K. H., & Albarracin, D. (2020). Intentions to seek information about the influenza vaccine: The role of informational subjective norms, anticipated and experienced affect, and information insufficiency among vaccinated and unvaccinated people. *Risk Analysis*, 40(10), 2040–2056. <https://doi.org/10.1111/risa.13459>
- Mandavilli, A. (2021). The delta variant is the symptom of a bigger threat: Vaccine refusal. *The New York Times*. <https://www.nytimes.com/2021/07/25/health/coronavirus-vaccine-refusal.html>
- Mayo Clinic. (2020). *Coronavirus disease 2019 (COVID-19)*. <https://www.mayoclinic.org/diseases-conditions/coronavirus/symptoms-causes/syc-20479963#:~:text=Although%20most%20people%20with%20COVID,seriously%20ill%20with%20COVID%2D19%20>
- Menard, S. W. (2002). *Applied logistic regression analysis*. SAGE Publications.
- Miller, H. (2020, April 30). *Reopening America: A state-by-state breakdown of the status of coronavirus restrictions*. CNBC. <https://www.cnbc.com/2020/04/30/coronavirus-states-lifting-stay-at-home-orders-reopening-businesses.html>
- National Academy of Sciences. (2016, January 13). *Future pandemics pose massive risks to human lives, global economic security: New report*. ScienceDaily. <https://www.sciencedaily.com/releases/2016/01/160113132805.htm>
- Nunnally, J. C. (1978). *Psychometric theory*. McGraw-Hill.
- Pew Research Center. (2020a, July 2). *Most Americans say federal government has primary responsibility for COVID-19 testing*. <https://www.pewresearch.org/politics/2020/05/12/most-americans-say-federal-government-has-primary-responsibility-for-covid-19-testing/>
- Pew Research Center. (2020b, July 8). *Republicans, Democrats move even further apart in coronavirus concerns*. <https://www.pewresearch.org/politics/2020/06/25/republicans-democrats-move-even-further-apart-in-coronavirus-concerns/>
- Rose, K. M., Toman, E., & Olsen, C. S. (2017). Public use of information about smoke emissions: Application of the risk information seeking and processing (RISP) model. *Canadian Journal of Forest Research*, 47(11), 1527–1537. <https://doi.org/10.1139/cjfr-2017-0099>
- Schmich, M. (2020, August 15). Is 2020 the worst year ever? *Chicago Tribune*. <https://www.chicagotribune.com/columns/mary-schmich/ct-met-schmich-2020-worst-year-ever-20200815-oini6cz7pjh2bnterpmttoyleam-story.html>

- See reopening plans and mask mandates for all 50 states. (2021, July 1). *The New York Times*. <https://www.nytimes.com/interactive/2020/us/states-reopen-map-coronavirus.html>
- Severson, K. (2020, September 8). 7 ways the pandemic has changed how we shop for food. *The New York Times*. <https://www.nytimes.com/2020/09/08/dining/grocery-shopping-coronavirus.html>
- Sheskin, D. J. (2004). *Handbook of parametric and nonparametric statistical procedures* (3rd ed.). CRC Press LLC.
- U.S. Census Bureau QuickFacts: Oklahoma. (2019). Census Bureau. <https://www.census.gov/quickfacts/OK>
- U.S. Census Bureau QuickFacts: Oklahoma. (2020). Census Bureau. <https://www.census.gov/quickfacts/OK>
- Wamsley, L. (2020, July 15). *Oklahoma governor tests positive for coronavirus*. NPR.org. <https://www.npr.org/sections/coronavirus-live-updates/2020/07/15/891432575/oklahoma-governor-tests-positive-for-covid-19>
- World Health Organization. (2020, September 8). *United States of America: WHO coronavirus disease (COVID-19) dashboard*. <https://covid19.who.int/region/amro/country/us>
- Yang, J. Z., Chu, H., & Kahlor, L. (2019). Fearful conservatives, angry liberals: Information processing related to the 2016 presidential election and climate change. *Journalism & Mass Communication Quarterly*, 96(3), 742–766. <https://doi.org/10.1177/1077699018811089>
- Yang, Z. J., Kahlor, L. A., & Griffin, D. J. (2013). I share, therefore I am: A U.S.–China comparison of college students' motivations to share information about climate change. *Human Communication Research*, 40(1), 112–135. <https://doi.org/10.1111/hcre.12018>
- Yang, Z. J., Rickard, L. N., Harrison, T. M., & Seo, M. (2014). Applying the risk information seeking and processing model to examine support for climate change mitigation policy. *Science Communication*, 36(3), 296–324. <https://doi.org/10.1177/1075547014525350>
- Yuen, K., Ye, Z., Fung, S., Chan, C., & Jin, D. (2020). SARS-Cov-2 and COVID-19: The most important research questions. *Cell & Bioscience*, 10(1). <https://doi.org/10.1186/s13578-020-00404-4>

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Acknowledgments

This work was supported by the USDA National Institute of Food and Agriculture, Hatch project OKL03072.

Building Buy-in: A Qualitative Study Seeking to Understand Stakeholder Perceptions of a University Extension System Through the Lens of External Branding

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A brand is an organization's link to its audiences. When the audience is asked to participate in building a brand culture, they are more likely to hold a favorable attitude toward the brand and be loyal to the brand long term. The purpose of this study was to understand the UF/IFAS Extension brand's image from the perspective of the brand's stakeholders, specifically focusing on brand awareness, audience groups, and potential future obstacles for the brand. A series of six online focus groups were conducted during the spring/summer of 2021 using Zoom. Major themes identified were a public knowledge gap related to Extension and agriculture, the focus of UF/IFAS Extension was (too) broad, agriculture was not valued in the state, and a disconnect existed between the public and Extension and agriculture. Results confirm the complexity of branding an organization when efforts need to highlight products, such as programming, and services, such as soil sampling, while also embodying unseen values and culture associated with the brand. Results from this study can be used to improve the UF/IFAS Extension brand through increased marketing, determining appropriate focus and communicating that focus, and continuing to engage stakeholders in the co-creation of branding.

Keywords: branding, Extension, agriculture, focus groups, stakeholder engagement

Introduction/Literature Review

At its simplest level, Kornberger (2010) describes a brand as an organization's link to external audiences. A brand can be complex due to its ability to showcase products, goods, or services while also embodying—sometimes unstated and unseen—the values and culture of the organization (Franzen & Moriarty, 2009). Additionally, brand communications often include traditional components of organizations, such as a specific color palette, logo, or slogan (Bresciani & Eppler, 2010). Increasing awareness of a brand among its external audiences is important because a brand can create a greater shared meaning when communicated to stakeholders (de Chernatony et al., 2013). When audiences engage in the co-creation of a brand, a favorable attitude toward the brand should form, which has been shown to be an indicator of

brand loyalty (Merrilees & Fry, 2002). This process, where a brand is conceptualized in the mind of a stakeholder through a social process, communicates the brand's promise (Burmann et al., 2009). The outcome of this process is a brand's image (Keller, 1993), which is recognized as an external audience member's individual perception of a brand (Burmann et al., 2009). Whether a brand fulfills its promise is dependent on the external stakeholder's satisfaction and experience with all brand touchpoints (de Chernatony & Harris, 2000).

The purpose of the current study was to gather insight into stakeholders' perceptions of the UF/IFAS Extension brand's image. Previous work recommends brand image be studied in terms of audience perceptions, thoughts and feelings, and associations (Hofstede et al., 2007). Since stakeholder perceptions of a brand's image can be multifaceted and require a recall of memories (Keller, 1993), a qualitative approach is appropriate for its ability to explore meanings and interpretations of a topic (Liamputtong, 2011). As shown by the abundant amount of literature related to branding, it is considered a strategic endeavor to benchmark different features of an organization's brand over time in hopes of moving the needle forward (de Chernatony et al., 2013; Libai et al., 2010; Merrilees & Fry, 2002; Romaniuk & Gaillard, 2007; Settle et al., 2019).

Branding is considered an important aspect of all organizations (Libai et al., 2010; Romaniuk & Gaillard, 2007) but should especially be focused on in Extension systems because Extension's viability can heavily rely on public support in the form of funding dollars (Campbell, 1999; Hoggett, 2006). Extension, similar to not-for-profit or community organizations, often operates in dynamic environments "where competition for resources, employees, and clients is prevalent" (Miller & Merrilees, 2013, p. 172). Although a fairly new area of research, several studies have shown that these organizations struggle with branding in terms of positioning and marketing (Grounds & Griffiths, 2005; Hankinson, 2000; Kennedy, 1998; Lindsay & Murphy, 1996; Miller & Merrilees, 2013; Mort et al., 2007). Two characteristics of community organizations are that they typically answer to multiple stakeholders causing conflicting needs, and they can encounter issues with staff morale or effectiveness due to a lack of low compensation. Both of these factors can negatively affect an individual's perception of a brand's image and sentiment toward the brand (Miller & Merrilees, 2013).

Support of Extension from stakeholders is not possible without a positive perception of the brand's image and a general awareness of the brand (Settle et al., 2019). Nationwide, Extension is considered a "collaboration of state, federal, and county governments that provide scientific knowledge to the general public through educational programs" (Barry et al., 2020, p. 1). Specifically in Florida, the land-grant institution began as Florida Agricultural College. In 1905 multiple colleges were combined to establish the University of the State of Florida, known today as the University of Florida. After the Smith-Lever Act was passed in 1914, the Cooperative Extension Service began as an arm of the university, helping to educate the public on scientific research. UF/IFAS Extension retains its presence throughout the state, with offices in every county and many research and education centers (Barry et al., 2020). It is important to assess

brand image factors related to UF/IFAS Extension because these can differ from state to state in Extension systems (Settle et al., 2019) and can even differ from community to community (Israel et al., 2011).

Purpose and Objectives

The purpose of this study was to explore the UF/IFAS Extension brand's image from stakeholder perspectives. This specific set of stakeholders included association leaders, producers from many aspects of Florida's agriculture and natural resources sectors, and community leaders. The purpose of the study was fulfilled through the following research questions:

RQ1: What are stakeholder perceptions of UF/IFAS Extension related to brand awareness?

RQ2: What audience groups do stakeholders feel UF/IFAS Extension should focus on?

RQ3: What obstacles do stakeholders see for UF/IFAS Extension in the future?

Methods

To explore and answer the research questions of this qualitative study, researchers conducted a series of six online focus groups with UF/IFAS stakeholders. Focus groups were held between April 20 and June 3, 2021, using the videoconferencing platform Zoom. Each focus group lasted an hour and a half. Online focus groups were selected as the research method due to their ability to gather quality insight from many different perspectives while remaining geographically distanced (Oringderff, 2004), which was necessary due to the COVID-19 pandemic.

Sampling and Procedure

Purposive sampling was used to recruit participants to take part in the online focus groups. This sampling technique was selected because participants needed to have a comprehension of the organization in question to understand the research questions (Creswell, 2007). An email was sent to 130 potential participants through an email listserv. These recipients were considered UF/IFAS stakeholders and were identified by UF/IFAS administration. Potential participants ranged from association leaders to producers who represented many aspects of Florida's agriculture and natural resource sectors to community leaders. Focus groups were heterogeneous, as participants could select which day/time best fit their schedule. There were 57 responses to participate in the focus groups, and 45 of those respondents participated. Each focus group included between five and nine participants.

Prior to beginning this study or recruiting participants, approval was received from the UF/IFAS Institutional Review Board (#IRB202100410). Each focus group session began with an introduction to the study and information related to the consent form, which was shared with participants in the Zoom chat box at the start of the focus group session. Participants were

informed that remaining in the Zoom room was considered their consent to participate. In addition to participants, each focus group included a moderator, assistant moderator, and note-taker. Members of the research team who participated in these roles were trained prior to the sessions beginning. During the discussion, the moderator read instrument questions directly from the guide for consistency between focus groups, remained neutral to participant dialogue, and probed discussion when necessary. Probing occurred if participants provided vague or unclear answers to the posed question. The assistant moderator served as a backup to the lead moderator in case of technical issues. Notes provided by the note-taker were cross-referenced with transcriptions and audio recordings to ensure accuracy, dependability, and internal validity of the data (Flick, 2009). At the end of each focus group, the research team debriefed participants with a summary of the discussion, requested any additional comments or clarifications, and asked participants to confirm if this summary was an accurate reflection of the group discussion, which served as a member check (Creswell, 2007). Focus groups were recorded using the built-in recorder on the Zoom platform. These recordings were then transcribed using a paid transcription service.

Procedure

To ensure that discussion and data focused on the brand of this specific Extension system, researchers used empirical resources, such as language from previous communications materials and organizational mission and priorities, to formulate questions. Each focus group began with icebreaker questions for participants to share their names, general location in Florida, career, and any experience they have had with UF/IFAS Extension. Next, participants discussed how UF/IFAS Extension utilizes teaching, research, and Extension. Then participants were asked if UF/IFAS Extension was fulfilling its brand promise in terms of meeting stakeholder needs and if there were any programming gaps. Following this, the moderator led a discussion related to balancing UF/IFAS Extension's different audiences (i.e., providing communities with long-term support, helping the agriculture and natural resource sectors within the state, etc.). After that, the discussion shifted to whom the efforts of UF/IFAS Extension have been most beneficial. Finally, participants were asked if and how they felt connected to UF/IFAS Extension brand with specific consideration to methods of communication and content information. Many of these questions and topic areas were asked in varying ways, so they related to each local community, within the state, and specific industries. The discussion concluded with participants' thoughts on where UF/IFAS Extension should be in the next 10 years in relation to local, statewide, nationwide, international, and industry needs. These discussion points align with previous work that recommends studying brand image in terms of audience perceptions, thoughts and feelings, and associations (Hofstede et al., 2007). Furthermore, this instrument was reviewed by a panel of experts that specialize in Extension communications and qualitative research.

Data Analysis

Data analysis began by confirming transcripts matched audio recordings from the focus groups. Glaser's (1965) constant comparative method was used to analyze the data, which were managed using NVivo 12. Participant responses were coded by an independent coder who constantly compared the code at hand to previously established codes. Together, the research team triangulated the coded data into themes, which served as confirmability (Creswell, 2007). The audit trail of audio recordings and researcher notes lend dependability and validity to this study (Flick, 2009).

Researcher Subjectivity Statements

In qualitative research, it is important for members of the research team to disclose past experiences related to the research topic, which can taint or bias research perspectives when conducting and analyzing data. Research subjectivity statements serve as an important element to help the reader to determine the credibility and quality of the study (Preissle, 2008). The researcher who led the data analysis was a research assistant with a background in research work in Extension communications and is currently employed by the UF/IFAS. This research was funded by the UF/IFAS Extension, and the entire research team was employed by the UF/IFAS. Researchers acknowledged these biases and made an effort to consider alternative viewpoints that may not have been in support of the UF/IFAS Extension system.

Limitations

The main limitations of this study are those directly associated with qualitative research. Limitations included are that the results from this study are not generalizable but could provide guidance in other similar Extension structures. Another limiting factor to this study is that qualitative research is based on participants' ability to recall and relay information. Lastly, using online focus groups as a research method could potentially lead to more participant distractions and limit participant interaction through body language and facial expressions.

Results

To fulfill the purpose of this study, participants discussed the UF/IFAS Extension's brand image, specifically noting perceptions of brand awareness, audience focus, and future obstacles. As noted in the literature review, these are important components of an organization's brand. In summary, participants saw a knowledge gap of UF/IFAS Extension among the public, felt the current audience of UF/IFAS Extension was too broad, and felt the agricultural industry was becoming undesirable to the state; participants also perceived citizens as being disconnected from the industry.

RQ1: Stakeholder Perceptions Of UF/IFAS Extension Related to Brand Awareness

Public Knowledge Gap of UF/IFAS Extension

Participants felt a knowledge gap of UF/IFAS Extension exists, in both the general population and some segments of agricultural producers, meaning people are not informed about the state Extension service. This theme appeared in all six focus groups and was identified 41 times throughout all focus groups. Participants felt “UF/IFAS Extension has something to offer to everyone in the public and the agricultural and natural resources sector.” Additionally, many participants were aware of funding sources for Extension systems. They mentioned that “all people should be using UF/IFAS Extension more because the public’s tax dollars are helping fund UF/IFAS Extension.” One participant mentioned,

If you’re trying to set a goal for UF/IFAS Extension, I think that every refrigerator in the state of Florida needs to have UF/IFAS Extension [magnet] with a phone number to the county agent or the website and it becomes a household name. It needs to be the absolute number one resource for every citizen of the state of Florida, whether you are involved in production agriculture or 4-H or a consumer of any kind. UF/IFAS Extension touches everybody, and UF/IFAS Extension has to be seen as the resource for everybody. When we can get to that point, our lobbyist will not have such a battle trying to get money.

Some participants felt that because UF/IFAS Extension was related to agriculture, it gave people outside of the agricultural industry the perception that “UF/IFAS Extension was not useful to them.” Stemming from this discussion, participants noted issues regarding confusing acronyms and the misunderstanding of consumers’ role in the consumption and use of agricultural products. A participant stated, “They see agricultural, or they hear it, and they’re like, ‘Oh, that doesn’t apply to me ‘cause I’m not a farmer, rancher, whatever.’ In all reality, it does because they are a consumer of all things agriculture.”

Furthermore, participants noted that with many new people moving to Florida, UF/IFAS Extension should market itself better by “getting word out about what UF/IFAS Extension is, what UF/IFAS Extension does, and what UF/IFAS Extension resources are available.” Participants mentioned “getting the word out” about UF/IFAS Extension and “in front of the right eyeballs,” highlighting the issue of a knowledge gap among some populations. Also, on this topic, one participant said,

With so many new people moving to the state, the role of UF/IFAS Extension is more critical to each of us than it ever has been before. It’s about information, and as I said before, unbiased information. I think that UF/IFAS Extension, maybe this isn’t the right term to use, but almost needs to market itself a little bit better. Who are they? What can they do to help everyone? What resources are available? I think Extension, despite how wonderful it is, is probably a closely guarded secret.

RQ2: Audience Groups UF/IFAS Extension Should Focus On

UF/IFAS Extension's Broad Audience

When discussing which audiences UF/IFAS Extension should focus on, participants said UF/IFAS Extension was currently trying to reach a large target audience with broad interests. This theme was found in all six focus groups and was identified 14 times throughout all focus groups. Some felt it “impossible for UF/IFAS Extension to be everything to everyone.” One participant noted,

The slogan for UF/IFAS Extension a few years ago was “Solutions for Your Life.” I think that’s too broad. We can’t be everything to everybody. I think it’s important that we focus on things that we can do with excellence, and everything we do has to be done with excellence. In addition to just getting the name out there, I think it’s important to focus on the things that UF/IFAS Extension does with great excellence. It can’t just be a chicken in every pot and all things for all people. It has to be beyond that.

Moreover, a subset of participants thought it was important to reach “hard-to-reach,” non-traditional audiences moving forward into the future. This was mentioned in two focus groups identified 12 times in the analysis. Participants emphasized the fact that UF/IFAS Extension should “focus on those that are not exposed, that do not sit on those boards, and the other producers that maybe are not as connected and connecting with those [audiences].” These conversations entailed thoughts about how reaching non-traditional stakeholders of UF/IFAS Extension was important, as everyone can have a voice in public policy matters during voting periods. Related to this, one participant said, “As we look legislatively going forth, a lot of times it’s going to be those non-traditional stakeholders that have the ears of policy makers, and if they’re supportive of UF/IFAS Extension, that’ll go a long way.”

Within this theme, the topic of marketing and communication was also mentioned frequently because participants considered it difficult to reach “every person in the manner they want to be reached.” Many participants noted UF/IFAS Extension had broad audiences with broad interests that added to the difficulty of communicating and marketing about programs. Several felt it seemed impossible to continue down the path of reaching all audiences and thought UF/IFAS Extension should reflect on the purpose and mission of UF/IFAS Extension and land-grant institutions. A participant said,

It’s hard to see where UF/IFAS Extension needs to be. I think what I have heard is UF/IFAS Extension needs to be communicating in all of the possible ways, to reach all of the possible people, and delivering all of the possible programming to all of the possible clients and customers that may be in different counties. I don’t know how UF/IFAS Extension can do it all without waving some sort of magic wand, but I guess that’s where it boils down to the mission that it is research, education, and Extension.

RQ3: Obstacles For UF/IFAS Extension in The Future

In exploring obstacles that stakeholders saw for UF/IFAS Extension in the future, two main themes presented themselves: (1) agriculture perceived as becoming undesirable in Florida and (2) disconnect with agriculture. In the minds of the researchers, these themes were tangentially related to each other. Both themes were present in the majority of focus groups, and each theme was identified more than 20 times.

Agriculture Perceived as Becoming Undesirable in Florida

The first theme relating to obstacles was a perception that agriculture was becoming undesirable in Florida. Participants felt that Florida was shifting from a state that valued and wanted agricultural operations and rural areas to an urbanized state, where agriculture was considered undesirable by the state and consumers. This theme was identified 28 times throughout all focus groups. Some participant comments were related to the balance of “rural versus urban” within UF/IFAS Extension and within the state. One participant mentioned, “For the past two or three years, kind of in the background, I hear a little noise from rural Floridians about UF/IFAS Extension maybe changing its focus and not paying attention.” Another participant later echoed this feeling saying, “They may forget their roots sometimes ... I’ve heard that as well [out in the rural sector].” Participants felt UF/IFAS Extension may be shifting its focus away from traditional production agriculture and related stakeholders. Some felt this feeling specifically in relation to agricultural policy and the state industries. However, one participant, who works closely with UF/IFAS Extension, voiced dissent, saying UF/IFAS Extension continues to advocate for production agriculture, but stakeholders must see that as populations and counties shift and adapt, so must UF/IFAS Extension. Another participant commented on this transformation, saying, “When we go forth in Florida, which is very quickly becoming more urban than rural, how do we mesh all these industries to ensure the success of our agriculture, which keeps our waters clean, and our pastures green?”

Disconnect with Agriculture

The next theme identified within this research question was a disconnect from agriculture. Participants felt there was a disconnect from the industry in both the general public and government officials. This theme appeared in five out of six focus groups and was identified 22 times throughout all focus groups. In general, participants felt the public and government officials lacked an understanding of agricultural practices and their impacts. Some participants felt there needed to be a consumer education facet of UF/IFAS Extension. Specifically, one participant thought it would be important to spread educational messages to consumers about agriculture and related health and nutrition. “I think it’s important to spread the message, ‘Hey conventional ag isn’t bad. Animal protein isn’t bad.’ At least make sure they’re not just feeding off of the marketing they’re seeing on commercials.”

Moreover, participants felt general consumers thought UF/IFAS Extension was not for them because they do not understand their role in agriculture. This topic was brought up in five focus groups and identified 22 times. On this topic, a participant mentioned,

I don't usually like to speak up and give a complaint if I don't have a suggestion to go with it, but I don't have a suggestion at this point, and this is not just an UF/IFAS Extension problem. It's an agriculture, as a whole, problem that we are good about talking to people in agriculture and in our industry, but not so great at getting outside that, so if we can find a better way to reach outside. ... We're just talking ourselves, we're all nodding our heads, but we're not doing any good if we're not reaching the people that don't know.

Some participants also noted that agriculture is seemingly less represented through elected officials because people are further removed from agriculture. A suggestion on how to combat this came up during the discussion and was related to hosting tours that have producers share their stories and the challenges they face. As a result, consumers that attended would have a better understanding of agriculture. A quote from one participant related to this idea said,

A person who would attend that tour could be likely to strike up a conversation around their dinner table or next time they go out to eat with friends on what they learned, and that is such a critical part in today's world no matter what you do or what industry you are in.

Conclusions, Discussion, & Recommendations

Results from this study shed new light on a need for continued and revamped branding within UF/IFAS Extension. Stakeholders expressed concern that the core mission of UF/IFAS Extension was no longer clear to its traditional stakeholders, which is why branding cannot be a one-time event. As a brand changes and evolves, that brand connection with stakeholders must also grow and evolve to continue the organization's connection to its stakeholders (Kornberger, 2010). Additionally, stakeholders in this study indicated a need for stronger brand awareness of Extension and agriculture within the state by members of the general public and policymakers. This need directly aligns with branding literature in that increasing brand awareness is essential to create a greater shared meaning to communicate with stakeholders (de Chernatony et al., 2013). Moreover, stakeholders in this study had concerns that the focus of UF/IFAS Extension was too broad to allow for a deeper understanding of the brand to the public. This disconnect is concerning for the brand image of UF/IFAS Extension because support for Extension from stakeholders is not possible without a positive perception of the brand's image (Settle et al., 2019). The present study confirms the complexity of branding an organization when efforts need to highlight products, like programming, and services, like soil sampling and pest identification, while also embodying the unseen values and culture of a brand (Franzen & Moriarty, 2009). Additionally, results from this study confirm stakeholders see challenges in gaining public

backing for funding to support the work of agriculture and UF/IFAS Extension (Hoggett, 2006; Campbell, 1999).

The results from this study can be used to improve the brand image of UF/IFAS Extension. It is recommended that UF/IFAS Extension reflect on the focus of UF/IFAS Extension and what stakeholders feel may be too broad. If UF/IFAS Extension decides the mission should continue to be broad, the organization must communicate with stakeholders the need for this broad focus. By inviting stakeholders to engage in the process of planning for the future of UF/IFAS Extension, they are co-creators of the brand and will hold a more favorable attitude toward the brand and be loyal to the brand (Merrilees & Fry, 2002) if they believe their voices were heard in this process. It is recommended that the results of this study, and the brand development work after these results, be shared with stakeholders and communicated as a shared effort through all touchpoints in building a stronger UF/IFAS Extension brand image.

More broadly, it is recommended that Extension communicators and communication units understand the perspectives of UF/IFAS Extension stakeholders. Communicators should seek to develop marketing campaigns and strategies to communicate the value of agriculture to non-traditional audiences. Stakeholders in this study would feel seen and heard through this type of marketing campaign and would prove to be loyal to the brand in a new way (Merrilees & Fry, 2002). Large-scale efforts to market agriculture and, by extension, UF/IFAS Extension may have long-term benefits for legislative initiatives and increased funding for the UF/IFAS Extension organization (Campbell, 1999; Hoggett, 2006).

Implications from this work for other Extension systems and Extension communication, in general, are the need to prioritize marketing and branding for Extension and agriculture on a unified and national level. Seeking to help members of the public, legislators, and future stakeholders understand the value of agriculture and Extension is a large and extremely complex task. Budgets dedicated to marketing are typically low, and a unified effort would help share resources and provide better results.

For those teaching agricultural communications, it is important to teach branding strategies and continued measurement of branding efforts. Students need to understand the value of co-creating brands with stakeholders (Merrilees & Fry, 2002), communicating the values and culture of the organization (Franzen & Moriarty, 2009), and creating positive perceptions and general awareness of a brand (Settle et al., 2019). Instructors should use Extension systems as an example of how brands may have more than one product, service, or location to help students understand the complexity involved in branding a large-scale organization with stakeholders of diverse backgrounds and experiences.

Future research should investigate non-users of Extension and those from diverse audiences and backgrounds to determine the value of Extension beyond traditional stakeholders. Moreover, future work should use different methods of research to make sure all audience segments are

reached in a way that is most convenient to them. Additionally, in a post-pandemic time, research should be conducted in person with audiences, particularly those who may be technologically challenged.

References

- Barry, D., Diaz, J., Shepherd, A., & Gran, S. (2020). *Understanding Extension for school-based agricultural education #1: Extension 101* (WC372/AEC709). University of Florida Cooperative Extension Service. <https://edis.ifas.ufl.edu/publication/WC372>
- Bresciani, S., & Eppler, M. J. (2010). Brand new ventures? Insights on start-ups' branding practices. *Journal of Product & Brand Management*, 19(5), 356–366. <https://doi.org/10.1108/10610421011068595>
- Burmam, C., Hegner, S., & Riley, N. (2009). Towards an identity-based branding. *Marketing Theory*, 9(1), 113–118. <https://doi.org/10.1177/1470593108100065>
- Campbell, D. A. C. (1999). Managing public sector Extension: Some critical issues. *Proceedings of the Annual Conference of the Association for International Agricultural and Extension Education*, 152–157. <https://files.eric.ed.gov/fulltext/ED431614.pdf>
- Creswell, J. W. (2007). *Qualitative inquiry & research design* (2nd ed.). SAGE Publications.
- de Chernatony, L., & Harris, F. (2000). Developing corporate brands through considering internal and external stakeholders. *Corporate Reputation Review*, 3(3), 268–274. <https://doi.org/10.1057/palgrave.crr.1540119>
- de Chernatony, L., McDonald, M., & Wallace, E. (2013). *Creating powerful brands* (4th ed.). Routledge.
- Flick, U. (2009). *An introduction to qualitative research*. SAGE Publications.
- Franzen, G., & Moriarty, S. (2009). *The science and art of branding*. M.E. Sharpe.
- Glaser, B. G. (1965). The constant comparative method of qualitative analysis. *Social Problems*, 12(4), 436–445. <https://www.doi.org/10.2307/798843>
- Grounds, J., & Griffiths, J. (2005). NSPCC case study: Brand-building FULL STOP. *International Journal of Nonprofit Voluntary Sector Marketing*, 10(May), 69–77. <https://www.doi.org/10.1002/nvsm.13>
- Hankinson, P. (2006). Brand orientation in charity organizations: Qualitative research into key charity sectors. *Journal of Philanthropy and Marketing*, 5(3), 207–219. <https://doi.org/10.1002/nvsm.114>
- Hofstede, A., van Hoof, J., Walenberg, N., & de Jong, M. (2007). Project techniques for brand image research: Two personification-based methods explored. *Qualitative Market Research*, 10(3), 300–309. <https://doi.org/10.1108/13522750710754326>
- Hoggett, P. (2006). Conflict, ambivalence, and the contested purpose of public organizations. *Human Relations*, 59(2), 175–194. <https://doi.org/10.1177/0018726706062731>
- Israel, G. D., Harder, A., & Brodeur, C. W. (2011). *What is an Extension program?* (WC108). University of Florida Cooperative Extension Service. <https://edis.ifas.ufl.edu/wc108>

- Keller, K. L. (1993). Conceptualizing, measuring, and managing customer-based brand equity. *Journal of Marketing*, 57(1), 1–22. <https://doi.org/10.1177/002224299305700101>
- Kennedy, S. (2011). The power of positioning: A case history from the children's society. *Journal of Philanthropy and Marketing*, 3(3), 224–230. <https://doi.org/10.1002/nvsm.6090030306>
- Kornberger, M. (2010). *Brand society: How brands transform management and lifestyle*. Cambridge University Press.
- Liamputtong, P. (2011). *Focus group methodology: Principles and practice*. SAGE Publications.
- Libai, B., Bolton, R., Bugel, M., de Ruyter, K., Gotz, O., Risselada, H., & Stephen, A. (2010). Customer to customer interactions: Broadening the scope of word of mouth research. *Journal of Service Research*, 13(3), 267–282. <https://doi.org/10.1177/1094670510375600>
- Lindsay, G., & Murphy, A. (2010). NSPCC: Marketing the “solution” not the “problem.” *Journal of Marketing Management*, 12(8), 707–718. <https://doi.org/10.1080/0267257X.1996.9964448>
- Merrilees, B., & Fry, M. L. (2002). Corporate branding: A framework for e-retailers. *Corporate Reputation Review*, 5, 212–255. <https://doi.org/10.1057/palgrave.crr.1540175>
- Miller, D., & Merrilees, B. (2013). Rebuilding community corporate brands: A total stakeholder involvement approach. *Journal of Business Research*, 66(2), 172–179. <https://doi.org/10.1016/j.jbusres.2012.07.010>
- Mort, G. S., Weerawardena, J., & Williamson, B. (2007). Branding in the non-profit context: The case of surf life saving Australia. *Australasian Marketing Journal*, 15(2), 108–119. [https://doi.org/10.1016/S1441-3582\(07\)70047-2](https://doi.org/10.1016/S1441-3582(07)70047-2)
- Oringderff, J. (2004). “My way”: Piloting an online focus group. *International Journal of Qualitative Methods*, 3(3), 69–75. <https://doi.org/10.1177/160940690400300305>
- Petticrew, M., Egan, M., Thomson, H., Hamilton, V., Kunkler, R., & Roberts, H. (2008). Publication bias in qualitative research: What becomes of qualitative research presented at conferences? *Journal of Epidemiology and Community Health*, 62(6), 552–554. doi: <https://doi.org/10.1136/jech.2006.059394>
- Preissle, J. (2008). How to be an inspired qualitative methodologist: Learning from Egon Guba and his work. *International Journal of Qualitative Studies in Education*, 21(6), 551–553. <https://doi.org/10.1080/09518390802489014>
- Romaniuk, J., & Gaillard, E. (2007). The relationship between unique brand associations, brand usage and brand performance: Analysis across eight categories, *Journal of Marketing Management*, 23(3-4), 267–284. <https://www.doi.org/10.1362/026725707X196378>
- Settle, Q., Brubaker, M., Hardman, A., & Downey, L. (2019). Mississippi residents' perceptions of Extension. *Journal of Extension*, 57(5), Article 14. <https://tigerprints.clemson.edu/joe/vol57/iss5/14>

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Acknowledgments

This research was supported through funding from UF/IFAS Extension and the UF/IFAS Office of the Senior Vice President.

Community Science Online: Building Capacity for Native Bee Monitoring

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Native bees are crucial for sustainable productivity in natural, agricultural, and urban ecosystems, but they are losing natural habitat spaces. Extension can facilitate community science programs to collect ecological data on native bee populations and support pollinator conservation. Native Bee Watch, an in-person community science program, transitioned to a hybrid format where volunteers received online training and support for conducting field-based data collection. This article presents the volunteers' perceptions of the program training, support, and bee monitoring based on surveys and data analytics collected from technology tools. Study results indicate redesign successes and challenges and provide insight on how to improve the experience for volunteers participating in community science programs, with implications for Extension education.

Keywords: community science, citizen science, pollinators, online education, native bees, adult education, conservation education, volunteer engagement

Native bees and honey bees are crucial for sustainable productivity in natural, agricultural, and urban ecosystems (Gallai et al., 2009). Yet, Colorado is the seventh fastest-growing state by percentage population growth (U.S. Census Bureau, 2021), and rapid urbanization reduces natural habitats with valuable forage and nesting resources for bees (Goulson et al., 2015). Given the dire situation for bees worldwide, more effort is needed to increase public awareness and generate engagement in constructive ways (National Research Council, 2007). Efforts are underway to develop a national monitoring framework to establish comprehensive and consistent data collection on bee populations (Woodard et al., 2020), and engaging community scientists to collect data can build capacity to address pollinator conservation challenges (Birkin & Goulson et al., 2015; Woodard et al., 2020). Given its history of meeting community needs, managing volunteers, and translating science-based information, Extension is a natural fit for engaging

Colorado residents in bee population monitoring and informal STEM education through community science projects, also known as citizen science (Carr, 2004; Clyde et al., 2018).

Native Bee Watch (NBW), a community science program offered through Colorado State University Extension, enables volunteer community scientists to identify and monitor bees. NBW originated as an in-person program where volunteers collected data in public gardens. When the COVID-19 pandemic hit the United States in 2020, NBW was redesigned as a hybrid program with online training and field data collected at volunteers' residences. The purpose of this paper is to explore volunteers' perception of the online training, bee monitoring experience, and supports in the pandemic-adapted hybrid format. The hybrid format has the potential to increase opportunity and access for volunteers. Our successes and challenges provide a deeper understanding of how volunteers engage with learning resources in this technology-mediated design. Such understanding can benefit community science coordinators and Extension agents and inform the intentional integration of online training and resources with field-based data collection in ways that support volunteers' learning, engagement, retention, and program sustainability.

Literature Review

Community science, also known as citizen science, broadly describes projects in which “the public participates voluntarily in the scientific process, addressing real-world problems in ways that may include formulating research questions, conducting scientific experiments, collecting and analyzing data, interpreting results, making new discoveries, developing technologies and applications, and solving complex problems” (U.S. General Services Administration, 2020, para. 3). Community science comes in many forms, ranging from large scale, international biodiversity monitoring projects (e.g., Chandler et al., 2017) to localized co-created programs aimed at informing collaborative management decisions among government agencies, individuals, and community groups (e.g., Danielsen et al., 2005; Reid et al., 2016).

Modality varies widely across programs. Some projects operate fully online, such as Galaxy Zoo, where volunteers classify photos of galaxies through a virtual platform (Clery, 2011). Field-based community science is often designed such that all volunteer-involved activities are completed physically in person, including training, data collection, and data submission (e.g., through paper forms; National Academies of Sciences, Engineering, and Medicine [NASEM], 2018). Hybrid programs mix elements of online and in-person formats, meaning online training is provided, but data are collected in the physical world, or conversely, training and data collection are conducted in person, and volunteers submit their data to an online platform. Submitting field-collected data to an online database, such as iNaturalist or a project-specific platform, is becoming more common as it streamlines data processing for analysis.

The extent and nature of how volunteers participate in community science vary depending on each project's design and goals. Common types of participation can be categorized as

contributory, collaborative, and co-created (Shirk et al., 2012). Contributory projects include volunteers in data collection activities but do not involve them in other project phases, such as data analysis or defining project goals. Contributory projects often require volunteers to develop specific content knowledge and data collection skills (e.g., insect morphology, data protocols), but some projects ask volunteers to complete relatively simple tasks that require no special training (e.g., photo submission), such as in short-term mass participation projects or BioBlitzes (Pocock et al., 2017). Collaborative projects go beyond solely utilizing volunteers for data collection by offering opportunities to analyze and interpret data and identify potential impacts of the research. Co-created projects invite volunteers to participate in all aspects of the research process, from developing the study's purpose and research questions to generating recommendations based on results (Shirk et al., 2012). Each design has affordances and constraints in terms of purpose, volunteer opportunities, training, and engagement strategies.

While community science has made significant contributions to research activities (e.g., Chandler et al., 2017), the extent to which projects are designed to support participants' learning and engagement varies considerably and is largely unexplored (Bonney et al., 2016; Peter et al., 2021). This deficit is surprising, considering these elements enable volunteers to participate and persist in project activities and support data quality needed for achieving the project's scientific goals (Aristeidou et al., 2021). The historical lack of focus on volunteers' learning and engagement may be attributed to the origins of community science as a method for increasing the capacity of scientific research, resulting in project leaders' low attention to program designs that leverage the learning sciences (Bonney et al., 2016) and consideration of how volunteer characteristics such as project roles, motivation, and prior knowledge impact learning and engagement (Phillips et al., 2019). However, research aimed at understanding the relationship among training, engagement, motivation, retention, and learning outcomes is growing (Follett & Strezov, 2015) as community science is increasingly seen as a way to democratize science (Ottinger, 2010) and foster the general public's understanding of science (Bonney et al., 2016).

Volunteer Engagement

Engagement is conceptualized differently across disciplines and learning contexts (Lewenstien, 2015). In informal science education, engagement is often described as an interest in science or exhibiting interest-oriented behaviors (Friedman, 2008; McCallie et al., 2009). Community science is one venue for informal science learning, and there is a recognized need to describe the nature of volunteer engagement, particularly in field-based projects (Phillips et al., 2019). Yet, current definitions of engagement primarily rely on measures such as the number of volunteers, retention rates, the quantity of data collected, or how frequently a project website is accessed (Phillips et al., 2012). Describing engagement solely with output measures limits our understanding of the more nuanced ways volunteers experience engagement within community science, including acquiring knowledge and skills, community involvement, use of social media,

and communicating with fellow volunteers, program coordinators, and scientists (Phillips et al., 2019).

Based on an empirical investigation of how 72 volunteers described their engagement across a variety of field-based environmental monitoring projects (contributory, collaborative, co-created), Phillips et al. (2019) propose a definition of engagement in community science as the “emotional, behavioral, cognitive, and social experiences that initiate and sustain lifelong learning and that are largely influenced by motivational factors” (p. 684). A majority of volunteers reported multiple motivations, the most common being an environmental concern or issue of personal importance, wanting to contribute (e.g., to science, environment, community), interest in the project topic, and issues impacting their community. Other motivations included connection to a specific place, personal enjoyment, learning, social connections, scientific credibility, and being outdoors. Specific to pollinator community science programs, Domroese and Johnson (2017) and Bloom and Crowder (2020) found volunteers were primarily motivated by personal learning interests, such as wanting to learn more about bees, followed by a desire to contribute to scientific research. Furthermore, Domroese and Johnson (2017) found long-term volunteers more frequently reported motivations related to their scientific contributions, suggesting motivations may shift as volunteers participate across multiple years and transition from novice to experienced project members. Understanding shifts in motivation may assist project coordinators in developing strategies to keep experienced volunteers engaged.

Additionally, perceptions of specific activities, people, and resources (e.g., enjoyment, utility, frustration), sense of belonging to the project or group, and individual attributes (e.g., prior knowledge and skills) contribute to volunteer engagement (Phillips et al., 2019). Peter et al. (2021) investigated the connection of project characteristics to volunteers’ perceived gains in knowledge (e.g., biodiversity, environmental awareness) and skills (e.g., project-relevant species identification, data collection) among 838 participants in 48 community science projects across 10 countries. Peter et al. found volunteers perceived higher gains when they received interactive or multimedia online training (i.e., quiz, video) or in-person training. Volunteers also reported higher perceived gains when provided with more information about the project’s scientific background, goals, and progress, had opportunities to interact (i.e., in-person, social media) with other volunteers, project coordinators, and scientists, and received higher levels of feedback and recognition (Peter et al., 2021).

Research has shown that when community science participants have opportunities to receive individual feedback, it positively impacts their initial and ongoing learning and engagement (NASEM, 2018). In the United Kingdom project BeeWatch, van der Wal et al. (2016) found that providing automated feedback through an online platform enabled volunteers, including novices with little prior knowledge, to rapidly learn and expand their bee identification skills in both the training and data collection phases of the project. Wisniewski et al. (2020) suggest individual feedback can also positively impact motivation, persistence, and self-efficacy with learning

tasks, particularly when feedback is information-rich and helps individuals understand why their response was correct or incorrect. This supports Peter et al.'s (2021) findings indicating volunteers who frequently received individual feedback reported higher perceived gains in skills and knowledge compared to volunteers who received less frequent or no feedback. Feedback processes may be one means of helping volunteers feel supported and engaged in community science projects.

Engagement is a combination of personal and project-specific characteristics (Phillips et al., 2019). Frensley et al. (2017) investigated volunteers' engagement in a hybrid co-created community science program utilizing online learning modules with embedded quizzes, web-based concept mapping, and in-person events. Frensley et al. found volunteers felt the self-guided online training modules and embedded quizzes were challenging, time-consuming, and technical issues and unfamiliarity with the online tools created barriers that ultimately overcame their motivation to continue participating. Additionally, some volunteers reported the online training was socially isolating (Frensley et al., 2017). Bloom and Crowder (2020) explored engagement in two pollinator community science projects and found retention was higher when volunteers were asked to collect data on wild bees by observing nest boxes (70%) compared to having volunteers identify and record flower-visiting bees and bee-plant interactions using photography (6%). Bloom and Crowder's findings suggest if volunteers perceive data collection methods as too challenging or complex, it may negatively impact their motivation to persist beyond the training period. Although there is a tremendous amount of variety among community science projects, these studies illuminate how the design, implementation, and perceptions of specific program elements can impact volunteer engagement.

Given the multifaceted nature of engagement, Phillips et al. (2019) emphasize that variations in volunteer engagement are strongly influenced by each project's unique cultural and ecological context and design. Consequently, strategies for supporting engagement are diverse and range from project websites and resource repositories to in-person volunteer appreciation and training events. Although engagement strategies depend on the contextual factors of each project, recent studies show programs that design with the volunteer in mind likely yield a higher quality of work that benefits the research (Crall et al., 2013; Dickinson & Bonney, 2012). Additionally, programs incorporating an online volunteer forum and dedicated website may see higher retention rates and community-building (Clery, 2011). Phillips et al. (2019) recommend a better understanding of how adults engage and learn through community science programs, which can inform science learning in similar experiential contexts and support meaningful engagement among Extension professionals, researchers, community members, and other stakeholders (Desprez et al., 2020).

Native Bee Watch: Past and Present

Native Bee Watch's (NBW) mission is to engage the people of Colorado in supporting pollinator conservation through research and education. NBW is a contributory project and has four primary goals: (1) learn about bee population and abundance trends in Colorado, (2) understand bees' plant preferences, (3) support education and engagement so volunteers and their communities can make informed decisions regarding landscapes, and (4) support and assess adult learning through community science. All NBW volunteers are individuals who reside in Colorado during the program's annual data collection period, roughly late May through early September.

NBW's data collection protocol is a modified version of the Focal Plant Sampling Procedure (Altmann, 1974; Mason & Arathi, 2019) that groups bees into eight morphospecies categories (e.g., hairy leg bee, bumble bee, tiny dark bee). A monitoring session consists of at least one two-minute observation of an area of flowering plants no larger than two feet squared. Additional two-minute observations in the same session are discretionary and may depend on the availability of flowering plants in the monitoring area. Volunteers record the date, time, weather, and location for each monitoring session. For each two-minute observation within that session, volunteers record the name of the plants in the observation area, the approximate number of flowers on each plant, any pollinating bees observed in the eight morphospecies categories, and pollinating flies observed on the plants.

In-Person Program Model

From 2016 to 2019, NBW operated as a fully in-person program at four public gardens in Fort Collins and Littleton, CO. Recruitment efforts included advertising through social media, word-of-mouth, and email newsletters leveraging networks within Colorado State University and the City of Fort Collins. Volunteers received a program-specific field guide and attended a two-hour, in-person training focused on how to distinguish bees from other flying insects (e.g., flies and wasps), identifying bees to eight morphospecies categories, data accuracy and collection protocols, and the importance of the plant-pollinator relationship (Mason & Arathi, 2019). Training techniques included lecture, PowerPoint presentations, and examination of insect specimen boxes. Volunteers then spent a significant amount of time in public gardens learning to identify flower-visiting insects and conducted monitoring sessions under the mentorship of a university researcher, program coordinator, or an experienced volunteer. This one-on-one interaction contributed to peer learning and enabled novice volunteers to receive immediate feedback on their bee identification skills, resulting in high engagement from participants (88% average retention from 2016-2018), and a high level of accuracy in the ecological data collected compared to data collected by researchers (Mason & Arathi, 2019). In addition to field mentoring, volunteer support included e-newsletters, email communication, and an annual

volunteer appreciation event. During monitoring sessions, volunteers recorded data on a paper form which the program coordinator transferred to a Microsoft Excel spreadsheet.

Hybrid Program Model

In the spring of 2020, the COVID-19 pandemic prompted a rapid program redesign so NBW could be implemented virtually to comply with social distancing guidelines. The 2020 pandemic-adapted NBW program design leveraged a combination of technological supports to support field-based data collection. We used the same recruitment strategies for the hybrid model but expanded the reach to statewide audiences instead of concentrating locally. The initial volunteer training was offered twice via synchronous Zoom webinars, which were recorded and posted to YouTube for individuals who could not attend the live sessions. Training webinars covered the same content as prior years' in-person trainings but with greater emphasis on bee identification and data collection protocols. A missing component from the online trainings was the opportunity for volunteers to examine physical bee specimens. Before submitting data to the project, we required new volunteers to attend or view the training webinar and pass an online, open-resource Google Forms photo identification quiz with a score of 85% or better. The 50-question quiz focused on differentiating among bees, wasps, and flies and identifying bees into the eight morphospecies categories. The quality and clarity of the photos varied to represent what volunteers may see while monitoring. Volunteers received no additional feedback beyond whether their answers to questions were correct or incorrect. The quiz could be taken as many times as needed to reach 85% or higher.

After passing the quiz, volunteers monitored bees individually in their home gardens in areas with flowering plants. Given the size and plant variation in home gardens, volunteers determined how much time they wanted to devote to monitoring and how many two-minute observations to include in each monitoring session. For consistency, we asked volunteers to monitor the same plants through the entire bloom period and to monitor every other week at a minimum or once per week maximum. Rather than recording and submitting data through paper forms as in the in-person model, volunteers submitted data using a newly developed data collection form on Survey123, an ArcGIS Online platform, using either the mobile or desktop app. We provided a printable data collection template for volunteers wishing to record data on paper before uploading it to Survey123. Submitting photos from each monitoring session was highly encouraged but not required.

To support volunteers with their at-home monitoring, we created a password-protected resources webpage which provided a central location for volunteer resources such as links to the recorded trainings on YouTube, training presentation slides, identification field guides, and photo flashcards for self-study. Other supports included a monthly e-newsletter and a new Facebook group where volunteers could interact and post photos for identification assistance; to encourage engagement, program staff routinely posted educational content. Two supplemental webinars

were offered mid-season; a general Q&A session provided opportunities for volunteers to ask questions, share observations, and learn from other volunteers, and a pollination biology lecture framing the importance of pollinator population data.

Identifying bees is a challenging learning task, even in an in-person setting with the assistance of pollinator experts and ongoing field mentoring. Consequently, we anticipated transitioning to a model utilizing online instruction to teach field-based skills, and introducing a new online data collection tool may present challenges for volunteers. As such, supporting volunteers to feel confident with bee identification and the data collection protocols motivated the development of the one-stop resources webpage. Additionally, we recognized that monitoring at home may be isolating for some volunteers since research has shown that social interactions among community science volunteers, program staff, and scientists can contribute to higher levels of engagement (Peter et al., 2021; Phillips et al., 2019). Therefore, we utilized the Facebook group, email, Zoom, and supplemental webinars to encourage interactions among volunteers and program staff. Volunteer engagement, confidence, and retention were of primary importance for program staff in the transition from the in-person to the hybrid model. Our desire to provide a high-quality volunteer experience led us to conduct the study we present in this paper.

Purpose and Research Questions

The purpose of this mixed-methods survey-based study is to present the successes and challenges from the redesign of NBW from an in-person to a hybrid model as guided by the research questions:

1. What were new volunteers' motivations for participation?
2. How did new volunteers perceive the online training?
3. How did new volunteers perceive the bee monitoring experience, resources, and supports?

Methods

To capture the personal and scientific experiences of NBW new volunteers, this study's data collection included pre- and post-monitoring surveys, ecological data submitted by volunteers, volunteer participation data (e.g., quantity of participants, monitoring sessions, observations), and analytics from the Facebook group, e-newsletter, and recorded training webinars available on YouTube. All human subjects' data were collected in accordance with protocols approved by Colorado State University's Institutional Review Board.

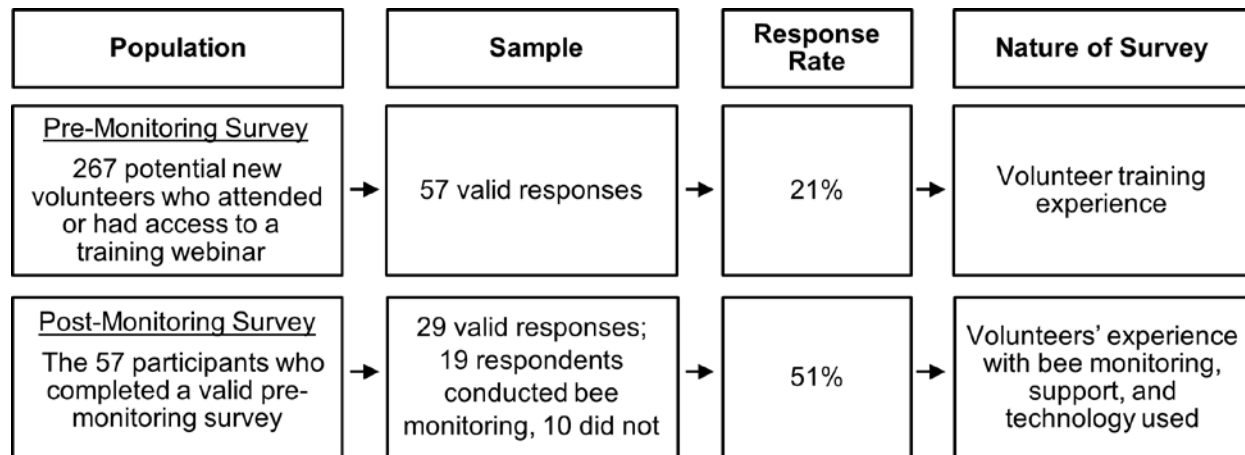
Participants and Data Collection

For the 2020 NBW season, we recruited new volunteers through Colorado State University Extension, the statewide Master Gardener program, and social media. Two 3-hour virtual

trainings were offered in late May 2020; 51 people attended the first training, and 159 people attended the second training. Sixty-nine people could attend neither and requested access to the recording for a total of 279 attending or viewing the training. Our goal was to assess the hybrid program design on new volunteers who had no prior experience in NBW's in-person model, so we considered participants to be eligible for this study if they (a) attended or viewed the 2020 online training webinar and (b) had not participated in NBW anytime from 2016–2019. Given these criteria, we removed 12 prior participants, leaving 267 potential new volunteers eligible to participate in this study.

After attending the training webinars in May 2020 and before the field monitoring season began in June 2020, we invited all 267 potential study participants to complete a pre-monitoring survey. The pre-monitoring survey addressed volunteer demographics, prior knowledge and skills, STEM content learned, possible associated conservation behaviors, and initial perceptions of the training process. Post-monitoring surveys were conducted in August and September 2020 at the end of the monitoring season. Only volunteers who completed the pre-monitoring survey were eligible to take the post-monitoring survey because we wanted to capture any differences in perception before and after the monitoring experience. The post-monitoring survey addressed volunteers' experience during the training and field monitoring, STEM content learned, possible associated conservation behaviors, motivation to volunteer and to return if applicable, and for respondents who never conducted bee monitoring, reasons why they dropped out after attending training.

In developing the surveys in Qualtrics, a secure online survey platform, we drew from a validated survey in environmental education (Vaske & Kobrin, 2001) to inform questions on environmentally responsible behaviors. The STEM topics list and qualities specific to NBW were collaboratively generated by education researchers and the program coordinator based on training content, knowledge, and skills necessary for conducting monitoring. Questions about motivation to participate and engagement supports were informed by prior studies on engagement (e.g., Domroese & Johnson, 2017; Phillips et al., 2019) and the program coordinator's interactions with volunteers in the prior in-person model. We pilot-tested the pre-and-post monitoring surveys with two summer interns who were new to NBW in 2020, attended the online training, and conducted monitoring. Figure 1 summarizes the data collection processes.

Figure 1. Participant Sampling and Data Collection Procedures

Data Analysis

We used descriptive statistics to analyze the frequency distributions of all variables from closed-ended questions on the pre-and-post monitoring surveys. For questions asking participants to rank items from most to least helpful (e.g., training components and field resources), we calculated and ordered the mean rank for each item from highest to lowest rank (1 = *highest possible rank*, 10 = *lowest possible rank*). On the pre-monitoring survey question asking participants to rank elements of the volunteer training, four respondents experienced a browser glitch prohibiting them from using the drag-and-drop feature, lowering this question's responses from 57 to 53. We used Likert-scale questions to ask participants about technology and program communications. For example, the question "How easy was it to use the Survey123 app on my mobile or tablet?" included the response options of *didn't use*, *very challenging*, *moderately challenging*, *moderately easy*, and *very easy*. For analysis, we coded Likert responses from one to five, corresponding to the choices *didn't use* and *very easy*.

We analyzed open-ended survey questions about the training, program resources and communication, and monitoring experience using a qualitative content analysis process (Merriam & Tisdell, 2016). We sorted and grouped responses based on the key content to build categories. In September 2020, we downloaded data analytics from the Facebook group, YouTube, and Constant Contact e-newsletter, survey data from Qualtrics, and monitoring session data from Survey123. We analyzed the YouTube data to assess engagement with the recorded trainings using guidance from YouTube Help (n.d.). Constant Contact analytics presented the number of individuals who received the e-newsletter, the percentage that opened the e-newsletter, and the percentage that clicked included links. Facebook data included the number of group participants and the frequency, time of day, reactions to (e.g., likes), and views of postings. We conducted descriptive analyses, including frequency distribution and mean, of the Facebook and monitoring sessions data in Excel and survey data in SPSS 26.

Results

We report results regarding new volunteers' experiences in the trainings, bee monitoring activities, and perceptions of program support. We focus on results that inform programmatic elements and volunteer engagement.

Of the 267 potential volunteers that participated in the live training or had access to the recording, 68 new volunteers followed through on data collection and were considered active volunteers. Additionally, 12 volunteers from prior years conducted monitoring for a total of 80 active volunteers in 2020, an increase of over 200% from the program's historic high of 25 volunteers in 2017. Monitoring locations expanded geographically from three or four public gardens to backyard gardens statewide, as shown in Figure 2, with a majority located in urban and heavily-populated areas. Figure 3 depicts volunteers' monitoring activity.

Figure 2. Monitoring Locations in 2020

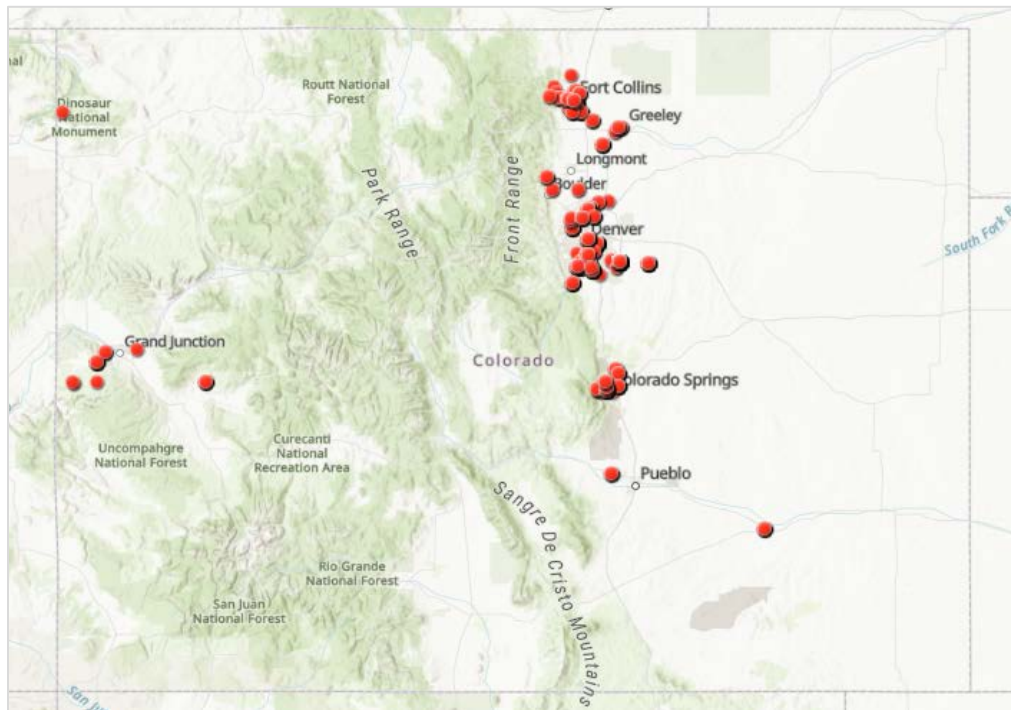
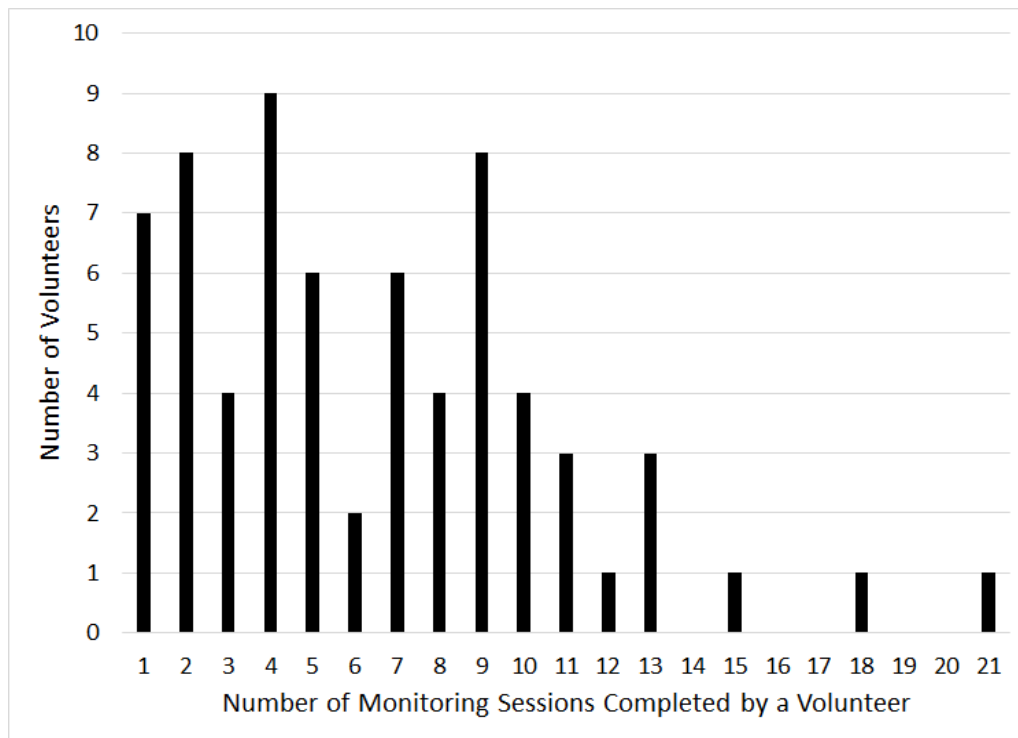


Figure 3. Number of Monitoring Sessions Completed by New Volunteers

Note. $N = 68$. The monitoring season was 12 weeks, from June through August; volunteers were asked to monitor approximately every other week. The mean number of completed sessions was 6.4.

Demographics and Motivation to Participate

In this section, we present results pertaining to the first research question and the characteristics of study participants. Most pre-monitoring respondents identified as female, white, 55 years or older, and possessing at least a bachelor's degree. Of those who reported annual household income, approximately 50% of respondents earn \$80,000 or more. Table 1 shows the respondents' demographics.

Table 1. Demographics of Pre-Monitoring Survey Respondents ($N = 57$)

Variable	Category	<i>n</i>	%
Gender	Female	48	84.2
	Male	9	15.8
Age	25-34	5	8.8
	35-44	5	8.8
	45-54	6	10.5
	55-64	17	29.8
	65-74	21	36.8
	75 or older	3	5.3

Variable	Category	<i>n</i>	%
Race/ethnicity			
	White	54	96.5
	Black/African American	1	1.8
	Asian/Pacific Islander	1	1.8
	Two or more	1	1.8
Household Income			
	\$30,000 to \$59,999	9	15.8
	\$60,000 to \$79,000	7	12.3
	\$80,000 to \$99,000	13	22.8
	\$100,000 or more	16	28.1
	Prefer not to specify	12	21.1
Highest education level completed			
	Some college credit, no degree	5	8.8
	Trade/vocational training	1	1.8
	Associates degree	1	1.8
	Bachelor's degree	19	33.3
	Master's degree	20	35.1
	Professional degree	4	7.0
	Doctorate degree	7	12.3

Table 2 presents the distribution of respondents' background attributes. Over 75% of participants reported prior knowledge or skills in gardening, plant identification, and identifying plants that attract bees. Write-in responses included membership in the Master Gardener program ($n = 4$) and prior exposure to beekeeping through family or neighbors ($n = 4$).

Table 2. Attributes of Pre-Monitoring Survey Respondents: Prior Knowledge or Skills ($N = 57$)

Variable	<i>n</i>	%
Gardening experience	51	89.5
Plant identification skills	44	77.2
Identifying plants that attract bees	43	75.4
Professional data collection experience	27	47.4
Pollinator habitat or related experience	25	43.9
Professional experience in science	24	42.1
Distinguishing bees from other flying insects	20	35.1
Other (write in)	14	24.6
Teaching background in science	13	22.8
Bee keeping experience	12	21.1
Participated in other citizen science projects	11	19.3

Note. Respondents were able to multi-select. Frequencies and percentages reflect respondents who answered *yes* to this question.

Post-monitoring survey respondents who conducted monitoring indicated their motivations for participation reflected a desire to learn something new, concern for bee populations, and a desire

to participate in bee conservation and scientific endeavors (Table 3). Write-in responses included earning Master Gardener hours ($n = 3$) and wanting to observe which home-garden plants bees prefer ($n = 2$).

Table 3. Motivation for Participation in NBW ($N = 19$)

Motivation	<i>n</i>	%
To learn something new	19	100
I enjoy participating in science	15	78.9
I like contributing to bee conservation efforts	14	68.9
I'm concerned about the bee population decline	13	68.4
I love bees	6	31.6
Other (write-in)	6	32.6
I wanted to spend time outdoors	4	21.1
To get out of the house	4	21.1
To connect with other people in my community	2	10.5

Note. Post-monitoring respondents. Respondents were able to multi-select.

For the 10 post-monitoring survey respondents who dropped out of the project after attending the training, the most reported reasons for non-participation were (a) low comfort or difficulties with using Survey123 to submit data ($n = 3$), (b) low confidence in their identification skills ($n = 3$), and (c) inability to pass the required training quiz ($n = 2$). Of the 19 post-monitoring survey respondents who conducted bee monitoring, 89.9% reported they plan to volunteer in 2021. When given the option to write in factors potentially influencing their decision to volunteer in the future, responses included available free time and whether the program will be offered in-person or in the current hybrid format. However, preference for either program format was not indicated. While one respondent reported they would like to monitor with fellow volunteers, several others stated they hope to continue monitoring in their home gardens because being required to monitor in designated public gardens may present a barrier, depending on the garden's location.

Perceptions of the Online Training

In this section, we present results pertaining to the second research question. The recorded volunteer training available on YouTube had 124 views. The most-viewed sections were distinguishing a bee from a fly or wasp and identifying categories of bees. The second most-viewed section was on submitting data using Survey123.

Both pre-and post-monitoring survey respondents were asked to rank discrete elements of the volunteer training from most helpful to least helpful in preparing them to monitor bees, shown in Table 4. Volunteers reported the most helpful training components were those designed to provide and assess knowledge on bee and insect identification; the least helpful aspects were unrelated to the monitoring process but provided background information on pollinators and the

program. Interestingly, the video monitoring demonstration was ranked as less helpful post-monitoring compared to pre-monitoring.

The pre-monitoring survey included an open-ended question asking volunteers to offer suggestions for future trainings. The most common themes were (a) incorporating more information and practice time on bee and insect identification (e.g., practice quizzes, having an expert model bee identification), (b) increased diversity and quality of visual materials (i.e., bee photos or videos), (c) an in-person mentor, and (d) breaking the training into smaller modules (e.g., multiple shorter sessions). In general, pre-monitoring respondents provided positive feedback about their training experience. For example, one volunteer wrote, “I’ve already enjoyed being able to identify different kinds of bees that I didn’t know existed before.” Another participant related,

The training was great! Going into the training, I knew very little about native bees and how to distinguish them from honey bees, wasps and flies. I came out of the training feeling pretty confident that I will be able to apply what I’ve learned during my observation sessions and identify what I see correctly.

Although these responses were submitted prior to conducting bee monitoring, they demonstrate participants felt the training supported their learning and preparation for monitoring.

Table 4. Most and Least Helpful Elements of Volunteer Training

Element	Pre-Monitoring Mean Rank	Post-Monitoring Mean Rank
Lecture on identifying bees and other similar insects	1.45	1.26
Practicing identification using photos in the PPT	3.68	3.58
Studying the <i>NBW Citizen Science Field Guide</i>	4.30	3.42
Practice quiz	4.57	4.37
Lecture on data collection tools/procedures	5.89	5.89
Outdoor demo of monitoring session by facilitator	5.91	7.26
Lecture on pollination	6.30	6.47
Lecture on reasons for pollinator decline	7.13	7.21
Update on how the data has been used and the future direction of NBW	7.55	7.89
Structured Q&A through the chat box	8.23	7.63

Note. Pre-monitoring respondents, $N = 53$. Post-monitoring respondents, $N = 19$. 1 = *most helpful*, 10 = *least helpful*.

After the initial volunteer training, participants were required to pass an online quiz before monitoring. All 19 post-monitoring respondents who were active volunteers reported they successfully passed the quiz, with the majority (52.6%) needing two attempts. All volunteers responded “yes” when asked if the quiz was helpful in learning to identify insects.

Perceptions of the Bee Monitoring Experience, Resources, and Supports

In this section, we present results from the post-monitoring survey pertaining to the third research question. Several questions to capture the experiences of volunteers who conducted monitoring inquired how volunteers used and perceived field and technology resources, communication channels with NBW, and volunteers. As shown in Table 5, volunteers perceived the field guide (Mason et al., 2018) and a camera as being the most useful field resources. Write-in responses for the *other* category included binoculars and asking questions via email.

A variety of resources were available on the NBW website to support volunteers. Volunteers reported the website and volunteer resource webpage were either *moderately easy* (42.1%) or *very easy* (52.6%) to use ($N = 19$; one respondent indicated they used neither resource). Additionally, NBW utilized several technology applications during the trainings and for data collection. The majority of volunteers indicated using Zoom to attend the volunteer training webinars was *very easy* (84.2%), with only 5.3% of volunteers reporting it was either *moderately easy* or *moderately challenging*, respectively ($N = 19$, with one respondent indicating they did not use Zoom). Volunteers reported using Survey123 to submit monitoring data was mostly *very easy*, with slightly higher ease of use on the computer desktop (42%) compared to a mobile device (32%). Of those volunteers who found using Survey123 *moderately challenging*, most reported using the application on their mobile device (16%) instead of a desktop computer (5%; $N = 19$).

Table 5. Most and Least Helpful Field Resources ($N = 19$)

Resource	Mean Rank
NBW Citizen Science Field Guide	1.63
Camera to take pictures	2.89
Bee size comparison guide	5.00
Recorded webinars	5.32
NBW Facebook group	5.79
Internet	5.84
The book <i>Bees in Your Backyard</i>	6.16
Magnifying glass	6.16
Working one-on-one with partner	7.74
Other	8.47

Note. Post-monitoring respondents. 1 = *most helpful*, 10 = *least helpful*.

NBW sent a monthly e-newsletter to all volunteers during the active monitoring season (June through August), which included reminders, monitoring tips, and educational information. The majority of volunteers reported not receiving the e-newsletter (26%) or finding it *very* (16%) or *moderately unhelpful* (31%, $N = 19$).

When asked if they received enough communication and support from program leaders, 63% of volunteers indicated *yes*, and 37% responded *no* ($N = 19$). Write-in suggestions for improving communication and volunteer support included immediate and direct feedback on volunteers’ data submissions, more information posted in the Facebook group, and facilitated weekly Q&A Zoom meetings during the first several weeks of monitoring.

In general, volunteers who completed the post-monitoring survey indicated a positive overall experience. Table 6 presents representative participant quotes.

Table 6. Write-in Responses from NBW Volunteers on Overall Experience ($N = 19$)

Category	Example Quote
Knowledge	What an enriching learning experience this has been! My awareness, and appreciation of the role of pollinators in the food chain, has increased ten-fold.
Meaningful contribution	I really liked doing this, it was super helpful and I felt like I was contributing in a meaningful way.
Nature appreciation	It has enhanced my pleasure at being able to see the diversity of bees and other pollinators as I walk or sit among the plant life they touch. I am in awe.
Master Gardener	I’m an CMG. ... A native bee presentation should be a class for CMG’s and apprentices. For me, learning about bees made my work as a gardener complete.

Note. Post-monitoring respondents.

Discussion

Based on this study’s results, the rapid transition from an in-person to a hybrid program model was successful in retaining and engaging volunteers. Insight into volunteers’ perceptions and experiences in the hybrid format contextualizes our successes and challenges, provide a baseline for program development, and contributes to scholarship on engagement in community science.

Successes and Opportunities

Key successes and opportunities created by the hybrid model included reaching a broader spatial (statewide) scale as opposed to the localized monitoring previously and retaining a greater number of active volunteers (80) than in prior years’ in-person model. Among the 68 new active volunteers, the majority completed four or more monitoring sessions over 12 weeks, suggesting that most volunteers were able to overcome initial challenges with learning to identify and monitor bees. This was a major success since the level of challenge and complexity in pollinator species identification and data collection can contribute to low volunteer retention (Bloom & Crowder, 2020; Klienke et al., 2018), and volunteers did not have the benefit of in-person mentoring to assist with initial difficulties.

The online training was available at no cost to potential volunteers and was offered in a live and recorded format, resulting in a high number of interested participants. Although many attendees opted not to become active volunteers after the training, the high level of participation in the online training suggests there is great interest in learning about bees and pollinator conservation among Colorado residents and aligns with volunteers' motivations for participating in NBW and similar pollinator community science projects (e.g., Bloom & Crowder, 2020; Domroese & Johnson, 2017). In future years, training attendees who never conduct monitoring should be surveyed so program staff can assess barriers to participation and develop appropriate strategies.

Research indicates that volunteers' prior knowledge, skills, and experiences contribute to engagement in community science (Phillips et al., 2019) and informal science learning (Falk & Dierking, 2019). NBW was able to successfully leverage existing networks to recruit volunteers with established interests or experience in project-relevant activities. Additionally, the demographics and locations of NBW volunteers reflect broader trends in community science participation, namely that volunteers are primarily white, well-educated, older in age, and middle to upper class (NASEM, 2018). Furthermore, pollinator community science programs skew heavily towards urban centers where participants tend to be highly educated (Mason & Arathi, 2019), and the locations of NBW monitoring sessions lend support to this trend. The hybrid format afforded greater accessibility for volunteer participation, yet opportunities exist to expand recruitment efforts to non-urban areas and groups underrepresented in community science.

Survey results indicated new volunteers found the trainings valuable and interesting. For future trainings, instead of a 2-hour webinar, breaking the content into shorter pre-recorded videos may be beneficial and would enable volunteers to access specific information throughout the project. Providing short, on-demand, just-in-time training can support volunteers' species identification skills and data accuracy (Katrak-Adefowara et al., 2020). Furthermore, educational videos of ten minutes or less align with Extension best practices (Dev et al., 2018), and recent research indicates recordings of one-hour webinars are, on average, rewatched for only 12 minutes (Barnes et al., 2021), suggesting viewers are navigating to segments most relevant to their immediate needs. Since analytics of the recorded NBW training showed volunteers primarily viewed sections on bee identification and data entry, creating short stand-alone videos to address these specific skills and making them available on the project website may support volunteers' initial and ongoing engagement.

The availability and format of program information and resources can impact volunteer engagement (Peter et al., 2021), and the hybrid model provided the impetus to build a single repository for all the NBW community science resources on the project website. This wealth of resources, and the ability to revisit information that had previously only been available in person, was a success and reduced the number of routine questions directed to staff. As a result, volunteers may have had less interactions with program staff through email or other means. This highlights the need to incorporate opportunities for interactions among volunteers and program

staff as an engagement strategy to build comradery and confidence in project-related skills (Peter et al., 2021; Phillips et al., 2019). For example, facilitating weekly Zoom sessions was a write-in suggestion for improved communication and support from program staff. Since the primary motivations of NBW volunteers are to learn something new and participate in science, prioritizing continuing education may be an effective strategy for volunteer engagement and retention. In future iterations of the hybrid model, NBW staff should consider using recorded webinars and resources from related Extension programming to supplement continuing education needs. Making available in-person training, hands-on identification workshops, and peer-mentoring between new and experienced volunteers to improve identification accuracy (Freitag et al., 2016)) could also supplement online learning and support volunteer engagement (Frensley et al., 2017; Peter et al., 2021; Phillips et al., 2019).

For active volunteers, the most useful resources were the pre-monitoring quiz and the field guide. Although the quiz was designed to assess insect identification skills prior to submitting data to the project, research shows that quizzing is also a powerful learning tool (Roediger et al., 2011). Opportunities exist to leverage research from the learning sciences to support volunteers' identification skills (e.g., Wahlheim et al., 2011) in hybrid programs where species identification is initially learned through photos and then transferred to a field setting. Wahlheim et al. (2011) suggest that using photo training can support volunteers' ability to distinguish among the key characteristics of species, which aligns with the data protocols of NBW and other pollinator community science programs (e.g., Bloom & Crowder, 2020; Domroese & Johnson, 2017). While volunteers reported the quiz was helpful, findings from the open-ended survey questions indicate volunteers desire more information and practice time with bee identification. Utilizing an online platform that can provide immediate detailed feedback on quiz responses and creating more opportunities for identification practice with feedback may further enhance volunteer engagement (Peter et al., 2021).

Finally, volunteers expressed enjoyment in learning about their own yards and natural spaces, as opposed to the public gardens in previous years. They perceived this project helped them feel more connected to their own yards and take positive advantage of pandemic-imposed restrictions. Research exploring the role of place in community science volunteers' motivation and engagement is growing (e.g., Newman et al., 2017; Phillips et al., 2019), and future research should investigate how project activities utilizing public and private place connections impact engagement.

Challenges and Recommendations for Future Programs

Technology was an advantage, but it also presented a barrier for some volunteers. Training required videoconferencing software, data submission required a mobile app or desktop computer, and engagement with program personnel or other volunteers required email or Facebook access. Yet, similar to the findings of Frensley et al. (2017), volunteers' technology

skills were highly varied, and not everyone was comfortable with technology-mediated project activities. Technology is becoming increasingly integrated into community science, and future work should address accessibility by considering internet access and technology skills.

The amount and type of information available to volunteers can impact engagement (Peter et al., 2021), and e-newsletters can be an effective tool to communicate with volunteers (Erikson & Hansen, 2012). However, survey results indicated most volunteers did not receive the newsletter or did not find it helpful, suggesting a mismatch between the intent of the newsletter and its perceived utility to volunteers. An ongoing challenge for NBW is staff capacity for generating project communications. Newsletters can be time-consuming to create, and volunteers and staff may rate the relevancy of included information differently (Peter et al., 2021). Further investigation is needed to understand what newsletter content would be helpful to active volunteers versus individuals with a general interest in NBW, such as individuals who attended a volunteer training but never conducted bee monitoring.

Lastly, although the challenge of learning to identify bees and collect observational data resulted in some volunteers leaving the program, NBW fills a much-needed gap in pollinator population monitoring research. Traditionally, research on bee populations entails collecting specimens to fully understand species-level populations and health. However, there are several challenges associated with this method, including a lack of personnel with the required taxonomic expertise, overcoming sampling biases from current capture methods (e.g., pan traps, vane traps, netting), securing the needed funding and resources to process and store specimens, running the risk of over-collecting, and abiding by collecting restrictions for endangered or at-risk species (Portman et al., 2020; Woodward et al., 2020).

Observational data collected through community science volunteers can build capacity and provide additional data about bee populations without the challenges associated with specimen collecting (Birkin & Goulson, 2015). Furthermore, popular online community science platforms such as iNaturalist are experiencing data backlogs since only 7% of users participate as identifiers (i.e., volunteers with the skills and ability to make informed identifications from photos) compared to the 92% of users who only upload photo observations without providing an identification (Callaghan et al., 2022). This backlog highlights the importance and need for programs like NBW that train and support volunteers to collect pollinator population data through observational methods. Although it can be challenging for non-scientists to grasp the larger picture of population monitoring research, clearly communicating the importance of observational data and the scientific niche it fills could support engagement (Peter et al., 2021) for new and long-term community science volunteers who have strong scientific motivations. NBW should consider developing data visualizations for the project website as a way to recognize volunteers and contextualize their scientific contributions.

Implications for Extension Programming

Extension strives to stay relevant and increase engagement with local communities (Reed et al., 2015). Community science can be one method for Extension to connect with their constituents on locally-relevant issues (Desprez et al., 2020). The successes and challenges presented here can be applicable to other issues Extension aims to address, including climate change, water quality, invasive species detection, food systems, and agriculture (Cooper et al., 2014; Ryan et al., 2018).

The recent Colorado Community Needs Assessment conducted by Extension indicated that sustainable landscapes, outdoor education, and yard/garden management continue to be high-priority needs in the state (L. Mason, personal communication, December 2021). With decreasing budgets in Extension and university resources, community science projects can leverage capacity through existing Extension infrastructure, such as volunteer management systems for administration, website and communication tools, and education resources. Like NBW, utilizing current volunteer programs as recruitment networks, such as Master Gardener, Master Naturalists, and 4-H, is an opportunity for any Extension community science project because volunteers are already connected through Extension networks and have exposure to science-based learning (Clyde et al. 2018). Extension can also leverage its history of collaborating with established partnerships, community members, and research faculty to provide a strong foundation for community science programs (Clyde et al., 2018). Additionally, because of its presence in each county, Extension can help community science programs connect with volunteers in non-urban areas where there is an established need for pollinator community science programs (Mason & Arathi, 2019). This study's results regarding program design and volunteer engagement can inform Extension and community science programs elsewhere.

Conclusion

Volunteers are the heart of community science. While the pandemic was disruptive in countless ways, the opportunity to move NBW to a hybrid format enabled greater participation from a wider range of Colorado locations. The transition to a hybrid program was partially successful because NBW was housed within Extension and leveraged Extension resources and recruitment networks. Our study informs the development of NBW and similar community science and Extension programs. It illuminates ways staff can better support volunteers with field-based tasks through online training, resources, and engagement strategies. By focusing on engagement, we aim to recruit, retain, and better position volunteers to make informed decisions about their own landscape and advocate for bee conservation in their communities.

References

- Altman, J. (1974). Observation study of behavior: Sampling methods. *Behaviour*, 49(3/4), 227–266. <http://www.jstor.org/stable/4533591>
- Aristeidou, M., Herodotou, C., Ballard, H. L., Higgins, L., Johnson, R. F., Miller, A. E., Young, A. N., & Robinson, L. D. (2021). How do young community and citizen science volunteers support scientific research on biodiversity? The case of iNaturalist. *Diversity*, 13(7), Article 318. <https://doi.org/10.3390/d13070318>
- Barnes, E. E., Usborne, R., Stone, A., & Sadof, C. S. (2021). Lessons from a 10-yr invasive species webinar program: Emerald ash borer university. *Environmental Entomology*, 50(3), 505–513. <https://doi.org/10.1093/ee/nvab002>
- Birkin, L., & Goulson, D. (2015). Using citizen science to monitor pollination services: Citizen science and pollination services. *Ecological Entomology*, 40(S1), 3–11. <https://doi.org/10.1111/een.12227>
- Bloom, E. H., & Crowder, D. W. (2020). Promoting data collection in pollinator citizen science projects. *Citizen Science: Theory and Practice*, 5(1), Article 3. <https://doi.org/10.5334/cstp.217>
- Bonney, R., Phillips, T. B., Ballard, H. L., & Enck, J. W. (2016). Can citizen science enhance public understanding of science? *Public Understanding of Science*, 25(1), 2–16. <https://doi.org/10.1177/0963662515607406>
- Callaghan, C. T., Mesaglio, T., Ascher, J. S., Brooks, T. M., Cabras, A. A., Chandler, M., Cornwell, W. K., Cristóbal Ríos-Málaver, I., Dankowicz, E., Urfi Dhiya'ulhaq, N., Fuller, R. A., Galindo-Leal, C., Grattarola, F., Hewitt, S., Higgins, L., Hitchcock, C., James Hung, K.-L., Iwane, T., Kahumbu, P., ... Young, A. N. (2022). The benefits of contributing to the citizen science platform iNaturalist as an identifier. *PLOS Biology*, 20(11), Article e3001843. <https://doi.org/10.1371/journal.pbio.3001843>
- Carr, A. J. L. (2004). Policy reviews and essays. *Society & Natural Resources*, 17(9), 841–849. <https://doi.org/10.1080/08941920490493846>
- Chandler, M., Rullman, S., Cousins, J., Esmail, N., Begin, E., Venicx, G., Eisenberg, C., & Studer, M. (2017). Contributions to publications and management plans from 7 years of citizen science: Use of a novel evaluation tool on Earthwatch-supported projects. *Biological Conservation*, 208(April 2017), 163–173. <https://doi.org/10.1016/j.biocon.2016.09.024>
- Clery, D. (2011). Galaxy zoo volunteers share pain and glory of research. *Science*, 333(6039), 173–175. <https://doi.org/10.1126/science.333.6039.173>
- Clyde, M., Eberhardt, A., Prysby, M., & Stofer, K. (2018). Untapped: Accessing Extension to strengthen connections between citizen science and community decision making. *Journal of Extension*, 56(5), Article 19. <https://tigerprints.clemson.edu/joe/vol56/iss5/19>
- Cooper, C. B., Shirk, J., & Zuckerberg, B. (2014). The invisible prevalence of citizen science in global research: Migratory birds and climate change. *PLoS ONE*, 9(9), Article e106508. <https://doi.org/10.1371/journal.pone.0106508>

- Crall, A. W., Jordan, R., Holfelder, K., Newman, G. J., Graham, J., & Waller, D. M. (2013). The impacts of an invasive species citizen science training program on participant attitudes, behavior, and science literacy. *Public Understanding of Science*, 22(6), 745–764.
<https://doi.org/10.1177/0963662511434894>
- Danielsen, F., Burgess, N. D., & Balmford, A. (2005). Monitoring matters: Examining the potential of locally-based approaches. *Biodiversity & Conservation*, 14(11), 2507–2542.
<https://doi.org/10.1007/s10531-005-8375-0>
- Desprez, J., Russell, M., Strauss, A. L., & Meyer, N. (2020). Gathering perceptions to strengthen program planning: A citizen science project highlighting deer impacts on vegetation. *Journal of Extension*, 58(2), Article 12. <https://tigerprints.clemson.edu/joe/vol58/iss2/12>
- Dev, D. A., Blitch, K. A., Hatton-Bowers, H., Ramsay, S., & Garcia, A. S. (2018). How to create videos for Extension education: An innovative five-step procedure. *Journal of Extension*, 56(2), Article 19. <https://tigerprints.clemson.edu/joe/vol56/iss2/19>
- Dickinson, J. L., & Bonney, R. (Eds.). (2012). *Citizen science: Public participation in environmental research*. Cornell University Press.
<https://doi.org/10.7591/cornell/9780801449116.001.0001>
- Domroese, M. C., & Johnson, E. A. (2017). Why watch bees? Motivations of citizen science volunteers in the Great Pollinator Project. *Biological Conservation*, 208(April 2017), 40–47. <https://doi.org/10.1016/j.biocon.2016.08.020>
- Erickson, L., & Hansen, L. (2012). E-newsletters: A simple way to integrate technology with Extension programming. *Journal of Extension*, 50(6), Article 32.
<https://tigerprints.clemson.edu/joe/vol50/iss6/32>
- Falk, J. H., & Dierking, L. D. (2019). Reimagining public science education: The role of lifelong free-choice learning. *Disciplinary and Interdisciplinary Science Education Research*, 1, Article 10. <https://doi.org/10.1186/s43031-019-0013-x>
- Follett, R., & Strezov, V. (2015). An analysis of citizen science based research: Usage and publication patterns. *PLoS ONE*, 10(11), e0143687.
<https://doi.org/10.1371/journal.pone.0143687>
- Freitag, A., Meyer, R., & Whiteman, L. (2016). Strategies employed by citizen science programs to increase the credibility of their data. *Citizen Science: Theory and Practice*, 1(1), Article 2. <https://doi.org/10.5334/cstp.6>
- Frensley, T., Crall, A., Stern, M., Jordan, R., Gray, S., Prysby, M., Newman, G., Hmelo-Silver, C., Mellor, D., & Huang, J. (2017). Bridging the benefits of online and community supported citizen science: A case study on motivation and retention with conservation-oriented volunteers. *Citizen Science: Theory and Practice*, 2(1), Article 4.
<https://doi.org/10.5334/cstp.84>
- Friedman, A. J. (Ed.). (2008). *Framework for evaluating impacts of informal science education projects*. National Science Foundation, Directorate for Education and Human Resources, Division of Research on Learning in Formal and Informal Setting.
https://www.informalscience.org/sites/default/files/Eval_Framework.pdf

- Gallai, N., Salles, J.-M., Settele, J., & Vaissière, B. E. (2009). Economic valuation of the vulnerability of world agriculture confronted with pollinator decline. *Ecological Economics*, 68(3), 810–821. <https://doi.org/10.1016/j.ecolecon.2008.06.014>
- Goulson, D., Nicholls, E., Botias, C., & Rotheray, E. L. (2015). Bee declines driven by combined stress from parasites, pesticides, and lack of flowers. *Science*, 347(6229), 1255957. <https://doi.org/10.1126/science.1255957>
- Katrak-Adefowora, R., Blickley, J. L., & Zellmer, A. J. (2020). Just-in-time training improves accuracy of citizen scientist wildlife identifications from camera trap photos. *Citizen Science: Theory and Practice*, 5(1), Article 8. <http://doi.org/10.5334/cstp.219>
- Kleinke, B., Prajzner, S., Gordon, C., Hoekstra, N., Kautz, A., & Gardiner, M. (2018). Identifying barriers to citizen scientist retention when measuring pollination services. *Citizen Science: Theory and Practice*, 3(1), Article 2. <http://doi.org/10.5334/cstp.99>
- Lewenstein, B. V. (2015). Identifying what matters: Science education, science communication, and democracy. *Journal of Research Science Teaching*, 52(2), 253–262. <https://doi.org/10.1002/tea.21201>
- Mason, L., & Arathi, H. S. (2019). Assessing the efficacy of citizen scientists monitoring native bees in urban areas. *Global Ecology and Conservation*, 17(January 2019), Article e00561. <https://doi.org/10.1016/j.gecco.2019.e00561>
- Mason, L., Kondratieff, B., & Arathi, H. S. (2018). *Native Bee Watch: A Colorado citizen science field guide*. Colorado State University. https://arapahoe.extension.colostate.edu/wp-content/uploads/sites/10/2022/03/NBW_CitSci_FieldGuide_LowRez.pdf
- McCallie, E., Bell, L., Lohwater, T., Falk, J. H., Lehr, J. L., Lewenstein, B. V., Needham, C., & Wiehe, B. (2009). *Many experts, many audiences: Public engagement with science and informal science education. A CAISE inquiry group report*. Center for Advancement of Informal Science Education (CAISE). <https://www.informalscience.org/sites/default/files/PublicEngagementwithScience.pdf>
- Merriam, S. B., & Tisdell, E. J. (2016). *Qualitative research: A guide to design and implementation* (4th ed.). Jossey-Bass.
- National Academies of Sciences, Engineering, and Medicine. (2018). *Learning through citizen science: Enhancing opportunities by design*. The National Academies Press. <https://doi.org/10.17226/25183>
- National Research Council. (2007). *Status of pollinators in North America*. National Academy of Sciences, Committee on the Status of Pollinators in North America.
- Newman, G., Chandler, M., Clyde, M., McGreavy, B., Haklay, M., Ballard, H., Gray, S., Scarpino, R., Hauptfeld, R., Mellor, D., & Gallo, J. (2017). Leveraging the power of place in citizen science for effective conservation decision making. *Biological Conservation*, 208(April 2017), 55–64. <https://doi.org/10.1016/j.biocon.2016.07.019>
- Ottinger, G. (2010). Buckets of resistance: Standards and the effectiveness of citizen science. *Science, Technology, & Human Values*, 35(2), 244–270. <https://doi.org/10.1177/0162243909337121>

- Peter, M., Diekötter, T., Kremer, K., & Höffler, T. (2021) Citizen science project characteristics: Connection to participants' gains in knowledge and skills. *PLoS ONE* 16(7), Article e0253692. <https://doi.org/10.1371/journal.pone.0253692>
- Phillips, T., Bonney, R., & Shirk, J. L. (2012). What is our impact? Toward a unified framework for evaluating outcomes of citizen science participation. In J. L. Dickinson & R. Bonney (Eds.), *Citizen science: Public participation in environmental research* (pp. 82–96). Cornell University Press. <https://doi.org/10.7591/cornell/9780801449116.003.0006>
- Phillips, T. B., Ballard, H. L., Lewenstein, B. V., & Bonney, R. (2019). Engagement in science through citizen science: Moving beyond data collection. *Science Education*, 103(3), 665–690. <https://doi.org/10.1002/sce.21501>
- Pocock, M. J. O., Tweddle, J. C., Savage, J., Robinson, L. D., & Roy, H. E. (2017). The diversity and evolution of ecological and environmental citizen science. *PLoS One*, 12(4), Article e0172579. [10.1371/journal.pone.0172579](https://doi.org/10.1371/journal.pone.0172579)
- Portman, Z. M., Bruninga-Socular, B., & Cariveau, D. P. (2020). The state of bee monitoring in the United States: A call to refocus away from bowl traps and towards more effective methods. *Annals of the Entomological Society of America*, 113(5), 337–342. <https://doi.org/10.1093/aesa/saaa010>
- Reed, S. A., Swanson, L., & Schlutt, F. (2015). Timberline manifesto: Seven concepts linking Extension and engagement. *Journal of Extension*, 53(4), Article 20. <https://tigerprints.clemson.edu/joe/vol53/iss4/20>
- Reid, R. S., Nkedianye, D., Said, M. Y., Kaelo, D., Neselle, M., Makui, O., Onetu, L., Kiruswa, S., Kamuaru, N. O., Kristjanson, P., Ogutu, J., BurnSilver, S. B., Goldman, M. J., Boone, R. B., Galvin, K. A., Dickson, N. M., & Clark, W. C. (2016). Evolution of models to support community and policy action with science: Balancing pastoral livelihoods and wildlife conservation in savannas of East Africa. *Proceedings of the National Academy of Sciences*, 113(17), 4579–4584. <https://doi.org/10.1073/pnas.0900313106>
- Roediger, H. L., III, Putnam, A. L., & Smith, M. A. (2011). Ten benefits of testing and their applications to educational practice. In J. P. Mestre & B. H. Ross (Eds.), *Psychology of learning and motivation* (Vol. 55, pp. 1–36). Academic Press. <https://doi.org/10.1016/B978-0-12-387691-1.00001-6>
- Ryan, S. F., Adamson, N. L., Aktipis, A., Andersen, L. K., Austin, R., Barnes, L., Beasley, M. R., Bedell, K. D., Briggs, S., Chapman, B., Cooper, C. B., Corn, J. O., Creamer, N. G., Delborne, J. A., Domenico, P., Driscoll, E., Goodwin, J., Hjarding, A., Hulbert, J. M., ... Dunn, R. R. (2018). The role of citizen science in addressing grand challenges in food and agriculture research. *Proceedings of the Royal Society B: Biological Sciences*, 285(1891), Article 20181977. <https://doi.org/10.1098/rspb.2018.1977>
- Shirk, J. L., Ballard, H. L., Wilderman, C. C., Phillips, T., Wiggins, A., Jordan, R., McCallie, E., Minarchek, M., Lewenstein, B. V., Krasny, M. E., & Bonney, R. (2012). Public participation in scientific research: A framework for deliberate design. *Ecology and Society*, 17(2), Article 29. <http://dx.doi.org/10.5751/ES-04705-170229>

- U.S. Census Bureau (n.d.). *Press kit: County and metro area population estimates*. Retrieved February 3, 2021, from https://www.census.gov/newsroom/press-kits/2015/20150326_popestimates.html
- U.S. General Services Administration. (2020). *About CitizenScience.gov*. <https://www.citizenscience.gov/about/#>
- van der Wal, R., Sharma, N., Mellish, C., Robinson, A., & Siddharthan, A. (2016). The role of automated feedback in training and retaining biological recorders for citizen science. *Conservation Biology*, 30(3), 550–561. <https://doi.org/10.1111/cobi.12705>
- Vaske, J. J., & Kobrin, K. C. (2001). Place attachment and environmentally responsible behavior. *The Journal of Environmental Education*, 32(4), 16–21. <https://doi.org/10.1080/00958960109598658>
- Wahlheim, C. N., Dunlosky, J., & Jacoby, L. L. (2011). Spacing enhances the learning of natural concepts: An investigation of mechanisms, metacognition, and aging. *Memory & Cognition*, 39, 750–763. <https://doi.org/10.3758/s13421-010-0063-y>
- Wisniewski, B., Zierer, K., & Hattie, J. (2020). The power of feedback revisited: A meta-analysis of educational feedback research. *Frontiers in Psychology*, 10, Article 3087. <https://doi.org/10.3389/fpsyg.2019.03087>
- Woodard, S. H., Federman, S., James, R. R., Danforth, B. N., Griswold, T. L., Inouye, D., McFrederick, Q. S., Morandin, L., Paul, D. L., Sellers, E., Strange, J. P., Vaughan, M., Williams, N. M., Branstetter, M. G., Burns, C. T., Cane, J., Cariveau, A. B., Cariveau, D. P., Childers, A., ... Wehling, W. (2020). Towards a US national program for monitoring native bees. *Biological Conservation*, 252(December 2020), Article 108821. <https://doi.org/10.1016/j.biocon.2020.108821>
- YouTube Help. (n.d.). *Analyze performance with analytics*. https://support.google.com/youtube/topic/9257532?hl=en&ref_topic=9257610

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Opportunities for Competency Support of Virginia Cooperative Extension Professionals at the Colleague Stage

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This study focused on the professional development needs of Cooperative Extension agents and specialists with between four and seven years of experience, placing them roughly within the colleague career stage. Data were collected through focus groups and validated through member checking and the use of a modified World Café approach. A research team collaborated, increasing the reliability of the findings through intentional reflection in the development of the findings. Areas of competency strength and weakness vary for agents and specialists, and specific topic areas within competencies vary. While many of the emergent competencies identified in this study fit within the competency framework of Harder et al. (2011) and previous competency studies, more specific topic areas were identified. However, the top priorities identified for professional development focus included communication, educational design, leadership, and budget and fiscal management. Attention to these areas can increase the ability of these professionals to work more effectively and productively. Providing professional development in areas of need for both agents and specialists can support the development of collegiality within the Extension organization. Supporting professionals in this stage of their career growth will position them well for advancing to additional career stages within Cooperative Extension.

Keywords: colleague career stage, Cooperative Extension competencies, agent professional development, specialist professional development

Brief Literature Review

According to Weatherly, a competency “is a collection of related knowledge, skills, abilities, and other personal characteristics ... working in concert to produce outstanding performance” (Cochran, 2009). Cochran further attributes competency to better job performance and workplace excellence. Significant resources are invested in helping new employees develop workplace competencies, representing financial loss to the organization when employees leave (Harder et al., 2017). Harder et al. (2017) used a formula developed by Johnson and Senges to estimate that the financial cost to Cooperative Extension (CE) of losing an agent with a \$47,499 annual salary was \$284,994. The loss is based on the salary, which increases as the salary increases. Significant resources are committed to developing early career employees. Harder et al. (2017) quantified the value of the UF/IFAS onboarding program in increasing the competency of agents by 36.9%, providing a \$17,527 value per agent, also based on a \$47,499 salary.

It has often been expressed that Extension trains these agents, and then they move on to greener pastures; however, we have not thoroughly explored why they leave. An exit survey conducted by Human Resources of Virginia Cooperative Extension (VCE) agents, including 40 agents or field faculty over a four-and-a-half-year period, found that the primary reason these faculty departed was that they “secured a better job” (Woods, 2021). The reason these individuals gave for looking for other jobs was dissatisfaction with opportunities for advancement (Woods, 2021), despite the financial investments. Participants in a study of early career VCE agents expressed concern when they lost members of their cohort (Vines et al., 2018).

The career stages approach developed by Rennekamp and Nall (1993, 1994) helps underscore the professional development dynamics and motivations and has been used as a basis for the development of professional development programs in multiple states (Benge et al., 2011; Kutilek et al., 2002). Benge et al. (2011) added the pre-entry stage, so the career stages include the Pre-entry Stage, Entry Stage, Colleague Stage, and Counselor/Advisor Stage (Benge et al., 2011; Rennekamp & Nall, 1994). The approach highlights the distinctions between different stages and Extension agents’ motivations to consider career growth (Benge et al., 2011; Kutilek et al., 2002; Rennekamp & Nall, 1993, 1994).

This approach defines abilities and professional development needs for Extension employees in different stages of the career. Stages that are defined include:

1. The Entry Stage is the Extension agent’s career commencement stage. In this stage, agents acquire essential skills to complete specific tasks, learn organizational standard procedures and policies, implement and propose innovative ideas, establish internal linkages, and move from dependence to independence (Benge et al., 2011; Kutilek et al., 2002; Rennekamp & Nall, 1993, 1994).
2. The Colleague Stage is where professionals gain identity in the profession, become independent, expand their innovation and initiative, identify an area of expertise, seek

- professional development opportunities and funding, and move from independence to interdependence (Benge et al., 2011; Kutilek et al., 2002; Rennekamp & Nall, 1994).
3. In the Counselor/Advisor Stage, the agents acquire leadership positions, take decision-making roles and problem-solving, gain positions of influence, and acquire broad-based expertise (Benge et al., 2011; Kutilek et al., 2002; Rennekamp & Nall, 1994).

Competencies associated with employment and professional development have been subject to much discussion and research because of their role in the retention of Cooperative Extension employees. Donaldson and Vaughn (2022) identified 97 total studies when searching for the keyword “Extension professional competencies” from the Summon Database at North Carolina State University with publication years. From these, they identified 37 studies that stated a research methodology; that occurred within the United States; did not focus on paraprofessionals, administrative assistants, and/or graduate students; or focus on competencies taught in Extension Education courses (Donaldson & Vaughn, 2022). Within these documents, Donaldson and Vaughan (2022) identified fifteen professional competencies associated with Extension professionals. They include communication, diversity and cultural competence, flexibility, interpersonal relations, knowledge of Extension, leadership, professionalism, program planning and evaluation, resource management, subject matter competence, teaching methodology and delivery, technology, thinking and problem-solving, understanding community needs, and volunteer management. A previous study by Harder et al. (2010) used a Delphi study with a national panel of Extension experts to determine competencies for entry-level Extension professionals. From these, they developed a model of entry-level Extension educator competencies. Implicit in their model is an indication that necessary competencies may vary over time, as their model is labeled to include competencies for 2015 (Harder et al., 2010). Additionally, Berven et al. (2020) also used a Delphi study to identify competencies needed for new agents in Tennessee to be successful in their work.

The competencies identified through national studies by Donaldson and Vaughan (2022) did not reference the career stage. These are summarized in Table 1, along with the entry-level competencies identified by Harder et al. (2010) and Berven et al. (2020). Harder et al. (2010) assigned competencies to broader categories to address specific areas within those competencies, which are reflected in this table. The broader categories reflected here from the Harder et al. (2010) model include applied research skills, core interpersonal skills, Extension program development process, technical/subject matter expertise, and volunteer development. Donaldson and Vaughn (2022) contributed Extension knowledge and the broad area of technology, which may encompass both professional processes as well as the use of technology in educational programming. The Harder et al. (2010) model referred to being “able to utilize technology for program delivery” (p. 49).

Table 1. Compilation of Categories of and Specific Competencies Focused on Early Career Extension Professionals and Connected to National Scoping Project for Extension Professionals Without Reference to Career Stage

Category	Specific Competencies Identified	Scope	Reference(s)
Applied Research Skills	Applied research skills	National	Harder et al. (2010)
Core Interpersonal Skills in general	Flexibility	National	Donaldson and Vaughn (2022)
	Professionalism	State and National	Berven et al. (2020), Donaldson and Vaughn (2022), and Harder et al. (2010)
	Self-management	National	Harder et al. (2010)
Core Interpersonal Skills related to communication	Communication	State and National	Berven et al. (2020), Donaldson and Vaughn (2022)
	Oral and written communication skills	National	Harder et al. (2010)
Core Interpersonal Skills related to diversity	Cultural sensitivity	National	Harder et al. (2010)
	Diversity and cultural competence	National	Donaldson and Vaughn (2022)
Core Interpersonal Skills related to interactions with others	Interpersonal relations	National	Donaldson and Vaughn (2022)
	Relationship building	National	Harder et al. (2010)
Core Interpersonal Skills related to leadership	Leadership	State and National	Berven et al. (2020), Donaldson and Vaughn (2022)
	Organizational leadership development	National	Harder et al. (2010)
	Personal leadership development	National	Harder et al. (2010)
Core Interpersonal Skills related to critical thinking	Problem-solving	National	Harder et al. (2010)
	Thinking and problem-solving	National	Donaldson and Vaughn (2022)
Develop Extramural Funding	Develop extramural funding	National	Harder et al. (2010)

Present Study

This study focuses on the experiences and needs of agents and specialists between four and seven years of service to identify needs at this stage in their careers. Objectives of the project

were to (a) identify career-related challenges experienced by VCE professionals four to seven years in their career; (b) identify opportunities for change in the work environment or professional development programming that increase support and retention for Extension professionals in this time; (c) identify unique and shared needs for Extension agents and specialists; and (d) increase visibility, membership, and activity for the Alpha Gamma Epsilon Sigma Phi (ESP) chapter within VCE. There were four areas of inquiry: competencies, sources of stress, the role of needs assessment in work, and mentoring and support. This portion of the study focused on competencies connected to objectives one through three. The five critical competencies for early career Extension faculty identified by Berven et al. (2020) were used as the basis for the focus group questions related to competencies. These are defined as communication, educational design, leadership, professionalism, and subject matter knowledge. Because these faculty are just beyond this career stage, they should be able to identify the best sources of support and needs associated with these competencies.

The juncture between the entry and colleague stage time in the career of VCE professionals is crucial as agents pursue promotion and tenure-track specialists go through the tenure process. Specialists were included in this study because there has not been a lot of work looking at the experience of specialists based on career stage. This project was supported in part by a national ESP professional development grant. ESP is an honorary Extension fraternity that generally requires a minimum number of years of service set by the state chapter for potential members. VCE faculty are eligible to join Epsilon Sigma Phi with three years of service. Membership extends beyond agents to include specialists and administrators as well.

This study consisted of a single case study with sources of data including (a) focus group findings from Extension professionals with four to seven years of experience, (b) reactions and responses to focus group sessions by the research team, and (c) prioritization of issues and recommended solutions developed through an online modified World Café session led by members of the research team with focus group participants. This article provides findings and recommendations from the project related to competencies.

Methods

This project was deemed “not human subjects research” by the Virginia Tech Institutional Board (IRB 20-904).

We assembled a research team in May 2020 to develop an assessment of employees to build on an earlier study of entry-level Extension agents. The research team was made up of the leadership of the Epsilon Sigma Phi chapter as well as members of the VCE administrative team. We decided to use online focus groups and to look at not only the perspectives of Extension agents but also Extension specialists. Six online focus groups were developed using purposive random sampling to fill a total of six focus groups. Four agent groups were provided with two groups each for promoted and non-promoted agents. The remaining two focus groups were split

between tenure track and non-tenure track specialists. The lower number of specialist groups is due to their reduced number within VCE. The sampling frame was obtained from the human resources department and cleaned to identify the promotion and tenure status of potential participants. Random numbers were applied to each group to identify the order in which individuals were invited to participate in the project. The goal was to have six to eight participants in each focus group. Invitations to participate were sent via email. The invitations included a link to a Doodle poll that recipients could use to identify their availability if they were willing to participate in the study. Groups were set, and focus group sessions were scheduled using the data collected through the Doodle polls.

We conducted the focus groups online using a needs assessment approach (publication in press). Two members of the research team presided over each focus group. One focused on facilitating the session, with the second assisting by entering questions in the chat, taking notes, and asking clarifying questions. The sessions were recorded and transcribed. One of the research team members took responsibility for cleaning up the transcripts. The cleaned transcripts were shared with focus group participants for member checking.

The five critical competencies identified by Berven et al. (2020) were used to open the conversation with the Extension professionals and provide examples of what was meant by competencies. Focus group participants reflected on these as they responded to questions asking them to identify areas in which they felt most competent and methods used to attain that competency as well as areas in which they were least competent and support needed to achieve greater competence in those areas. Participants provided recommendations on how VCE could support their growth in these areas. In addition, participants were asked to identify additional competencies they felt were important.

After the focus group sessions were complete, the research team met to reflect on the competency area of inquiry. Three questions guided the research team's reflection:

1. What did you hear that you were not expecting to hear?
2. As you reflect on the content of your group as a whole, what action items would you recommend for us or others in the organization?
3. Are there areas where you feel we need to follow up to learn more?

These sessions were also recorded, transcribed, and sent to the participants for member checking.

Findings guides were developed based on the focus groups and research team discussions. These were shared with the research team for revision and then submitted as VCE publications to make them accessible to the VCE community. The findings guide for competencies is available at https://www.pubs.ext.vt.edu/content/pubs_ext_vt_edu/en/ALCE/ALCE-287/ALCE-287.html.

Focus group participants were invited to participate in an online session using a modified World Café approach in order to prioritize issues that were identified earlier and to develop recommendations. The online session took place roughly one year after the original sessions. Breakout rooms were used for each of the content areas, including competencies. Participants indicated priorities for three content areas they hoped to discuss and were assigned to participate in breakout sessions for each area. Breakout room assignments and links to the findings documents were sent via email to participants the week before the session to allow them time to review the materials. The initial and first follow-up sessions for each area were 20 minutes in length, with the third being 15 minutes in length. A member of the research team facilitated the session in each area, while another individual outside the project was asked to assist in capturing responses in a Google document. All participants could access and edit the Google document. Participants were asked to finalize a response over the three sessions to three questions. They were: (a) “Is there anything you feel is missing or should be added to the findings document?”, (b) “As a group, list the items you see as top priority that need to be addressed in order to improve VCE,” and (c) “Work through the items identified in #2 to make recommendations in terms of further discussion or study, policy, practice, professional development topics, etc. to address each of these in order to strengthen VCE.” The Google documents containing the responses were kept open for one week following the session for participants to review and make modifications, as well as for individuals unable to participate to make comments and additions. No additional responses were received. This data was then analyzed for inclusion in these findings.

Findings

Demographics

Demographics of the participants in the focus groups are provided at https://www.pubs.ext.vt.edu/content/pubs_ext_vt_edu/en/ALCE/ALCE-279/ALCE-279.html. The research team consisted of VCE administrators, specialists, and agents. They represented VCE leadership, specialty in VCE continuing professional development, and the ESP leadership team. A team of graduate students and a college retiree comprised the notetakers for the modified World Café sessions. A total of twelve agents and one specialist participated in the feedback session related to competencies.

Findings Overview

Overall and when considered by their roles as agents or specialists, participants in the focus groups reported most frequently feeling least competent in educational design and most competent in subject matter knowledge (see Table 2). Communication was the second most frequently identified area of least competency. No specialists reported feeling least competent in subject matter or most competent in either leadership or professionalism. Other competencies that were identified by the focus group participants included: budget and fiscal management,

collaboration, communicating with elected officials, fundraising, grant writing, inclusion and equity, marketing, performance evaluation reporting, solving issues across disciplines, time management, and work-life balance.

Table 2. Number of Agent and Specialist Responses Related to Areas in Which They Feel Least and Most Competent

Competency	Agents – Least	Specialists – Least	Agents – Most	Specialists – Most
Educational Design	15	4	5	2
Communication	5	3	8	1
Subject Matter Knowledge	5	0	10	8
Leadership	2	1	4	0
Professionalism	1	2	1	0

Four competency areas were identified as top priorities and ranked in this order during the modified World Café feedback session: communication, educational design, leadership, and budget and fiscal management. A summary of the findings for each of these categories is included here. The feedback group reviewing the findings related to competencies shared that although educational design was identified as the area where agents and specialists were least competent during the focus groups, they felt that without good communication, it did not matter how well-designed, implemented, or impactful programs were. Therefore, they prioritized communication skills above educational design.

Communication

Some agents and specialists identified communication as the area in which they were least competent. Communication was expressed as an outgrowth of relationships both inside and outside VCE. Agents spoke about challenges in keeping up with changes in delivery methods as making communication difficult with external audiences. One agent said, “You know, our traditional way of reaching people with newsletters and things like that – we don’t do much anymore. So, having to change – that is a little hard.” Another agent spoke about challenges in shifting audiences and talking to different age groups from six to 80 years old. She said, “That’s been my struggle recently, is how to communicate with a very diverse group of ages and communication preferences in a way that has been effective.” Agents expressed interest in learning how to best communicate with elected officials at the local, state, and federal levels.

One specialist identified communication as the area where she had the least exposure and training. She said,

But I also just think there’s so many different levels of communication that you have to know how to communicate with stakeholders. You have to know how to communicate effectively with staff at different levels, you have to know how to do this with funders, so there’s just so many different types of communication that it can feel overwhelming. ... I

took courses on pedagogy in school as well, not a lot of them, but I don't think I took anything beyond public speaking, or whatever it is you take when you're a freshman. I do think it's harder to learn how to send effective emails and get responses or when it's not appropriate to email, and when you have to call and who doesn't want phone calls and who wants a text message. And who doesn't like a text message and wants you to call them? It's just, it's things you have to learn on the job, I think that it can be, it can be a little overwhelming.

An area of challenge associated with communication repeated by several agents was the ability to communicate for fundraising and grant writing. One agent said,

Being an Extension agent is a lot like running your own business as a sole proprietor and you are truly building the business – you're marketing it, you're funding it, and you're doing all those things, and it can be a real challenge and be overwhelming because the funding isn't always readily available for a lot of agents.

Another agent spoke of challenges associated with moving to virtual programming as a result of COVID and being able to reach some of the older clients. The agent said,

Just this push for technology and push for virtual meetings has been really hard on them [older clients]. I feel like I've kind of pivoted and targeted towards it very easily, but reaching them and having them have some kind of buy-in has been really hard. So, trying to get information out to that group has been really difficult.

One specialist made the point that they must also be conscious of the differences in presenting content in a refereed scientific journal versus talking to growers. Another specialist echoed the challenge of keeping up with communication technology, especially as they age. They said,

The challenge for me in the realm of communication is the ever-changing technology of communication. So, keeping up with that, and you know as you get older it gets harder to learn new things. I mean I don't want to be stereotypical but you get set in your ways. You've learned this and to have to learn something else, now that kind of thing, that's challenging, just keeping up with the pace of change, and particularly in this realm.

Agents credited office colleagues for helping them learn how to communicate more effectively using social media and or developing videos or virtual programming. Past experiences, in the classroom, in degree programs, and on the job were credited with increasing presentation skills in both agents and specialists. Leadership in-service, participating in the state agricultural leadership development program – Virginia Agriculture Leaders Obtaining Results (VALOR), and practice were identified as supports in tailoring delivery and messaging to improve interpersonal communication for agents. Specialists credited senior Extension specialists and agents giving them opportunities to practice presentation skills with different audiences,

increasing their confidence and providing feedback. Training provided during winter in-service was also noted as beneficial to the specialists.

During the feedback session, the groups agreed that their communication modes had shifted in the year since the focus groups occurred as a result of COVID-19. Feedback emphasized that being able to communicate the story is critical. In discussing communication, they included internal communication within VCE as well as external communication to current and potential stakeholders, collaborators, community members, and elected officials. They also talked about knowledge gaps for students and clientele. Agents expressed difficulty differentiating their instruction to support state standards of learning in the classroom. Agents working with adults have difficulty knowing which audiences prefer more or less detail. The feedback group emphasized a major purpose of communication was marketing.

Educational Design

Educational design was the area where both agents and specialists expressed they were least competent in the focus groups. It can be a very broad area encompassing program development and evaluation. It may also include curriculum development and is also connected to the competencies of communication and professionalism in terms of presentation skills and making sure that the program that is being delivered is appropriate to the audience.

Agents identified the following challenges:

- Not being comfortable with program implementation, as a result of not having enough training experiences due to the pandemic;
- Not getting experience in educational design because they were primarily adapting canned programs developed by others;
- Not understanding the theory underlying educational design and using backward design planning approaches;
- Developing educational programming that connects to a “broad audience across multiple discipline areas;”
- Having difficulty incorporating emerging technologies. One agent explained, “4-H is still very much tied to the traditional way of doing things and so any aberration from that is seen as a little bit strange, and, at times, not as valued;”
- Needing to connect youth curriculum with school standardized testing criteria for some youth agents in marketing programming to schools; and
- Creating evaluations and using appropriate evaluation methods.

Challenges identified by specialists included

- Not receiving training either in formal education or professional development in this area,

- Balancing time for educational design and a sense that being skilled in this area was not something valued in tenure reviews,
- Needing to change delivery methods to virtual environments as a result of COVID, and
- Needing access to presentation tools, such as clickers, that they could use to interact with their Extension audiences.

Agents would like to be able to take audiences beyond basic knowledge levels and go beyond where they feel they are basically just providing information. They would also like to increase their toolset so they can reach different types of learners in new audiences. One agent said, “Being one of the older mid-career folks, I think I really need to work on developing my use of technology with the programs I conduct.” Specialists also expressed interest in keeping abreast of changes in educational design.

Some agents received support in educational program design from prior work experiences as high school teachers or adult educators in GED and hospital programs. Many also learned from other agents, specialists, or administrators and by trial and error. One agent majored in educational design for her undergraduate degree. One of the specialists focused on educational design throughout her PhD program. One of the agents has a group of “teacher friends” that provide support in this area. VCE in-service training and self-study were also identified as sources of educational design support.

During the feedback session, participants said that the training in educational design that is currently provided is inadequate. They recommended that training in this area be more detailed, practical, and delivered over a period of time. They recommend a mix of in-person and online options. They also suggested that small cohorts might be developed to participate in the training and that there need to be regular follow-ups to keep up with changing trends. The group also recommended that there needs to be a statewide initiative to develop programs around top priority issues in the state each year. Finally, the group suggested that something needs to be done to support and encourage Extension specialists to set time aside to improve their educational design competencies as a priority in their program.

Leadership

One member of the research team remarked, “There wasn’t a specialist that felt competent in leadership.” One agent who felt least competent in leadership felt there were barriers that prevented their growth in this area. They said,

And I really feel like working in Extension and seeing the way things are done that there’s nowhere to go once you come in as an agent. You can get to a senior agent. And that’s it. I feel like any levels above that – there are gatekeepers and they don’t give you enough information to get to that next level.

Another agent expressed frustration in obtaining a leadership position. The agent said,

And unless you are part of the insider trading team, you don't even really have a voice to talk that way about what's coming. And if you bring it up, they slam you with a process that is never really, truly made clear, which kind of stalls out your ability to lead in any one direction. And that's very frustrating.

I have a leadership position with an organization within Extension, but what I have learned is when I apply skills and knowledge from other areas outside of Extension for leadership here, I realized that that's not the way they want you to function. They just want you to be either a puppet or a 'yes man' and not to ruffle the feathers of the people who pull the strings. And that's it, and it's almost like a ceremonial thing and not an actual thing, and that part is very frustrating.

Being in a position to lead, having the knowledge to lead, but those missing pieces that are part of Extension, I feel like they only give you enough to train somebody else but not enough to be really effective. And that's unfortunate because it's hard to lead when you don't have all of the knowledge and understanding and it's almost like they hoard that and give you just enough to get you to where they want you to be, but not as far as you could be and that handicaps you for being as effective as a leader as you can be. And so, it's really frustrating to have to go around to so many different people to learn to find out the bits and pieces that you really need to know in order to be as successful as you could be.

A specialist expressed that they would like to develop leadership skills to bring outside organizations together better when "there are a lot of personalities and emotions that run high" to share resources and better meet community needs.

Agents spoke of developing this competency through different types of training. The Faculty Leadership Development Program provided by VCE was identified, as well as county programs and work with specialists. Experience in leadership roles also contributed, as did work in professional associations.

Sources of support contributing to future growth in this competency are coworkers from multiple disciplines in shadowing experiences, virtual and in-person training, and pursuing advancing responsibility through administrative roles in the VCE organization. Professional associations were seen as a way to develop leadership and see what is being done outside Virginia. One agent highlighted the need to diversify representation in leadership positions within VCE to help other diverse individuals recognize their ability to move into higher roles. One agent spoke about opportunities for individuals in leadership roles to delegate in order to help others develop. The agent said,

People who are in a leadership position get that opportunity, but I feel like there's limited opportunities and I often see the same people in the same roles across lots of different things. ... I feel like I have the ability to be a leader, even though I'm only in year three, ... like every office only has one UC [Unit Coordinator]. Does the UC have to do all the roles of the UC, or can that be delegated so that there are opportunities for other people to step up? Because I would be willing to. I've just never been asked and I don't know what opportunities there are.

Another agent spoke about there being a need for clarification of roles. The agent observed,

a lot of confusion about the jobs and the roles of some of these leadership positions within the state and even within the district. There's so much crossover. It's like, which middle manager do I go to for this event?

Budget and Fiscal Management

Budget and fiscal management was one of the “other” competencies that was identified by both agents and specialists in the focus groups. The feedback group selected this as their fourth priority, stating that “some agents have no background in this.” One agent expressed interest in understanding the budget and where it stood since their unit was currently without a unit coordinator who would normally manage that. They also expressed interest in understanding how to budget for mini-grants that are available to localities. The specialist expressed interest in knowing how also to manage grant processes as well as how to navigate “internal administrative processes.” They expressed particular need to understand this because the specialist is housed off-campus and does not have administrative support at their location.

Discussion

Competencies emerging from the VCE early career Extension professional focus groups repeated communication, educational design, leadership, professionalism, and subject matter knowledge as defined by Berven et al. (2020). These results are not surprising since these competencies were included in the question prompt. However, competencies associated with budget and fiscal management, collaboration fundraising, grant writing, performance evaluation reporting, solving issues across disciplines, time management, and work-life balance emerged in the focus group discussions. Similarly, Benge et al. (2011) identified “cultural sensitivity, developing extramural funding, applied research skills, and leadership development” as emerging competencies (p. 6). Many of these emergent competencies can be directly connected to the competencies identified by Donaldson and Vaughn (2022) and Harder et al. (2011), as demonstrated in Table 3. However, collaboration, communication with elected officials, inclusion and equity, and marketing appear to be unique competencies identified by this study which we classified as core interpersonal skills (Harder et al., 2011). The top three competencies, communication, educational design, and leadership, ranked during the World Café session were identified by

Berven et al. (2020). However, the fourth-ranked competency, budget and fiscal management, is emergent. Budget and fiscal management will likely fit within resource management defined by Donaldson and Vaughn (2022). This area may relate to Harder et al.'s (2011) and Benge et al.'s (2011) development of extramural funding, which appears to be more about understanding specific university accounting and reporting practices for existing funding.

Table 3. Relationship Between Competencies Emerging from this Study and Earlier Studies of Early Career Studies (Berven et al., 2020; Harder et al., 2011) and The National Scoping Document (Donaldson & Vaughn, 2022)

Category (Harder et al., 2011)	Emergent Competency Label from VCE Focus Groups	Berven et al. (2020) label	Harder et al. (2011) label	Donaldson and Vaughn (2022) label
Develop Extramural Funding	Budget and fiscal management, fundraising, and grant writing	Not defined	Develop extramural funding	Resource management
Core Interpersonal Skills	Collaboration	Not defined	Not defined	Not defined
	Communication with elected officials	Not defined	Not defined	Not defined
	Inclusion and equity	Not defined	Not defined	Not defined
	Solving issues across disciplines	Not defined	Problem solving	Thinking and problem solving
	Time management and work-life balance	Not defined	Self-management	Not defined
Extension's Program Development Process	Marketing	Not defined	Not defined	Not defined
	Performance evaluation reporting	Not defined	Program evaluation, program implementation, and planning	Not defined

These findings suggest that competencies may vary by individual Extension organizations, a position confirmed by Cochran (2009), who listed “understand the organization, understand and respect diversity, achieve excellence in teaching, conduct program evaluation, maintain accurate records and reports, maintain effective internal and external partnerships, communicate program value, ensure productive interpersonal relationships, demonstrate technology literacy, and demonstrate personal accountability” as core competencies (p. 64). Even though some differences may be attributed to organizational terminology, there is significant overlap from one

CE to another. Another possibility is that competency needs emerge as the organization changes over time.

Despite the VCE core competencies and emerging competencies highlighted, based on previous research, Arnold and Place (2010) outline possible negative outcomes that cause job dissatisfaction in the Colleague Stage. These influences include stressful environments caused by overloads, salary disparity, inconsistent performance evaluation, limited space for promotion, and frustrating reporting systems.

Recommendations

Communication

The findings emphasize the need for professional development training in the area of communication. The communication areas identified by the agents where they need support were grant writing, marketing, and virtual programming. Others suggested any kind of hands-on training where people could implement what they are learning and learn from each other. One specialist explained how she has her graduate students and technicians evaluate her presentation skills using her “um factor.” Support through communications experts that can be on hand to answer questions and through the winter in-service conference was seen as beneficial.

Educational programming to improve communication competency should focus on different strategies used to interact with specific audiences. A need to be able to communicate more effectively with elected officials was emphasized as being very critical. However, communication with other specific audiences, as identified in the findings document, is important as well. These included people of all ages, with different levels of education and needs around specific topics, and people with different communication preferences. Using technology to expand communication was also emphasized as an area of need. A participant stressed the importance of web-based programming as being “critical” for Extension success. Concern was expressed that the current VCE website was not useful and was lacking important information. Agents have to share documents directly with clients and, in some cases, have to reference other states to find the information they need.

Many of the recommendations related to the communications competency actually focused on organizational marketing to external audiences. A feedback participant said, “VCE has incredible programs which are broad and no one outside knows what these are about. We need to communicate more effectively.”

The feedback group discussed a need for increased human capacity to address communication needs for VCE. A comment indicates the need for a “standout communication department.” One agent suggested possibly having a marketing or grant-writing expert in each Extension district.

Participants in the feedback session recommended having communication and marketing specialists situated at the college or district level to provide support and assist with marketing.

Educational Design

Agents felt there were many opportunities they might use to improve their educational design competencies. Several expressed interest in basic training. One agent said, “I think anything that they can do that would kind of start from the beginning, and then we all grow from there would be great.” Others suggested more in-service offerings. One agent suggested “a longer more focused educational series on strengthening educational design, so perhaps like a four-week course or even longer than that maybe where we’re almost thinking, like the College level course in developing educational design.” Agents expressed a need for training that was more practical in nature and began at a more basic level to help with evaluation. Another agent suggested more programming similar to the well water clinics, which they described as being well-established and defined. Professional development associations, networking, and shadowing other agents were also identified as opportunities for growth. Another agent suggested special programming for new agents might be useful, especially related to Virginia Standards of Learning identified by the Virginia Department of Education. Refresher courses on educational design were also recommended. Agents also expressed interest in written materials they might read on their own during their work time.

A specialist suggested the materials related to educational design, or setting up Canvas sites, be placed online so they can be accessed on the road and in the field. They also expressed interest in in-service training and short courses. Another specialist shared,

I think, on the front-end orientations of new folks to the system could actually make it pretty clear about what is the role of educational design, what is the role of pedagogy in Cooperative Extension? I mean you are Extension educators, but there’s never like what that actually means. And particularly for folks that may have an interface - like before I interfaced with Extension, you know I did not think of Extension as an education source. It serves as a resource, so technical assistance. I never thought of Extension as education. Just because my own background and thinking about the education piece as the more formalized and so the whole non-formal-informal thing is something that I think VCE could do to help increase awareness. And then specifically offer noncredit workshops and things like that. Extension education is designed to help people who don’t have that exposure formally into, maybe how to incorporate reflections and practice-based learning too as a way to help people learn how to speed up there, because you know we’ve all been doing this in some way in our careers. But I think being able to have a formal process for capturing and understanding what we know how to do. It is taking some of those innate educational design experiences that we’ve had, and it’s a real learning.

The research team emphasized the different levels at which educational programming must be delivered to meet the wide range of audiences that Cooperative Extension serves. They commented that focus group participants were surprised at the amount of time that had to be invested in providing a successful educational program, going from identifying community needs through program evaluation. One research team member commented that after being around for a while, they had forgotten what it was like to learn to plan programs. Several commented on the changes in technology that they use in educational programming. Yet another member of the team spoke about how their teaching had changed from a more teacher- to a more student-centered approach over the course of their career.

Based on the discussion with the agents and specialists, the research team agreed that basic educational design training needs to be provided earlier in an agent's tenure. Additional training can then build on the basic training. There was a lot of discussion about how to provide a practical application component to the training, whether it be through a cohort of students, colleagues, mentors, or partnering agents or specialists. Members of the team found interactions across program areas and Extension regions were beneficial for them in learning to try new approaches and reach new audiences. There was also interest in providing modular content that trainees might access for follow-up after the course. The research team also suggested that all training should be widely publicized so that faculty might participate in it to receive a refresher.

The feedback discussion focused on the development of criteria to improve the adequacy of the training that is provided. They suggested a more detailed, practical approach that would be carried out over time with a cohort. They suggested this training be carried out using a virtual format but with at least an in-person kick-off. The program should have clear schedules set in advance so it will not lose momentum over time. Participants help hold each other accountable and learn from each other as they share their work and lessons learned. Other suggestions from the feedback group included having a statewide initiative to design standard programs based on real community issues. The feedback group also expressed a need to encourage extension agents to prioritize setting time aside to focus on educational design.

Leadership

The career stages approach to professional growth and the development of competencies explains a normal progression as Extension professionals go from pre-entry and early career to advisory roles (Benge et al., 2011; Rennekamp & Nall, 1994). This has implications for leadership development as well. VCE is currently focusing a lot of time on the development of the onboarding program for early career professionals. One recommendation from this proposal is that VCE hire someone to oversee onboarding and mentoring. Once the new onboarding program is implanted, VCE should spend time defining expectations from and support provided for individuals as they move through the different stages. There are numerous in-depth leadership development programs provided beyond the one identified in the focus groups. In-

depth leadership development training may be something that is provided for faculty as they move into the colleague or mentor stage. There may be places where Extension professionals can practice leadership as the mentor to others entering VCE or in serving in an advisory capacity for a regional or state-level program in addition to being the sole leader based on their job description or other position. Developing a wide array of leadership roles and identifying criteria and expectations for people taking those roles may make people more aware of existing roles and expose other areas where this leadership is needed. These roles may be in professional organizations, the communities, or within VCE. This will strengthen the organization by increasing employee buy-in and help develop leadership skills necessary in succession planning for VCE.

Budget and Fiscal Management

Budget and fiscal management is an area that has been identified as a need for VCE new faculty onboarding. Basics could be provided for agents and specialists in specific breakout sessions so that content could be provided according to their role. The grant managers in the college should work with educational specialists to develop appropriate modules that faculty could use to increase their knowledge as they take on new roles, begin to work with different types of grants, or have other experiences where this might be necessary. A repository of materials will allow faculty to review materials or have access to them as needed.

Conclusions

While there are many competencies that are important to VCE employees, communication, educational design, leadership development, and budget and fiscal management were prioritized most highly in this study of employees in the colleague career state at four to seven years of service. This stage roughly corresponds to the time at which Extension professionals should be in the colleague stage of professional development. Recommendations are provided to help support the development of these competencies for both agents and specialists. Routine evaluation should be used to identify progress in meeting the needs of VCE employees related to these competencies. This study suggests that competency needs should be revisited on a regular basis to identify and address new areas as faculty increase competency in these areas and identify emerging opportunities for professional growth. Additionally, despite the calls to retain Extension professionals, there must be efforts from the VCE to hire competent professionals as a means to transform the CE.

Study limitations include (a) we based our analysis on information provided by agents and specialists only without diversifying for other perspectives, (b) study findings are limited to VCE hence no claims for generalizability, and (c) it might have been helpful to gain deeper insights on extension professionals' job dissatisfactions which might influence competency and performance. Further study should look at ongoing changes in competency needs over time, by career stage, and within individual organizations. In addition, differences in competency needs

by agents and specialists should be considered when developing appropriate content for professional development programs.

References

- Arnold, S., & Place, N. (2010). Career influences of agricultural Extension agents. *Journal of Agricultural Education*, 51(1), 11–21. <https://doi.org/10.5032/jae.2010.01011>
- Benge, M., Harder, A., & Carter, H. (2011). Necessary pre-entry competencies as perceived by Florida Extension agents. *Journal of Extension*, 49(5), Article 3. <https://tigerprints.clemson.edu/joe/vol49/iss5/3/>
- Berven, B. C., Franck, K. L., & Hastings, S. W. (2020). Investing in Extension's workforce: Assessing and developing critical competencies of new agents. *Journal of Extension*, 58(2), Article 28. <https://tigerprints.clemson.edu/joe/vol58/iss2/28/>
- Cochran, G. (2009). Ohio State University Extension competency study: Developing a competency model for a 21st century Extension organization. [Doctoral dissertation, Ohio State University]. http://rave.ohiolink.edu/etdc/view?acc_num=osu1243620503
- Donaldson, J. L., & Vaughan, R. (2022). A scoping study of United States Extension professional competencies. *Journal of Human Sciences and Extension*, 10(1), Article 8. <https://doi.org/10.54718/BNRG8317>
- Harder, A., Hodges, A., & Zelaya, P. (2017). What is professional development worth? Calculating the value of onboarding programs in Extension. *Journal of Extension*, 55(1). https://archives.joe.org/joe/2017february/pdf/JOE_v55_1tt3.pdf
- Harder, A., Place, N. T., & Scheer, S. D. (2010). Towards a competency-based Extension education curriculum: A Delphi study. *Journal of Agricultural Education*, 51(3), 44–52. <https://doi.org/10.5032/jae.2010.03044>
- Kutilek, L. M., Gunderson, G. J., & Conklin, N. L. (2002). A systems approach: Maximizing individual career potential and organizational success. *Journal of Extension*, 40(2), Article 3. <https://tigerprints.clemson.edu/joe/vol40/iss2/3/>
- Rennekamp, R., & Nall, M. (1993). *Professional growth: A guide for professional development* (Publication IP-34). University of Kentucky Cooperative Extension Service.
- Rennekamp, R., & Nall, M. (1994). Growing through the stages: A new look at professional growth. *Journal of Extension*, 32(1). <https://archives.joe.org/joe/1994june/a2.php>
- Vines, K. A., Cletzer, D. A., Westfall-Rudd, D., Lambur, M., Hunnings, J., & Vines, N. T. (2018). Identifying needs and implementing organizational change to improve retention of early-career agents. *Journal of Extension*, 56(1), Article 23. <https://tigerprints.clemson.edu/joe/vol56/iss1/23/>
- Woods, A. (2021, October 20). Extension exit survey report. [Internal Report]. *VCE Onboarding Committee Meeting*. Virtual.

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Acknowledgments

We wish to acknowledge the agents and specialists that participated in this study as well as National Epsilon Sigma Phi for providing funding to support this work through a Professional Development grant.

Mississippi Career and Technical Education Teachers' Perception Toward Implementing a Food Science Toolkit Designed to Increase Food Science Curriculum Use in Mississippi

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A pilot test implementing a food science toolkit designed to increase student awareness, interest, and knowledge of food science academic and career pathways in Mississippi Career and Technical Education (CTE) courses was conducted to determine teachers' perceptions of the food science education resources. After implementing the food science toolkit in their CTE course, four teachers individually participated in a semi-structured interview to capture each teacher's detailed experience implementing the food science toolkit. The results of this study revealed that teachers are interested in teaching food science at the secondary education level to increase student knowledge of food science and enhance student performance at the FFA food science career development event. Teachers also revealed their positive experience implementing the food science toolkit and their intentions to continue to use the food science toolkit in their CTE courses to further increase their exposure to food science competencies. Teachers perceived that the food science toolkit increased student exposure to, engagement in, and interest in food science academic and career pathways, which encourages students to select and pursue a career in food science.

Keywords: teaching toolkit, secondary education, curriculum implementation, career pathways

Introduction

Mississippi is primarily an agricultural state that sends most agricultural commodities to food companies in other states for added-value processing, which has led to Mississippi's lack of

focus on developing “new economic activity” through state-based raw commodities (Meter & Goldenberg, 2014). With the decline of agriculture-related businesses and an increased interest in exporting agricultural commodities, many youths lack basic skills and knowledge about farming and agriculture-based concepts. Specifically, youth lack an understanding of food science concepts and basic acknowledgment of commonly consumed foods. Education in food science at the secondary education level will help train students for jobs in the food industry as well as produce a trained workforce so that food companies have greater opportunities and incentives to open added-value food plants in Mississippi.

Students are generally exposed to food concepts in agriculture-based career technical education (CTE) courses that are taught in Mississippi public school districts; however, there is limited time allotted for teaching food science concepts in CTE courses as well as few professional development opportunities to enhance teachers’ ability to teach food science-based instruction effectively. In addition, Food Science is not taught in schools in Mississippi; however, there are career development events hosted for students in Mississippi (FFA) to showcase skillsets learned in various technical learning fields, including food science. Teachers in Mississippi schools lack the training to teach food science in the classroom and to train students for FFA contests.

Several studies describe the development, dissemination, and implementation of food-related interventions to promote food science-related concepts at the secondary education level (Bell, 2014; Jideani & Jideani, 2010; Kahnke et al., 2006; McEntire & Rollins, 2007; Shearer et al., 2014). These findings indicate that providing teacher training and educational resources enhanced the implementation process of the food-science-related resources as well as increased interest in the food science career pathway among high school students and teachers. However, few qualitative studies exist related to teachers’ perceptions of implementing food science educational resources in CTE courses. More specifically, there were no formal professional development opportunities available for Mississippi CTE teachers to enhance their knowledge and teaching strategies to support the high-quality implementation of food science-related concepts in their classes.

Our research group trained teachers to implement food science lessons and observed an increase in Mississippi CTE teachers’ self-perceived knowledge, skills, and self-efficacy to teach food science (Hendrix et al., 2021). Han and Weiss (2005) investigated similar factors that impacted teachers’ perceptions towards implementing various school programs, and they determined that evaluating and understanding teachers’ perceptions is highly important and impactful towards the implementation and continued use of school program resources. Therefore, there is a need to provide teachers with educational materials, expert support, and training to deliver food science material to students confidently.

The purpose of this qualitative research study was to understand and describe Mississippi CTE teachers' experiences when implementing food science educational resources. The following research questions were answered in this study:

1. Why are Mississippi CTE teachers interested in teaching food science in secondary career and technical education courses?
2. How do Mississippi CTE teachers characterize their experiences implementing food science educational resources in their secondary career and technical education courses?
3. What were the perceptions of the CTE teachers towards the quality of the food science educational resources and implementation process?
4. Why would CTE teachers continue to use food science educational resources?

Materials and Methods

The Development of the Food Science Teaching Toolkit

Members of the Mississippi curriculum development team identified a growing interest and participation of middle and high school CTE students and teachers in the Mississippi FFA Food Science Career Development Event. A collaborative team consisting of Research and Curriculum Unit (RCU) members, Mississippi Food Science faculty, and Mississippi CTE teachers developed a secondary education food science curriculum framework that consists of competencies in food microbiology, food sanitation and safety, food processing, food chemistry, and professionalism in the field. To further promote food science career pathways in Mississippi secondary education CTE courses, a food science teaching toolkit was created to support the development of the food science curriculum framework and offer Mississippi CTE teachers educational resources to implement food science lessons in their CTE courses.

The food science teaching toolkit was developed using lessons created by the research team and adapted versions of existing food science secondary education resources provided by the Institute of Food Technologists (Institute of Food Technologists, n.d.). The food science teaching toolkit includes six introductory lessons featuring experiential learning opportunities to increase CTE students' awareness, interest, and knowledge of food science concepts. Each lesson was structured as a 1-hour lesson that included a warm-up activity to introduce the specific food science topic, a knowledge-based lecture and/or discussion, and an experiential learning activity to practice food science skills (see Table 1). A panel of Mississippi CTE teachers with experience teaching Family and Consumer Sciences and Agriculture and Natural Resources courses, CTE administrators, and agriculture and Extension education faculty reviewed lesson objectives and ease of implementation in CTE courses and provided suggestions for improvement.

The Food Science Toolkit

Within the food science teaching toolkit, teachers were provided a loose-leaf notebook containing (1) lesson plans consisting of a lesson summary, objectives, overview of lesson activities, and lists of supplies needed for the lessons; (2) lesson notes and teaching scripts; (3) student activity worksheets and instructional handouts; (4) PowerPoint presentations; and (5) consent forms and evaluation tools. Teachers were also provided access to an electronic file containing all documents included in the loose-leaf notebook. The food science teaching toolkit also included various non-perishable supplies (i.e., biuret solutions and food fragrances) needed for conducting the learning activities. The specific food science lessons included (1) an introduction to food science, (2) food product development, (3) food chemistry, (4) food safety, (5) food processing, and (6) sensory evaluation. The related experiential learning activities allowed students to explore various food science disciplines and careers, food product development steps for producing ice cream, fermentation, protein identification in food samples, candy chemistry and production, identification and correction of hazards in food processing facilities, and food sample and aroma identification. All toolkit supplies were disseminated to CTE teachers after acquiring their consent to participate in the research study and acquired approval from the district and school officials.

Implementation Procedures and Participants

A food science professional development training featuring an introduction to and teaching strategies on implementing the food science toolkit resources was conducted for Mississippi CTE teachers (Hendrix et al., 2021). At the end of the food science professional development training, teachers were invited to participate in a pilot study to assess the implementation of the food science teaching toolkit resources. Teachers who committed to participate in the study:

- Implemented the food science educational resources during the 2019-2020 school year,
- Assisted the research team in acquiring parent permission and student consent before implementing the food science teaching toolkit in their CTE courses,
- Administered a student assessment before and after implementing the six food science lessons and activities in their classes, and
- Participated in a post-implementation interview to capture their experience implementing the food science teaching toolkit.

High school CTE teachers (N = 4) participated in this pilot study, and those teachers reached approximately 70 students. Participating teachers were from public school districts located in rural communities of Mississippi. Teaching experience among the teachers ranged from 6 to 21 years of teaching 8th–12th-grade agriculture and natural resources, agricultural sciences, and/or agriculture-related courses.

Measurements

After the implementation period, post-implementation interviews were conducted to capture each teacher's detailed experience implementing food science lessons and activities in their CTE classroom. A semi-structured interview protocol was developed and used to maintain consistency and limit opportunities for bias during the interview process. The interview protocol highlighted the following topics:

- Teacher interest in teaching food science in Mississippi career and technical education courses,
- Teacher perceptions towards implementing the food science lessons and activities in CTE courses,
- The perceived quality of the food science lessons and activities, and
- Continued use of food science lessons and activities in CTE courses.

The interview protocol was piloted and reviewed to clarify interview questions and terminology and to approximate the time to conduct interviews. Interviews were hosted via an online meeting platform and were all audio-recorded and transcribed for analysis. Pseudonyms were assigned to the names of participating teachers when data was transcribed. Each interview lasted 45 minutes to 60 minutes. The guiding interview questions were aligned with the objectives of this research study. Approval to conduct this study was provided by Mississippi's Institutional Review Board (protocol # 18-396), and all IRB procedures were followed accordingly.

Statistical Analysis

Data were analyzed using a qualitative research approach (Creswell, 2009) that followed a conventional content analysis. Within the scope of a conventional content analysis, the knowledge gained and codes identified are generated directly from the data allowing new perceptions and understanding to result from the data without the influence of preconceived theories (Kondracki & Wellman, 2002; Hsieh & Shannon, 2005). All raw data were collected, organized, and read multiple times by two researchers. Initially, data were coded by two researchers independently via an open-coding approach. When interpreting the data, codes were examined and charted via recurring patterns and characteristics identified among the data. Recurrent themes among the data were identified, and direct quotes from participating teachers were also charted per category to support data analysis. Data analysis was repeated and validated by a member not involved in the interview process. This member was trained in content analysis (by the research team). This member (1) independently categorized the qualitative data for each research question, (2) compared and validated the researcher's analysis to arrive at a consensus, and (3) selected appropriate quotes for each theme and category of the data set.

Table 1. Food Science Toolkit Lesson Objectives and Sample Food Science Lesson Activities and Toolkit Supplies

Lesson Title	Lesson Objectives	Sample Lesson Activities and Description	Food Science Toolkit Supplies
Discover Food Science	<ol style="list-style-type: none"> 1. Define food science 2. Explain the farm-to-fork concept 3. Describe the branches of food science 	I'm Eating What? ¹ - Students identify how raw materials are converted to final food products	<i>I'm Eating What?</i> Student Flashcards and Teacher Discussion Guide ¹
Food Product Development	<ol style="list-style-type: none"> 1. Describe the steps involved in product development 2. Apply the steps of food product development in the process of making ice cream 3. Demonstrate leadership, teamwork, and creative thinking skills 	Food Scientist for a Day ² – Students create an ice cream product following the steps of product development	<i>Food Scientist for a Day</i> Student Handout
Food Chemistry	<ol style="list-style-type: none"> 1. Define the term food chemistry 2. Identify and describe the six main components found in food 3. Define supersaturation and explain what that means in terms of candy production 	Candy Chemistry ³ – Students learn to make hard rock candy	Candy molds Candy flavoring Candy thermometer
Food Safety	<ol style="list-style-type: none"> 1. Discuss the personal hygiene requirements of food handlers 2. List the seven steps of HACCP (Hazards Analysis Critical Control Point) as a method to prevent foodborne illness 3. Identify the types of food hazards and describe corresponding corrective action 	<p>Glo Germ Handwashing Demonstration⁴ – Students learn proper handwashing procedures</p> <p>Sanitation Scenarios – Students identify all hazards and corresponding corrective action</p>	<p>Glo Germ™ Handwashing toolkit - Glo Germ solution and UV light</p> <p>Sanitation scenario cards</p>
Food Processing	<ol style="list-style-type: none"> 1. Define the term food processing and associated terms 2. Describe why foods are processed 	Fermentation Balloons ⁵ - Students learn how gasses are produced when yeast, sugar, and water are mixed	Fermentation balloon demonstration kit (3 - 12 oz plastic bottles and balloons)

Lesson Title	Lesson Objectives	Sample Lesson Activities and Description	Food Science Toolkit Supplies
	3. Identify the various food processing methods and explain procedures used to process food safely: Drying, dehydration, freezing, canning, etc. 4. Describe how food safety is monitored and regulated during processing	Food Tasting - Students taste and analyze food products that are processed differently	
Sensory Evaluation	1. Define sensory evaluation 2. Define the term triangle test and explain its use 3. Practice how to conduct a triangle test Describe the steps of evaluating and identifying aromas	Aroma Identification ⁶ – Students learn how to identify various aroma samples One of These Things is Not Like the Other - Triangle Test ⁷ - Students learn how to conduct a triangle test and identify an odd sample using sensory evaluation techniques	Aroma sample kit (30 aroma samples) Triangle test and aroma identification student handouts

Note. These lessons and activities were adapted by using the following resources: Rowley & Peacock (n.d.a)¹; Gardner (n.d.)²; Crist et al. (2021)³; Glo Germ (n.d.)⁴; Exploratorium (n.d.)⁵; Bohlscheid (n.d.)⁶; Rowley & Peacock (n.d.b)⁷

Results

Research findings were organized and presented by research questions. Four main categories were highlighted: (1) teacher interest in teaching food science, (2) teacher experience implementing food science education resources, (3) teacher perception of food science education resources, and (4) teacher's reasons for continued use of the food science education resources. Per category, prominent themes among participating teachers' responses were noted corresponding to each research question.

Research Question One: Why are Mississippi career and technical education teachers interested in teaching food science in secondary CTE career and technical education courses?

Teachers stated a range of reasons for their interest in teaching food science in their CTE courses. Two themes emerged from the data analysis: (1) to increase understanding of food science among students and (2) to enhance student training and performance for/at the FFA food science career development event (CDE).

Theme 1: Increase Knowledge of Food Science Among Students

Teachers' interest in teaching food science is motivated by their desire to increase their students' knowledge of food science principles. For example, Emma, a teacher with eight years of experience teaching high school agriculture courses, stated that students showcased a true interest in food science, but they did not understand concepts such as "how food is processed," "how food is brought to the table," and "how [food] is packaged." Additionally, one teacher, Sarah, thoroughly described how students she had previously exposed to food science concepts were confused about various food science principles. Sarah also expressed how she believed the students would benefit from correctly understanding food science principles. Sarah stated,

Firstly, anything related to food is going to get kids' attention automatically. ... I think from a personal standpoint, packaging really confuses kids and not just kids, even [teachers] for as what is healthy and what is not, or what does the terminology on the packaging mean? And I think they will be more educated consumers if they understand the words and the packaging and the labeling. And I think that's something that every one of them ... [will] benefit from it.

It was expected that all participating teachers discussed that their interest to teach food science is driven by increasing knowledge of food science among their students.

Theme 2: Enhancement of Student Training and Performance for/on the FFA Food Science CDE

A commonality for their interest in teaching food science among participating teachers was their desire to enhance student performance at the FFA food science career development event. All participating teachers train student FFA teams to compete annually in the state level FFA food science CDE. Some teachers expressed how their team competed and placed at the state-level food science CDE and participated at the national level. However, teachers desired to enhance training methods and student performance on the FFA food science CDE. This response coincides with the previous emerging theme of increasing student knowledge of food science concepts. Teachers observed increased interest in food science among students who participated in the FFA food science CDE; therefore, they began to pursue opportunities to increase their knowledge of food science further and acquire resources to teach food science concepts in their CTE courses. Christine specifically expressed,

I got started doing food science when I had a group of students that were interested in the food science competition when we first started with FFA ... and so the [students and I] both, we kind of dove in together and we started learning about all of it and it was really interesting [and] fascinating.

Sarah extended this idea beyond food science as the subject of focus when she expressed how food is a vehicle to teach various subject areas. Hence, she was interested in teaching food science among her students, and the increased desire of her students to compete instilled and motivated her to teach food science in her classroom curriculum.

Research Question Two: How do Mississippi CTE teachers characterize their experiences implementing food science educational resources in their secondary career and technical education courses?

Four prominent themes emerged among teachers' responses towards their experiences implementing food science educational resources: (1) teacher passion yields increased promotion, (2) teacher interest in specific lessons, (3) the implementation process was eased by the food science toolkit, and (4) student engagement.

Theme 1: Teacher Passion Yields Increased Promotion

Teachers' personal motivation to teach food science increased promotion of the food science educational resources among CTE students. Several teachers heavily promoted the food science lessons as fun and exciting before implementing resources of the food science toolkit. Mary stated,

[Food science is] something that I love, and kids can always pick up on that. Literally because I love it so much, I promoted it. ... We're just about to have some fun, and they loved it. ... They were super excited about it. ... I had gotten them pumped up, excited about it.

In addition to generating excitement and interest among the CTE students, Emma, who also promoted the food science lessons prior to implementing the food science toolkit, expressed that her students desired to participate in activities that are similar to the implemented food science activities on a daily basis.

Theme 2: Teacher Interest in Specific Lessons

All participants explained their interests and perspective toward specific food science lessons within the food science toolkit. Specifically, three teachers expressed that the food product development lesson was appealing to students, which resulted in heightened participation and engagement among students. It was also explained that the design of the food product development lesson created opportunities for teachers to extend the lesson for further exploration of various food science disciplines via intriguing questions presented by students. Sarah stated,

The [food product development lesson] was good. Um, most of them had done that at some point in their school year, but I will tell you ... after we did your lesson, they were very engaged. ... So that lesson, we ended up just really growing and stretching and doing a lot of stuff with ... they kept asking questions ... [the lesson] just had a good flow from their conversation, from the ice cream into ... labeling, which then kind of went into marketing and packaging ... [and] we gained a lot from that.

Teachers' interest in specific lessons, such as the food product development lesson, was also noted by increased creativity among students as they completed specific food science activities. The teachers' feedback confirms the intended design of the food science toolkit.

Theme 3: Implementation Process Eased by Food Science Toolkit

The participating CTE teachers characterized their experiences implementing food science educational resources by their ability to implement the lessons via the food science toolkit easily. All teachers expressed that it was convenient to teach the food science lessons based on the provided lesson plans, activity guides, and other supplemental teaching supplies. Several teachers expressed the demand to find new and innovative resources to teach agriculture topics; however, teachers have limited time to search for educational resources and effectively implement these educational resources in their classrooms. For example, during the school year, Mary explained the various tasks and roles (i.e., teacher of various courses, student organization leader) she has as a CTE teacher within her school district. Mary stated that she enjoys teaching food science in her courses; however, "it's just a lot on [her] plate, and to be able to just open the

[food science toolkit] book ... it helped organize my thoughts,” and Mary was able to implement the food science toolkit. In addition, other teachers explained their appreciation for the lesson plans, scripts, and other teaching resources that supported a positive and simple implementation experience.

Theme 4: Student Engagement

Teachers discussed that student engagement was the most meaningful experience acquired during the food science lessons and activities. For example, Emma described her experience teaching her students food chemistry concepts, and she expressed, “The most meaningful was seeing [the] kids’ reaction [to the candy chemistry activity].” During the candy chemistry activities, teachers explained the science involved in making hard candy. They observed that students were engaged and had positive reactions towards the simplicity of applying learned food science concepts to successfully make hard rock candy to enjoy at the end of class. In addition to observing how engaged her students were during the food science lessons, Sarah discussed how her students continuously presented intriguing questions during class discussions and the students’ desire to engage in additional food science lessons. Specifically, Sarah shared, “[food science] is a topic that [the students] are not scared to ask about [be]cause they feel good about food.”

Research Question Three: What were the perceptions of the CTE teachers towards the quality of the food science educational resources and implementation process?

Data analysis resulted in three prominent themes for teachers’ perceptions towards the quality of the food science toolkit and the implementation process: (1) organizational structure of resources, (2) useful and relatable resources, and (3) desire for additional resources/opportunities.

Theme 1: Organizational Structure of Resources

All teachers expressed that the food science education resources were well organized, and it was easy to follow the design of the lessons and the overall implementation process. One teacher expressed, “[the food science toolkit] made putting the lessons together a whole lot ... easier, which you’re more apt to do [the lesson] ... as a busy teacher, if you have it on hand ... so that was very beneficial.” A teacher also noted that “even if [a teacher is] not proficient [in] food science, ... everything’s laid out, it’s scripted, you’ve got examples and the videos and everything ... it’s a good set of information.” In addition, all teachers provided positive feedback regarding the organizational design of the food science teaching materials, such as the lesson plans, PowerPoint slides, and student activity guides and worksheets.

Theme 2: Useful and Relatable Resources

The usefulness and relatability of the food science toolkit to CTE students and teachers contributed to the quality of the toolkit. Emma described the objectives of the food science lessons as “adequate” for the targeted age group. She also expressed, “the kids understood it, and it was actually useful to them in their real life.” The food science toolkit was also described as a useful tool for teachers. One teacher expressed that “[the food science toolkit] would be very helpful for [teachers] that are still learning the whole food science process. ... This would definitely give them information on what they need to know [and what] to say.”

Theme 3: Desire for Additional Resources/Opportunities

All teachers expressed their desire for additional food science teaching resources to implement in their CTE courses. The teachers described how they incorporated lesson extensions to several of the food science lessons, and they also provided possible recommendations for enhancing the food science toolkit. Several teachers stated how they extended the food science lessons by showcasing additional food processing videos or invited guest lecturers to elaborate further on food science-related topics. One teacher conveyed that “after [her class] had done everything in [the food product development] lesson, [she] made them design a new product, and [she instructed] them [to] make a package” to continue students’ application of learned food science concepts. Additionally, the teacher further extended the lesson by “actually show[ing] [the students] how to come up with their carb[ohydrate]s, fats, protein[s] and get their calories.” Furthermore, one teacher expressed her desire for resources that provide students with opportunities to connect with food science professionals. Teachers’ desire for additional resources and learning opportunities identifies ways that the research team can enhance the food science teaching resources.

Research Question Four: Why would CTE teachers continue to use these food science educational resources?

All teachers stated that they would continue to use the food science toolkit in their classes and provided reasons to support their selected choice. Data analysis resulted in two emerging themes from the teachers’ responses: (1) preparation for FFA Food Science CDE and (2) new education experiences.

Theme 1: Preparation for FFA Food Science CDE

Considering teachers’ interest in teaching food science to enhance student training and performance for/on the FFA food science CDE, it is not surprising that teachers desired to continue to use the food science toolkit for preparation for the FFA Food Science CDE. For example, one teacher stated she would have teams participate in future FFA Food Science CDEs, and she expressed that “this is good training material” for the competition. Another teacher

discussed how she would continue to use the food science toolkit to prepare her FFA teams for the Food Science CDE; however, she would also “tie [the food science toolkit] in with [her] FFA, giving [the students] ... knowledge to see whether or not they are interested in the competition.”

Theme 2: New Education Experiences

Several teachers stated that they would continue to use the resources because of the new educational experiences that the food science toolkit provides. Christine stated that continuing to use the food science toolkit “would give [the students] an opportunity to learn something new and different and experience something new, like the sensory [evaluation content].” Additionally, one teacher expressed that food science is “very pertinent in our day-to-day life,” and the food science toolkit offers opportunities to “expose [the students] to some new things” and different experiences while forwarding the opportunity of “understanding the why’s” of food science.

Discussion

This research study was centered on four core topics of interest: (1) teacher interest in teaching food science, (2) teacher experience implementing food science education resources, (3) teacher perception of food science education resources, and (4) teacher’s reasons for continued use of the food science education resources.

Teacher Interest in Teaching Food Science

The study findings revealed that teachers are interested in teaching food science in secondary CTE courses because they desire to increase knowledge of food science among their students and to enhance student training and performance on the FFA food science CDE. Due to the growing demand for innovative food products, the current strong interest in food and overall wellness, and the steady growth in the U.S. population, there is a growing need for science-literate people who are more aware, knowledgeable, and technically trained in the field of food science and technology. In 2007, Peacock examined the effects of food science-based instruction on high school students. It was determined that teaching food science at the secondary level increased the number of students that were more aware and knowledgeable of food science and that would select food science as a college major (Peacock, 2007). These findings indicate that teachers’ interest in teaching food science should be cultivated further to extend food science-based instruction at the secondary education level and to increase knowledge of food science among students.

Teachers described how their interest in teaching food science is motivated by their desire to enhance student training and performance on the FFA food science CDE. The FFA Food Science and Technology (FST) CDE is a student professional development opportunity in which students

can showcase and apply their knowledge and skills pertaining to food product development, food safety issues, and sensory evaluation skills (National FFA Organization, 2019a, 2019b). As more Mississippi CTE teachers pursue opportunities to enhance students' training and performance for/on the FFA food science CDE, there is potential to increase CTE students' practical experiences in which they can apply their knowledge and skills in the field of food science, hence, supporting FFA's overall mission to "develop youth through premier leadership, personal growth, and career success" (National FFA Organization, 2021a).

Teacher Experience Implementing Food Science Education Resources

Four prominent themes were identified among teachers' responses characterizing their experience implementing the food science education resources: (1) teacher passion yields increased promotion, (2) teacher interest in specific lessons, (3) implementation process eased by food science toolkit, and (4) student engagement. The food science lessons were designed to be introductory lessons to expose students to food science curriculum competencies and the activities included in the food science toolkit. Teachers' pre-existing passion for food science supported the increased promotion of food science education resources among their students, and the teachers' feedback towards specific food science lessons and activities revealed how the food science education resources stimulated the students' interest and curiosity in the field.

Teachers discussed how their experience implementing food science education resources was made easier through the use of the food science teaching toolkit. These findings are similar to Kahnke and others (2006), who examined the effectiveness of a dairy foods curriculum package that they developed for high school agriculture education teachers in South Dakota. It was determined that providing teachers with "ready-made" educational resources enhanced high school dairy education (Kahnke et al., 2006). Developing and providing CTE teachers education resources to teach subjects like food science can be used to support curriculum design and development, ensure successful implementation of food science lessons and activities, and increase the amount of instructional time allotted to teach food science on the secondary education level.

In addition, teachers' experience implementing food science education resources was characterized by how the students were engaged in the food science lessons and activities. Schmidt and others (2012) examined the implementation of food science demonstrations at the secondary and postsecondary levels and obtained similar results. Students were highly engaged in the food science lessons and actively participated in the demonstrations by asking questions that generated further class discussion (Schmidt et al., 2012). The findings from this study indicate that implementing the food science toolkit in high school CTE classes can increase students' engagement in and satisfaction with their learning experiences, which ultimately can lead to them pursuing future food science academic and career opportunities.

Teacher Perception of Food Science Education Resources

Teachers' perceptions of education resources can impact curriculum design and development and curriculum adoption and usefulness. After implementing the food science education resources, teachers' perceived that the resources were organized, structured, useful, and relatable. Previous studies identified the absence of "appropriate" agriculture-related instructional resources for teachers as a potential barrier to the proper implementation of new learning material (Ham & Sewing, 1987; Trexler et al., 2000). Therefore, it is important to supply teachers with educational resources that are organized and designed for effective implementation. In addition, the organizational design of the food science toolkit can be used as a model for future CTE curriculum design and development.

With the extensive display and promotion of food, nutrition, and overall health on all varying media platforms, having food science-based instruction taught at the secondary education level is "extremely relevant" to supporting and/or combating food and health-related information that is presented to the public (Schmidt et al., 2012). Schmidt and others (2012) also determined that students observed food science's relevance and significance in their day-to-day lives when food science-based instruction was implemented at the secondary education level (Schmidt et al., 2012). Based on teacher perception of the lessons, these findings indicate that the food science toolkit has the potential to be a useful and relatable tool among students and teachers when implemented in Mississippi CTE courses.

Teachers' Reasons for Continued Use of the Food Science Education Resources

The research study revealed that teachers would continue to use food science education resources to prepare for the FFA FST CDE and to provide their students with new educational experiences.

The national FFA organization states that the food science CDE is designed to help increase student knowledge and technical skills in the field of food science (National FFA Organization, 2021b). Using the food science toolkit to prepare students for the FFA FST CDE has the potential to enhance student CTE learning experiences, which ultimately can increase the number of students who pursue academic and career pathways in food science. Additionally, providing students with new education experiences via food science education resources can further promote research findings by Brand (2008), who described how students are encouraged to pursue higher education when participating in CTE courses at the secondary education level because students can bridge their current interest to their future career goals. Schmidt and others (2012) also stated that the students who engage in food science demonstrations and lessons are more aware and interested in food science competencies and opportunities in the field. New education experiences that are provided by the implementation of the food science toolkit can further increase exposure to food science competencies among Mississippi CTE students and potentially help students make an inclusive decision about selecting food science as a postsecondary education or career pathway.

Limitations

The geographic scope of this study was limited due to the sole inclusion of Mississippi (MS) agriculture CTE teachers. Therefore, the results cannot be generalized to CTE teachers outside of MS. The small sample size also prevents the generalization of study results among varying populations. The abrupt closing of MS schools due to the onset of the COVID-19 pandemic caused changes to data collection procedures and decreased the number of teachers that were available to implement the food science educational resources.

Conclusions

There are several studies that examine the implementation of specific food science concepts at the secondary education level; however, there are a limited number of studies that examine teachers' perceptions towards the implementation of secondary education food science resources. The research results indicated that Mississippi CTE teachers had positive experiences implementing the food science toolkit and perceived that implementing the toolkit was useful in implementing food science education in Mississippi CTE courses. Teachers also expressed that implementing the food science toolkit increased student exposure to, engagement in, and interest in food science academic and career pathways, which empowers students to select and pursue a career in food science.

Implications for Future Practice

These research results cannot be generalized to all cases where food science educational resources are implemented; however, the results of this study offer several implications for curriculum developers, state and district-level school administrators, and university food science faculty and staff. Curriculum developers can use teachers' perceptions of specific food science lessons to assist with modifying and enhancing curricula design. Participating teachers cited several reasons for their interest in specific food science lessons (i.e., stimulated interest in food science among students and the ability to expand lesson content to teach other related topics) that would allow curriculum developers to enrich further teaching resources before reimplementation. Curriculum developers can also use the results garnered from the food science toolkit as a model to develop additional resources to enhance student performance in various FFA student competitions.

Research findings also offer implications for state and district-level school administrators. With an increased focus on ensuring students are college and career-ready, state and district-level school administrators can use teachers' insights to assess the adoption of innovative resources that are designed to prepare students for various career pathways. Additionally, teacher feedback from the food science toolkit provides students with new educational experiences and data to help state and district-level administrators approve food science curricula for classroom instruction.

The results are useful to university food science faculty and staff who desire to promote food science academic and career pathways. Teacher feedback can inform university food science faculty and staff on how to promote food science-based instruction among secondary education teachers more effectively. These findings also demonstrate how university food science faculty and staff can enhance student recruitment in the field of food science by strengthening university and secondary education partnerships.

Recommendations for Future Work

Future research should consider implementing the food science toolkit among a larger population of Mississippi CTE teachers to identify additional teacher perceptions when implementing the food science toolkit and to examine differences in implementation among participating teachers. In addition, future research should explore process indicators that depict implementation reach, dose, and fidelity to obtain an in-depth understanding of the implementation process, which can assist in improving the food science toolkit design. The studies can also examine non-CTE teachers' perceptions of the food science toolkit. By studying non-CTE teachers' perspectives, researchers can explore the cross-curricular aspects of the food science toolkit as well as converge CTE and non-CTE teachers' varying perspectives to determine consistency among study conclusions. In doing so, the food science toolkit can be implemented in additional STEM subject areas, ultimately increasing the number of teachers implementing food science curriculum and the number of students that are exposed to food science educational resources. It is also essential to evaluate how the students are impacted by the food science resources implemented in their classes; therefore, it is recommended for researchers to explore student awareness and knowledge of food science pre and post-implementation of the food science toolkit in MS CTE courses. Continuing this research to increase awareness of food science academic and career pathways at the secondary education level can help further develop a talent pipeline of educated and skilled food science graduates that enter the field of food science.

References

- Bell, P. (2014). Design of a food chemistry-themed course for nonscience majors. *Journal of Chemical Education*, 91(10), 1631–1636. <https://doi.org/10.1021/ed4003404>
- Bohlscheid, J. (n.d.). *Sensory evaluation CDE preparation*. University of Idaho. Retrieved November 9, 2019, from https://www.cusd80.com/cms/lib/AZ01001175/Centricity/Domain/4991/Sensory_CDE_training.ppt
- Brand, B. (2008, May). Supporting high quality career and technical education through federal and state policy. In *American Youth Policy Forum* (Vol. 1, p. 16). American Youth Policy Forum.
- Creswell, J. W. (2009). *Research design: Qualitative, quantitative, and mixed methods approaches*. SAGE Publications.

- Crist, C., Schilling, M. W., Jackson, V., & Williams, J. B. (2021). Candy making (Hard-crack stage, 300°F). In *Experiments in Food Science Laboratory Manual* (Publication P2469; p. 5). <http://extension.msstate.edu/publications/experiments-food-science-laboratory-manual>
- Exploratorium. (n.d.). *Yeast-air balloons*. <https://www.exploratorium.edu/cooking/bread/activity-yeast.html>
- Gardner A. (n.d.). *Food scientist for a day*. National Agriculture in the Classroom. <https://agclassroom.org/matrix/lesson/616/>
- Glo Germ. (n.d.). *Handwashing training*. <https://www.glogerm.com/handwashing.html>
- Ham, S. H., & Sewing, D. R. (1987). Barriers to environmental education. *Journal of Environmental Education*, 19(2), 17–24. <https://doi.org/10.1080/00958964.1988.9942751>
- Han, S. S., & Weiss, B. (2005). Sustainability of teacher implementation of school-based mental health programs. *Journal of Abnormal Child Psychology*, 33(6), 665–679. <https://doi.org/10.1007/s10802-005-7646-2>
- Hendrix, J. D., Campbell, Y. L., Zhang, X., Downey, L. H., Jagger, C. B., & Schilling, M. W. (2021). Delivery and evaluation of a food science professional development training for Mississippi career technical education teachers. *Journal of Food Science Education*, 20(4), 197–207. <https://doi.org/10.1111/1541-4329.12228>
- Hsieh, H. F., & Shannon, S. E. (2005). Three approaches to qualitative content analysis. *Qualitative Health Research*, 15(9), 1277–1288. <https://doi.org/10.1177/1049732305276687>
- Institute of Food Technologists. (n.d.). *K-12 teaching resources*. <https://www.ift.org/community/educators/k12-teaching-resources>
- Jideani, V. A., & Jideani, I. A. (2010). A model for education and promoting food science and technology among high school students and the public. *African Journal of Biotechnology*, 9(31), 4826–4835. <https://www.ajol.info/index.php/ajb/article/view/92027>
- Kahnke, S. L., Baer, R. J., & Portillo, M. T. (2006). Development and effectiveness of a dairy foods curriculum packet and inservice and the assessment of barriers to dairy foods education. *Journal of Food Science Education*, 5(1), 1–8. <https://doi.org/10.1111/j.1541-4329.2006.tb00068.x>
- Kondracki, N. L., Wellman, N. S., & Amundson, D. R. (2002). Content analysis: Review of methods and their applications in nutrition education. *Journal of Nutrition Education and Behavior*, 34(4), 224–230. [https://doi.org/10.1016/S1499-4046\(06\)60097-3](https://doi.org/10.1016/S1499-4046(06)60097-3)
- McEntire, J. C., & Rollins, M. (2007). A two-pronged approach to promote food science in U.S. high schools. *Journal of Food Science Education*, 6(1), 7–13. <https://doi.org/10.1111/j.1541-4329.2007.00016.x>
- Meter, K., & Goldenberg, M. P. (2014). An overview of the Mississippi farm and food economy. *Crossroads Resource Center*, 66. <https://crcworks.org/msfood.pdf>

- National FFA Organization. (2019a). *Career and leadership development events*. Retrieved July 30, 2021, from <https://www.ffa.org/participate/cde-lde/>
- National FFA Organization. (2019b). *Career and leadership development events*. Retrieved August 2, 2021, from <https://www.ffa.org/participate/cdes/food-science-and-technology/>
- National FFA Organization. (2021a). *FFA vision, mission, and motto*. Retrieved July 28, 2021, from <https://www.ffa.org/about/who-we-are/mission-motto/>
- National FFA Organization. (2021b). *Food science & technology*. Retrieved August 2, 2021, from <https://www.ffa.org/participate/cdes/food-science-and-technology/>
- Peacock, A. R. (2007). *Food science-based instruction: The pathway to greater interest in high school science and increased enrollment in university food science programs* [Doctoral dissertation, University of Georgia].
- Rowley, A., & Peacock, J. (n.d.a). *I'm eating what?*
<https://extension.uga.edu/content/dam/extension/programs-and-services/science-behind-our-food/documents/ImEatingWhat.pdf>
- Rowley, A., & Peacock, J. (n.d.b). *One of these things is not like the other*.
<https://extension.uga.edu/content/dam/extension/programs-and-services/science-behind-our-food/documents/OneofTheseThings.pdf>
- Schmidt, S. J., Bohn, D. M., Rasmussen, A. J., & Sutherland, E. A. (2012). Using food science demonstrations to engage students of all ages in science, technology, engineering, and mathematics (STEM). *Journal of Food Science Education*, 11(2), 16–22.
<https://doi.org/10.1111/j.1541-4329.2011.00138.x>
- Shearer, A. E., Snider, O. S., & Kniel, K. E. (2014). Implementation and assessment of food safety educational materials for secondary and postsecondary education. *Journal of Food Science Education*, 13(1), 4–11. <https://doi.org/10.1111/1541-4329.12017>
- Trexler, C. J., Johnson, T., & Heinze, K. (2000). Elementary and middle school teacher ideas about the agri-food system and their evaluation of agri-system stakeholders' suggestions for education. *Journal of Agricultural Education*, 41(1), 30–38.
<http://doi.org/10.5032/jae.2000.01030>

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Acknowledgment

The research was funded through a grant from Mississippi State University's Mississippi Agricultural and Forestry Experiment Station Special Research Initiative.

Convenience Over Nutrition for Recreation League Youth Sport Team Snack and Mealtime Choices

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Fifty-six percent of school-aged children participate in team sports, yet there is limited evidence on how participation in youth sports impacts the dietary behaviors of participants and their families. Our team surveyed parents and caregivers of children participating in recreation league youth sports ($n = 178$) to assess the foods and beverages offered as team snacks and factors that influence team snack choices. Juice was the most popular beverage, and crackers were the most popular snack reported by parents. Convenience, followed by cost and child preference, were the most frequently reported factors influencing team snack choices. Survey items also included factors that influence mealtime behaviors on game and practice days. Convenience, followed by nutrition and taste, were most frequently reported as factors that influenced mealtime behaviors. Almost half of parents said their family's eating habits changed as a result of recreational youth sports activities, and more than half said their family often or always eats dinner outside of the home on game and practice days. Professionals who work with this age group and their parents, including extension agents, can tailor education to encourage healthy team snacks and promote strategies to make healthy meals accessible on evenings with youth sports.

Keywords: nutrition, physical activity, youth sports, snacks, family meals

Introduction

As of 2018, 56% of children 6–12 years old participated in team sports, and 38% reported regularly playing on sports teams throughout the year (The ASPEN Institute, 2019). The commitment of time and other family resources, the impact on routines and scheduling, and the foods available at games and practices all influence the eating behaviors of youth sports participants and their families. To protect and maximize youth sports as a health-promoting part of childhood, the impact on nutrition and mealtime requires more consideration.

Team snacks, provided through a volunteer effort by parents, are a norm in recreation league youth sports (Bennion et al., 2020; Rafferty et al., 2018; Spruance et al., 2019; Thomas et al.,

2012; Yoshinaga et al., 2020). Parents' decisions around the foods and beverages offered for team snacks are influenced by cost, convenience, children's preferences, social norms, efforts to balance healthful with less healthful items, and meal timing (Rafferty et al., 2018). Parent perceptions of team snacks as a reward have created a tradition of offering foods that are considered "treats" as team snacks (Irby et al., 2014; Rafferty et al., 2018; Spruance et al., 2019; Thomas et al., 2012). An observational study of team snacks offered in recreation league youth sports found that baked goods, fruit snacks, crackers, and chips were among the most popular team snacks and that sugar-sweetened beverages were offered as part of the majority of snacks (Bennion et al., 2020).

Beyond team snacks, participation in youth sports impacts dietary behaviors for the household (Chircop et al., 2013; Irby et al., 2014). In many families, mealtime is scheduled around games and practices, leading to increased reliance on takeout, fast food, and convenience options (Chircop et al., 2013; Larson et al., 2020). Recently it was observed that 56% of parents with a child involved in sports reported that sports interfered with family meals (Larson et al., 2020). These parents reported less frequent family meals and more frequent purchases from fast food restaurants (Larson et al., 2020).

Research on team snacks and the impact of recreation league youth sport participation on mealtime is limited (Bennion et al., 2020; Irby et al., 2014; Rafferty et al., 2018; Spruance et al., 2019; Thomas et al., 2012; Yoshinaga et al., 2020). Recreation leagues are generally less of a time and financial commitment and, therefore, may attract more children and impact more families, compared to competitive leagues. Our study was designed to explore behaviors and beliefs related to team snacks and the impact of games and practices on mealtime within recreation league youth sports.

Methods

Recruitment

Participants were recruited at youth recreation fields in four counties in central North Carolina during games and practices for recreation league youth sports. Those who identified as a parent or guardian of a child aged 5–12 years playing on a soccer, football, or flag-football team and who were fluent in English were invited to participate in the study. Permission to distribute surveys was granted by league Athletic Directors or the host recreation facility. Study participants were made aware of the study requirements through consent forms detailing collection procedures and the protection of confidential information. Protocols were approved by the University of North Carolina Greensboro human subjects review board.

Survey Design

Study participants, herein referred to as “parents,” completed a 13-question survey designed to assess food and beverage choices for team snacks, factors that influenced team snack choices, mealtime behaviors, and factors that influenced mealtime behaviors on game and practice days. The surveys were completed on paper, took about five minutes to complete, and members of the research team were available to clarify questions as needed. Prior to use for this study, the survey was content validated by nutrition faculty at the University of North Carolina Greensboro. Face validation was performed with parents at a randomly chosen soccer practice prior to data collection.

Responses to some questions were assessed on a three-point Likert scale. The researchers considered participant burden and the descriptive nature of the study when deciding to use a three-point scale in their survey design.

Parents self-reported their race and gender, and provided the number of children living in their household. They also provided the age and gender of their youth sports participant child and the sport in which the child was participating.

Team snacks were assessed with the following open-response question: “When it is your turn to provide snacks for your child’s sports recreation team, please list the snack (food and drink) choices you most often make.” Parents were asked to indicate factors that most influenced their team snack choices. Cost, convenience, nutrition, taste, and child’s preference were provided as fixed responses, and participants could provide additional responses under *other*. In separate questions, parents were asked to indicate how important they felt it was for their child’s team to provide team snacks and how important it was for team snacks to be healthy by selecting from *not important*, *important*, or *very important*. Game duration was assessed with the question: “About how long do these games last?”

Factors that influenced dinner choices on game and practice nights were assessed with the following question: “On game and/or practice nights, what influences your decision on what to eat for dinner?” Cost, convenience, nutrition, taste, and child’s preference were provided as fixed responses, and participants could provide additional responses under *other*. Parents were asked to indicate whether they *seldom*, *often*, or *always* ate dinner at home and outside of the home on game and practice evenings. A three-point scale was also used for these questions to limit participant burden.

A total of 200 surveys were completed. Surveys completed by parents of children younger than 5 years old and older than 12 years old were excluded from our analyses, resulting in a sample of 178 participants.

Data Analysis and Statistics

A descriptive analysis of survey responses was performed using SPSS Version 28.0. Frequency analyses were conducted for survey items related to perceptions of team snacks provided at youth recreation sporting events, team snack and beverage choices, factors influencing team snack and dinner choices, and household mealtime behaviors. Chi² analyses were used to assess for differences in the percentage of parents who reported cost, convenience, nutrition, taste, and child's preference as important factors when making team snack and mealtime choices by child age, child gender, and number of children in the household. Chi² analyses were also used to assess for differences in the percentage of parents who said their family's eating habits changed as a result of youth sports by sport type. Finally, Chi² analyses were run to assess for differences in the percentage of parents who said their family *seldom*, *often*, or *always* eats out on game and practice nights by sport type.

Results

Of the parents who provided race/ethnicity data ($n = 162$), most were white (70.4%). Of the parents who identified their gender ($n = 147$), most were female (69.4%). Households had an average of 2.24 children. The mean age of the youth sports participants was 8.25 years old. The length of the average game was 55.40 minutes.

Child sport was collected from 178 parents (58.4% soccer, 28.1% flag football, 13.5% football). Child gender was collected from 174 parents (67.2% male, 32.8% female). Male children made up 53%, 80%, and 100% of the children who played soccer, flag football, and football, respectively.

Table 1. Participant Race and Ethnicity Data ($n = 162$)

Race/Ethnicity	<i>n</i>	%
White	114	70.4%
Black	32	19.8%
Multiple/Mixed	10	6.2%
Hispanic	4	2.5%
American Indian	1	.6%
Asian	1	.6%

Note. The total dataset includes 178 parents. Some parents ($n = 16$) did not provide data on race and ethnicity.

Of the surveys that indicated typical team snack beverage choices, juice was the most popular beverage, followed by water and sports drinks. Crackers were the most popular snack food, followed by chips, fruit, and sweets like cookies, cupcakes, snack cakes, and rice crispy treats. Team snack and beverage choices are listed in Table 2.

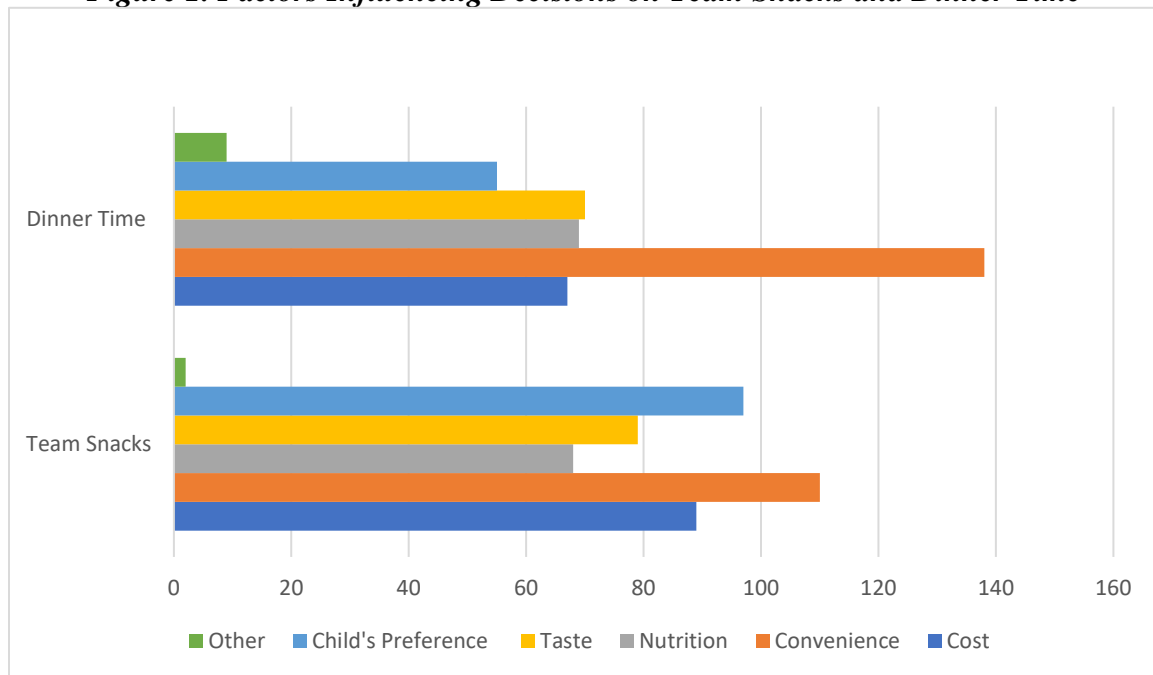
Table 2. Reported Team Snack and Beverage Choices

Snacks (n = 163)	n	%
Crackers	67	41.1%
Chips	61	37.4%
Fruit	28	17.2%
Cookies, Cupcakes, Snack cakes, Rice crispy treats	22	13.5%
Granola bars	11	6.7%
Pretzels, Cheese puffs, Popcorn, Snack mix	9	5.5%
Fruit snacks/gummies	7	4.3%
Dairy (Cheese sticks, yogurt)	2	1.2%
Pizza	1	0.6%
Beverages (n = 162)	n	%
Juice	99	61.1%
Water	38	23.5%
Sports Drinks	30	18.5%
Fruit Drinks and Lemonade	4	2.5%
Flavored Water	4	2.5%
Milk	1	0.6%

Note. Survey responses to “When it is your turn to provide snacks for your child’s sport recreation team, please list the snack (food and drink) choices you most often make.” These values exceed 100% of participants because many participants listed more than one snack or beverage in their survey responses.

In terms of team snacks, 69.7% of parents reported that it is important that snacks are provided at recreation league sporting activities, and 84.8% of parents reported that it is important for team snacks to be healthy.

Convenience was the most frequently indicated factor that influenced team snack choices, followed by child’s preference, cost, taste, and nutrition (see Figure 1). There were no significant differences in the percentage of parents who identified each factor (cost, convenience, nutrition, taste, or child’s preference) as important when choosing team snacks by child age or child gender. There was a significant difference in the percentage of parents who said cost was an important consideration when making team snack choices by the number of children in the household. Cost was important to 62.9% of parents with one child, 53.6% of parents with two children, 54.3% of parents with three children, and 12.5% of parents with four or more children ($p = .008$). There were no significant differences observed in the percentage of parents who identified convenience, nutrition, taste, or child’s preference as important when choosing team snacks by the number of children in the household.

Figure 1. Factors Influencing Decisions on Team Snacks and Dinner Time

Note. Survey responses to “On game and/or practice nights, what influences your decision on what to eat for dinner?” (top) and “What most influences your decision about what snacks (food and drink) to bring for your child’s sport recreation team?” (bottom). X-axis reflects the number of survey respondents who indicated each factor influenced their decision.

Convenience was also the most frequently reported factor that influenced mealtime on game and practice days, followed by taste, nutrition, cost, and child’s preference (see Figure 1). There were no significant differences in the percentage of parents who identified any of the five factors as important when making mealtime choices by child age or child gender. There were significant differences in the percentage of parents who reported cost and taste as important considerations for mealtime by the number of children in the household. Cost was important to a higher percentage of parents with one child compared to parents with two, three, and four or more children (57.1%, 34.5%, 31.4%, and 18.8%, respectively; $p = .029$). Taste was also important to a higher percentage of parents with one child compared to parents with two, three, and four or more children (45.7%, 41.7%, 37.1%, and 6.3%, respectively; $p = .042$). There were no significant differences in the percentage of parents who reported convenience, nutrition, or child’s preference as important for mealtime by number of children in the household.

Of the 178 parents who participated in the survey, 49.7% indicated their family’s eating habits changed as a result of recreational youth sports activities. A higher percentage of soccer parents said their family’s eating habits changed as a result of youth sports compared to football and flag football parents (61.2%, 45.8%, and 28%, respectively; $p < .001$).

Of the 178 parents who participated in the survey, 60.8% said their family often or always eats dinner outside of the home on game and practice nights. A higher percentage of flag football

parents said their family often or always eats out on game and practice nights compared to soccer and football parents (88%, 51.9%, and 41.6%, respectively; $p < .001$).

Discussion

The results of our study add to the existing literature suggesting that recreation league youth sports may result in an increased frequency of poor dietary behaviors, highlighted by the provision of unhealthy team snacks and the disruption of mealtimes.

American children consistently exceed the Dietary Guidelines for American's recommendation to limit added sugars to <10% of total calories, and juice-based and fruit beverages are major contributors (Bailey et al., 2018). U.S. children also exceed recommendations for sodium, and savory snacks are among the top ten contributors of dietary sodium among school-aged children (Quader et al., 2017). Crackers, chips, and juice were the most popular team snack and beverage choices in our sample, suggesting that team snacks could be a contributing source of nutrients that are already excessive in many children's diets.

While the majority of parents felt it was important for team snacks to be healthy, this was not reflected in the types of snacks reported. Water was only offered by 23.5% of parents, suggesting there is work to be done in promoting water as the ideal beverage in recreation league youth sports. Fruit was only offered by 17.2% of parents. The infrequent offering of healthy team snacks is not unique to the parents in our sample, nor are the factors that parents cited as influencing their team snack choices. Convenience, child's preference, and cost have been named as influential factors of team snack choices in other studies (Bennion et al., 2020; Rafferty et al., 2018; Spruance et al., 2019; Thomas et al., 2012; Yoshinaga et al., 2020). Parents of little league baseball players reported giving their child control over what was selected for the team snack, with limits around cost and preparation time (Rafferty et al., 2018). Convenience and child's preference were also among the top three factors that influenced team snack choices among parents of youth basketball players (Yoshinaga et al., 2020). Our results suggest that it is more important for team snacks to fit within the parents' time and financial resources and align with child preferences than it is for the snack to be healthy. To accommodate priorities around convenience and cost, other authors have made practical suggestions to limit the number of foods to one or two items and have each child bring their own water (Rafferty et al., 2018; Thomas et al., 2012). This approach may effectively decrease the burden of providing team snacks and increase the healthfulness of team snacks.

Our finding that nutrition was the least frequently reported factor to influence team snacks suggests that parents might perceive team snacks as "treats," as has been documented in other studies (Irby et al., 2014; Rafferty et al., 2018; Spruance et al., 2019; Thomas et al., 2012; Yoshinaga et al., 2020). Many of those same studies found that social norms discourage those who wish to see healthier options from straying from the "treats" that are expected (Irby et al., 2014; Rafferty et al., 2018; Spruance et al., 2019; Thomas et al., 2012).

Nearly half of parents said their family's eating habits were changed as a result of recreation league youth sports, and more than half of parents said their family often or always eats out for dinner on game and practice nights. Convenience, the most frequently reported factor influencing dinner decisions on practice and game nights, could explain the large percentage of families who reported regularly eating out on such nights. It is likely that the number of families in our study who eat foods prepared outside the home on practice and game nights is even higher than 60.8%, as our survey addressed where dinner is eaten rather than where it is prepared. Frequent consumption of restaurant-prepared meals is associated with increased energy intake, decreased intake of fruits and vegetables, and lower overall diet quality, whereas more frequent home cooking is associated with overall higher diet quality (An, 2016; Barnes et al., 2016; Wolfson et al., 2020). A significantly greater risk for overweight and obesity was observed for adolescents and their parents when dinner was purchased from a restaurant on a weekly basis (Fulkerson et al., 2011). While the children in our sample were school-aged, this association highlights how mealtime behaviors could impact families as children age into adolescence.

Our results related to team snacks and mealtime raise the concern that recreation league youth sport participation could increase the likelihood of poor dietary behaviors and their health-related outcomes in participants and their families.

Limitations

This study was a cross-sectional, descriptive study that utilized a convenience sample and was conducted in a limited geographic area. The resulting sample had limited racial diversity. So, our results may not extend to recreation leagues in other geographic locations or serving more diverse populations. Additionally, ten parents who participated in face validation were included in the full sample.

Implications

Team snacks may be an overlooked source of some nutrients that are already excessive in many children's diets. Professionals who work with this age group and their parents, including extension agents, can tailor education to encourage healthy team snacks within recreation league youth sports. Interventions that aim to reduce the frequency or increase the healthfulness of meals eaten outside the home may also be valuable for families with children participating in recreation league youth sports. It may be important to consider differences in mealtime behaviors by sport type when working with this population.

Children's participation in recreational league sports should not alter eating habits in a way that increases the risk for poor diet-related health outcomes. Our work highlights the opportunity to encourage health among youth sports participants and their families.

References

- An, R. (2016). Fast-food and full-service restaurant consumption and daily energy and nutrient intakes in US adults. *European Journal of Clinical Nutrition*, 70(1), 97–103.
<https://doi.org/10.1038/ejcn.2015.104>
- The ASPEN Institute. (2019). *2019 state of play: Trends and developments in youth sports* (p. 3). The Aspen Institute Project Play. https://www.aspeninstitute.org/wp-content/uploads/2019/10/2019_SOP_National_Final.pdf
- Bailey, R., Fulgoni, V., Cowan, A., & Gaine, P. (2018). Sources of added sugars in young children, adolescents, and adults with low and high intakes of added sugars. *Nutrients*, 10(1), Article 102. <https://doi.org/10.3390/nu10010102>
- Barnes, T. L., French, S. A., Mitchell, N. R., & Wolfson, J. (2016). Fast-food consumption, diet quality and body weight: Cross-sectional and prospective associations in a community sample of working adults. *Public Health Nutrition*, 19(5), 885–892.
<https://doi.org/10.1017/S1368980015001871>
- Bennion, N., Spruance, L. A., & Maddock, J. E. (2020). Do youth consume more calories than they expended in youth sports leagues? An observational study of physical activity, snacks, and beverages. *American Journal of Health Behavior*, 44(2), 180–187.
<https://doi.org/10.5993/AJHB.44.2.6>
- Chircop, A., Shearer, C., Pitter, R., Sim, M., Rehman, L., Flannery, M., & Kirk, S. (2013). Privileging physical activity over healthy eating: ‘Time’ to Choose? *Health Promotion International*, 30(3), 418–426. <https://doi.org/10.1093/heapro/dat056>
- Fulkerson, J. A., Farbachsh, K., Lytle, L., Hearst, M. O., Dengel, D. R., Pasch, K. E., & Kubik, M. Y. (2011). Away-from-home family dinner sources and associations with weight status, body composition, and related biomarkers of chronic disease among adolescents and their parents. *Journal of the American Dietetic Association*, 111(12), 1892–1897.
<https://doi.org/10.1016/j.jada.2011.09.035>
- Irby, M. B., Drury-Brown, M., & Skelton, J. A. (2014). The food environment of youth baseball. *Childhood Obesity*, 10(3), 260–265. <https://doi.org/10.1089/chi.2013.0161>
- Larson, N., Fulkerson, J. A., Berge, J. M., Eisenberg, M. E., & Neumark-Sztainer, D. (2020). Do parents perceive that organized activities interfere with family meals? Associations between parent perceptions and aspects of the household eating environment. *Journal of the Academy of Nutrition and Dietetics*, 120(3), 414–423.
<https://doi.org/10.1016/j.jand.2019.11.008>
- Quader, Z. S., Gillespie, C., Sliwa, S. A., Ahuja, J. K. C., Burdg, J. P., Moshfegh, A., Pehrsson, P. R., Gunn, J. P., Mugavero, K., & Cogswell, M. E. (2017). Sodium intake among US school-aged children: National Health and Nutrition Examination Survey, 2011–2012. *Journal of the Academy of Nutrition and Dietetics*, 117(1), 39–47.e5.
<https://doi.org/10.1016/j.jand.2016.09.010>

- Rafferty, A., Gray, V. B., Nguyen, J., Nguyen-Rodriguez, S., Barrack, M., & Lin, S. (2018). Parents report competing priorities influence snack choice in youth sports. *Journal of Nutrition Education and Behavior*, 50(10), 1032–1039. <https://doi.org/10.1016/j.jneb.2018.04.275>
- Spruance, L. A., Vaterlaus, J. M., Haines, A., & Walker, J. (2019). “Please bring a healthy snack”: An exploratory study on parent experiences with post-game snacks and beverages in youth sports. *Journal of Park and Recreation Administration*, 38(2). <https://doi.org/10.18666/JPRA-2019-9985>
- Thomas, M., Nelson, T. F., Harwood, E., & Neumark-Sztainer, D. (2012). Exploring parent perceptions of the food environment in youth sport. *Journal of Nutrition Education and Behavior*, 44(4), 365–371. <https://doi.org/10.1016/j.jneb.2011.11.005>
- Wolfson, J. A., Leung, C. W., & Richardson, C. R. (2020). More frequent cooking at home is associated with higher Healthy Eating Index-2015 score. *Public Health Nutrition*, 23(13), 2384–2394. <https://doi.org/10.1017/S1368980019003549>
- Yoshinaga, A., Gray, V. B., Barrack, M., Blaine, R. E., & Smallwood, K. (2020). Team snacks in youth basketball: Which factors influence parent selection. *Family and Consumer Sciences Research Journal*, 48(3), 276–288. <https://doi.org/10.1111/fcsr.12353>

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Research Informed Guidelines for Couple and Relationship Education Programs with Arab American Immigrant Couples

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In this paper, we review the characteristics of Arab immigrants and propose guidelines for couple and relationship education (CRE) programs with Arab immigrant couples. Arab immigrants are a heterogeneous group, yet they share common cultural characteristics and family values that are essential to understand when working with them. Generally, CRE programs with immigrated Arabs should be mindful of (1) strongly valued religious beliefs, (2) extended family as a primary source of support and marital problem-solving, (3) the tendency to follow gender-based roles and responsibilities, and (4) Arabic language and communication norms. Family educators and practitioners who work with recently immigrated Arab couples should familiarize themselves with these characteristics to better serve them.

Keywords: Arab Americans, couple and relationship education, family life education, immigrant couples

Introduction

Couple relationship education (CRE) is becoming increasingly recognized as an effective, lower-cost, and less intensive alternative to counseling or therapy for couples seeking to strengthen and improve their relationship (Dion, 2005; Hawkins et al., 2008). CRE is not therapeutic but instead is a psychoeducational and preventive approach that helps promote couples' resilience, satisfaction, and effective communication (Ponzetti, 2016). The relationship concepts and skills are addressed through educational activities and dialogue. Family life educators who deliver CRE programs should have solid knowledge about their intended audience as well as the content they are teaching (Ballard & Taylor, 2013).

Ballard and Taylor (2013) identified key principles for best practices in Family Life Education (FLE) with diverse populations that can be applied to CRE. This model considers program content and program design, as well as educators' understanding of the culture, strengths, and needs of the target population (Ballard & Taylor, 2013). Research on the effectiveness of CRE programs suggests that marriage education programs can benefit couples and help them improve their communication and conflict resolution skills, enhance marital satisfaction and commitment to the spouse, and reduce the odds of divorce (Carroll & Doherty, 2003; Hawkins et al., 2008).

Unfortunately, much of the early program development, implementation, and evaluation research on CRE programs have largely focused on middle-class European American couples, particularly married heterosexual couples (Ballard & Taylor, 2013; Myers-Walls et al., 2011). This is problematic for practitioners who want to use evidence-based programs in CRE with more diverse populations because the foundations of these curricula may not apply in cross-cultural contexts, and how the programs are delivered may not be effective with diverse audiences (Ballard et al., 2016; Myers-Walls et al., 2011). Recognizing these problems, researchers studying CRE program effectiveness have made progress in identifying the needs of more diverse populations, tailoring and adapting CRE programs to meet the needs of particular groups, including, for example, remarried/stepcouples (Reck et al., 2020), low-income couples (Ooms & Wilson, 2004), Latinx couples (Skogrand et al., 2009), cohabiting couples (Rhoades et al., 2009), and Muslim Americans (Killawi et al., 2017). For example, Killawi and colleagues (2017) found that Muslim Americans tended to seek premarital education through lectures, workshops, and books but rarely sought professional counseling. In addition, premarital education through religious leaders was not perceived as helpful by Muslim American couples because such programs focused more on Islamic rights and responsibilities than on couple-based skills and knowledge (Killawi et al., 2013).

One population that has not received much attention is Arab immigrants. Although some prior work has examined family life education with Arab American Muslims (Blume et al., 2012) and other Muslims (Killow et al., 2017), scant attention has been paid to delivering culturally-sensitive CRE programs for Arab immigrant couples. There are approximately 3.7 million individuals of Arabic descent living in the United States (Arab American Institute [AAI], 2014). Although most of these (82%) individuals are U.S. citizens (AAI, 2014), many of them are recent immigrants who are in the first or second generation living in the United States. Recent waves of Arab immigrants are members of various religions, including Christianity, Druze, Judaism, and Islam (AAI, 2014; Naber, 2000). Most are legally-documented immigrants or relocated refugees (AAI, 2014).

The purpose of this paper is to provide guidelines for best practices in the design, recruitment, and implementation of CRE programs with Arab immigrants to the United States. The guidelines are based on studies of the cultural, social, and demographic characteristics of Arabs who have migrated to the United States and research on effective interventions with them. We review common trends and characteristics of Arab immigrants as an identifiable ethnic group and discuss the implications of these characteristics for implementing CRE with young Arab immigrant couples. Arabs' shared values and common language are the bases upon which educators can implement effective CRE programs with them. In this review, we focus on first- and second-generation Arab immigrants, defined as individuals who immigrated to the United States, either as adults or as children, from one of the 22 countries in which Arabic is the official language, an area extending from Northern and Western Africa to the Middle East (AAI, 2014). Finally, although we realize that CRE programs are generally offered to diverse audiences, we

think it is unlikely that Arab immigrant couples would avail themselves of general-public programs. In our view, Arab immigrants would be a specific target audience for CRE, just as stepcouples, Latinx couples, or other specific groups.

Key Features of Marriage and Family in Arab Cultures

Although Arab immigrants vary in terms of country of origin, religious affiliation and practice, skin color, socioeconomic status, and other demographic characteristics, four common characteristics have been identified in the literature for this group: (1) strong adherence to conservative religious faiths, (2) institutionalized functions for the extended family, (3) tendency towards traditional gender-based roles and responsibilities, and (4) Arabic language and communication norms. These characteristics overlap in the lived experience of Arab Americans, with religious beliefs influencing firmly held values about the importance of extended kin and gender roles, but we examine them separately in this review. Those cultural characteristics should not be generalized to all Arab immigrants, of course, as there is variability within this category of immigrants and new citizens.

Religious Beliefs

Arab immigrants are members of various religions, including Christianity, Druze, Judaism, and Islam (AAI, 2014; Naber, 2000). Most Arabs who have immigrated to the United States are Christians (63%), but there are substantive numbers of Arab Americans who are Muslims (24%), with 13% identified as belonging to other religious groups (AAI, 2014). Christian Arab Americans are mostly Roman Catholic, but some follow Chaldean and Orthodox traditions (Samhan, 2015). The majority of Muslim Arab Americans follow the Sunni sect, with a smaller percentage belonging to the Shia sect (Samhan, 2015).

Generally, Arab immigrants tend to be strong adherents to their faiths (Barry et al., 2000; Nassar-McMillan & Hakim-Larson, 2003) and hold conservative religious values about marriage and family (Al-Krenawi & Jackson, 2014). It is common to find Arab Christians holding traditional attitudes toward marriage and family that are similar to Arab Muslims (Abudabbeh, 2005). For example, for both faiths, marriage is considered an essential aspect of life that everyone should experience. Consequently, findings suggest that Arab Americans are more likely to marry and less likely to divorce than the general U.S. population (Brittingham & de la Cruz, 2005) and more likely to live in family households led by married couples (American Community Survey, 2013). Arab American households are slightly larger than the U.S. national average, perhaps because they are more likely to live with extended family members and to have more children than Americans in general (American Community Survey, 2013).

Marriage is seen as a contract between two families rather than between two individuals (Al-Krenawi & Jackson, 2014). However, this does not mean that individual spouses do not have a say in their marriages. For instance, among Muslims, each partner can premaritally state their

expectations for marriage, such as a woman stating that her husband will not prevent her from seeking employment (Al-Krenawi, 2014). For all religious groups of Arab Americans, marriage rituals include an engagement period, a religious ceremony, and a wedding reception (Al-Krenawi & Jackson, 2014). The engagement period is seen as the time for future spouses to become better acquainted and develop affection and love between the couple. It is also the time when both partners get to know extended family members, especially future in-laws. Premarital sexual intercourse is forbidden by all Arab American religious groups.

Arab immigrants tend to see religious practices such as praying and going to the mosque or church as ways of keeping couples and their extended family members closely connected. The religious foundations underlying getting married and having children also serve as ways by which extended families are brought together, and marriage and reproduction are seen by Arabs as important familial duties. Children are highly valued, and the religious beliefs of Arabs of all faiths support childrearing by married parents as a healthy environment for children (Zarean & Barzegar, 2016).

One subtle difference between Arab religions is that Catholic Arabs are taught that marriage is a sacred, unbreakable promise intended to be a life-long commitment and divorce a sin (Al-Krenawi, 2014), whereas Muslim Arabs consider divorce as a last resort solution to marital problems and is not prohibited (Zarean & Barzegar, 2016). Strictures against divorce in the Catholic faith have been found to impact Catholic Arab American couples' relationships because these spouses tend to tolerate more marital problems due to these religious prohibitions (Al-Krenawi, 2014).

Suggestions for CRE Practice

It is not necessary for CRE leaders to be experts in the faiths commonly represented in Arab immigrant communities. But they should be conversant with some of the basic tenets of these faiths, at least as those tenets are relevant to marriage and family issues. For instance, because Arab religions forbid premarital sex, explicit or implicate messages related to couples' sexual lives may be perceived by them as inappropriate, especially among audiences that include unmarried (engaged) couples.

Practitioners also should be aware of the variety of religious backgrounds of Arabs and avoid the misconception that all Arabs are Muslim. CRE leaders should also be aware that just as there are a variety of Christian faiths, such as Syrian Catholic, Chaldean Catholic, Roman Catholic, etc. (Abudabbeh, 2005), Muslims also are heterogeneous in their religious practices, such as Sunni and Shia sects (Alghafli et al., 2014). In all cases, showing respect for the importance of Arab individuals' religious values is essential in establishing rapport.

CRE programs for Arab immigrant couples should attempt to make meaningful connections between scientific-based information and commonly held religious beliefs regarding marital life

(Cho, 2018). For example, the concept of love is religiously and culturally determined, and the ways love is expressed to the wife or the husband might differ from Western cultures. Couples, especially women, may not feel comfortable expressing public displays of affection (PDA), and it is unacceptable socially before marriage (Al-Krenawi & Jackson, 2014; Erickson & Al-Timimi, 2001). Family professionals should be aware of this when facilitating the class and discussing such concepts.

Given that religious institutions have played a significant role in preparing couples for marriage and educating them about family issues, often through weekly meetings or daily prayers (Almalki & Ganong, 2018; Eldeeb, 2017), practitioners may find it helpful to seek local religious leaders' support during the recruitment process for CRE programs. Arab American couples tend to trust religious leaders, who often serve as mediators when couples have marital problems (Aloud, 2004). Al-Krenawi and Graham (2000) suggested that religious and community leaders could serve as moderators in helping individuals as they are more likely to know their experiences and acculturation levels. Therefore, the integration of the CRE program with the local religious centers could be useful in teaching couples about healthy families. Moreover, holding CRE classes in a church or mosque might be convenient for members of Arab communities, as these centers are often familiar places where community members socialize.

Importance of the Extended Family

The extended family system is highly valued in Arab culture, prioritized over nuclear families, and couples usually are thought of within that wider family context (Al Darmaki et al., 2016). Arab families are patrilineal, so couples are more closely involved with the husband's extended family following marriage than the wife's family (Joseph, 1994). However, all older kin are respected and valued, and younger kin have responsibilities to help aging parents (Dhami & Shikh, 2000). In fact, extended families represent interlocking ties of loyalty and obligations, which are accompanied by norms for expected behaviors and expectations for tangible and intangible support. Traditionally, extended kin networks have been critical in mate selection, couple and individual well-being, and marital adjustments. A successful marriage of one's children is believed to be a sign of good parenting (Haboush, 2007), so parents and in-laws of young married couples are often actively involved with them in multiple ways.

Mate Selection

Among Muslim Arab Americans, arranged marriages in which parents and other extended family members plan and approve marriages between two individuals who know each other very little, if at all, is still an observed practice, although younger generations tend to have more say about their future partners (Harkness & Khaled, 2014). Historically, marriages between first cousins who share a common ancestor also have been common in Arab-Muslim families (Harkness & Khaled, 2014). This type of marriage is believed to increase family bonding and cohesion (Radovanovic et al., 1999). Immigration reduces the likelihood that marriages are arranged

because long distances make it harder for kin to negotiate marriages, and extended family bonds are weakened somewhat by migrations. Perhaps because of this, increasing numbers of Arab immigrants seek partners from other ethnic groups (Kulczycki & Lobo, 2002), resulting in more heterogeneous marriages.

Even when marriages are not arranged by parents and other extended kin, however, there are expectations among Arab Muslims that permission to marry must be granted by a guardian, usually the woman's father (Al-Krenawi & Jackson, 2014). Among Arab Christians, couples are expected to obtain their parents' and families' approval before marrying. For all Arabs, parents' approval of the marriage is believed to contribute to healthy family functioning in the future.

Support and Advice

Immigrating is challenging for many reasons, but for Arabs immigrating may be particularly stressful if they are not accompanied by extended family members and older kin (Alhasanat-Khalil et al., 2017). Similarly, Latinx immigrant couples are more likely to deal with immigration demands such as emotional losses, not feeling at home, missing family in their home countries, as well as other cultural and occupational challenges (Falconier et al., 2013). A positive association was found between acculturative stress and decreased relationship satisfaction among Latinx immigrant couples (Negy et al., 2010). Research evidence suggests that immigrant couples miss their families and experience feelings of loss, and therefore the support they receive from their partners is associated with more marital satisfaction (Falconier et al., 2013). Among Arab couples, research suggests that older kins' advice about marriage and childrearing is appreciated by younger family members and having extended family members live nearby is seen as a benefit for marital relationships (Al Darmaki et al., 2016). Research on other ethnic groups of immigrants also suggests that living far from extended kin networks is negatively associated with learning skills related to parenting, communication, and conflict resolution (Bryant et al., 2008; Wheeler et al., 2010). If Arabs lose access to extended kin as a source of social and emotional support, immigrant spouses become more important sources of support for each other, putting greater stress on their marriages (Aroian et al., 2010). The loss of extended kin social support also affects individual well-being. For example, lack of social support and greater stress were predictors of postpartum depression in Arab immigrant women in the United States (Alhasanat-Khalil et al., 2017). Different from European couples, it is not the tradition for Arab couples to rely solely on their spouses for support, but rather they rely on extended family members (Aloud & Rathur, 2009). Research findings suggest extended family is the most important social support unit for Arab American couples (Al-Krenawi, 2014; Killawi et al., 2017).

Although immigrant couples experience a decrease in social support from extended family members who stay in their country of origin, the extended family remains the primary source of support and strength for many Arab Americans (Al-Krenawi, 2014; Al-Krenawi & Jackson,

2014). This support includes tangible resources as well as emotional support - in Arab cultures, families are considered the primary providers of financial help and accommodation for newlyweds if needed (Abu Baker, 2003).

Solving Problems in the Extended Family

Extended family members are typically highly involved in solving couples' marital problems (Abu Baker, 2003). Commonly, female relatives play significant roles in providing emotional support for an upset wife and providing her with marital advice (Abu Baker, 2003). Sometimes couples are advised to take a break or temporary separation from each other, during which each partner returns to their family of origin to reflect on their problems for a period ranging from several days to months (Abu Baker, 2003). The wife's male relatives then discuss the marital problems with the husband. In this stage, the upset wife can demand the husband change certain behaviors that she believes contributed to marital problems (Abu Baker, 2003). Kinship connections between the families of the husband and the wife usually keep couples together, even if the root of marital problems remains unresolved. Although the involvement of the extended family is seen as mostly positive, relationships with extended kin can escalate a couple's marital problems instead of providing support (Abu Baker, 2003). Thus, some couples may refuse to accept the involvement of the extended family in their lives and decisions because of possible negative consequences, such as enduring marital conflict for the sake of preserving the marriage (Abu Baker, 2003, 2006).

Because of the longstanding cultural tradition of managing marital and family issues privately within the family, Arab Americans tend to engage in limited help-seeking behaviors in the mental health setting (Martin, 2014; Nassar-McMillan & Hakim-Larson, 2003). Engaging a professional in marital problem-solving is stigmatized, viewed as an indication of the family's failure to resolve the problem on their own (Al-Krenawi et al., 2004; Al-Krenawi & Graham, 2000). Individuals may even avoid acknowledging the existence of a relationship or mental health issues in the family to prevent bringing shame to the family by exposing the couple's private problems or potential mental health issues to a non-family member (Timraz et al., 2017; Youssef & Deane, 2006). In a study examining the behavior of help-seeking among different ethnic groups, Arab American clients tended to quit counseling because of their discomfort in the therapeutic setting (Martin, 2014).

Suggestions For CRE Practice

The importance of the extended family has several implications for CRE with Arab American immigrants. Educators can utilize this information in recruiting, structuring the group setting, and in the context of CRE programs.

Recruiting. Educators also may want to consider when recruiting that couples could be encouraged to bring along their parents or in-laws, especially mothers-in-law. Broadening the

lens of CRE to include parents and other older kin may make the program seem safer, more culturally congruent, and could help demystify what might be done in the CRE program. Involving extended family members in the recruitment process can be helpful. Thus, for educators, recruiting participants for the CRE classes should take into consideration the help of the extended family and draw their attention to the significance of the CRE classes in promoting healthy relationships. Building trust between the educators and the family is important because the family may still have an influence on the couple's life. For couples, extended family can provide additional support, such as childcare support, which may influence the couple's decision to attend the CRE classes.

Knowing that Arab immigrants will be reluctant to seek outside help may be useful in recruiting. Educators should not expect to make some announcements about their CRE program, send out emails or post flyers, and get many couples to respond. Recruiting will need to be proactive and yet sensitive to couples' potential reluctance to participate. As noted earlier, enlisting the help of religious leaders in promoting the program may help, as would asking other respected community leaders to vouch for the usefulness of the program and the wisdom and integrity of the educators leading the program.

The language/wording used to promote the CRE offering may be important as well. Stressing confidentiality in what transpires would be an important value, as would emphasizing that CRE is for everyone and not just for couples with marital problems or issues to resolve. Young individuals do not want their actions to reflect poorly on their parents' childrearing, so normalizing the need for opportunities to enrich already positive couple bonds may help alleviate these concerns.

It is important to make sure that advertising and recruitment efforts effectively communicate the goals of the CRE program, topics that will be covered, and what participants can expect to achieve by the end of the program. Couples may be more open to the idea of group-based relationship education if they understand that they will not be required to disclose anything that makes them uncomfortable.

Format of CRE Programs. Including other family members as well as couples in program formats also may be beneficial. Some research findings suggest the presence of extended families in an intervention can improve their interpersonal skills within family relationships and help to prevent future marital problems (Abu Baker, 2003). Family involvement in an intervention delivered in a social work setting was found to help social workers address problems more quickly and to discuss the problems from different perspectives (Al-Krenawi & Graham, 2000). The involvement of the extended family can be an option but should not be required, as for some, it can complicate and escalate couple conflict.

CRE facilitators, aware that Arab immigrants may be reluctant to make public disclosures about their marriages, may consider structuring classes in ways that minimize activities in which

participants are asked to openly share issues of concern, problems, or even positive things about their marriages. Instead, having the educator/leader share information with the group may be more comfortable for Arab participants. Providing ways of privately or anonymously asking questions or providing input should be planned into CRE formats with Arab couples as well. CRE program as a group setting can help them benefit from interacting with other participants in these settings and helping them realize their problems are not unique to them. Realizing that other couples experience similar issues can help them disclose more and become more engaged. With assistance from the CRE facilitator, this can help them learn about their needs and practice new skills in a safe environment, surrounded by other couples who may share related experiences. One way of overcoming the publicity issue is by engaging a CRE facilitator who speaks Arabic and English and has a shared cultural background with the participants. Building a rapport by approaching each couple separately prior to the class and explaining the purpose of the CRE classes in a non-judgmental manner might encourage more participation.

CRE Content. Early on, leaders should be clear that CRE is not about blaming anyone or finding deficits to correct or otherwise stigmatize individuals or their families. Normalizing CRE as a value-added experience for well-functioning couples is also a message that should be included not only in recruiting but repeatedly throughout the program. Perhaps because Arab culture is highly hierarchal, participants prefer an instructional-explanatory model for CRE content. Individuals from this population usually have high expectations for educators and their ability to explain conditions and supply information concerning the issues. They may prefer to remain passive during the sessions as they expect the class leaders to explain the content and provide direct and clear instructions for any class discussions.

Educators should also recognize feelings that may exist regarding extended kin being far away and what the loss of readily available support from them might mean to young Arab immigrant couples. Educators also should recognize that couples may feel as if they are representing their families and that their participation in CRE may be an indication that they are letting their extended kin network down in some way. Proactively addressing these potential feelings about extended kin may help participants be more receptive to program content. Parents and other kin who are in attendance also need to hear these normalizing comments and be made to feel as if they are valuable partners in helping the young couple benefit from CRE.

Finally, educators should not assume that couple relationships originated from romantic love between two partners or that participants were likely to have dated prior to marriage. Educators may want to be flexible in including content about premarital bonding, as the experiences of Arab immigrant couples are likely to be varied.

Clearly Defined Gender Roles

Although there are considerable variations within Arab communities regarding women, gender, and patriarchy, numerous studies pointed out that distinct gender roles and responsibilities are

important to Arab immigrants (Al-Krenawi & Graham, 1999; Al-Krenawi & Jackson, 2014). Compared to men, women are expected to be obedient and pay greater attention to the home, domestic duties, childrearing, and providing emotional support for their families (Abu Baker, 2003; Al Darmaki et al., 2016). Males are expected to be the primary financial providers and the authority figures in the family (Abu Baker, 2003). When women work outside the home for wages, most accept the authority of their husbands at home, but they express their ideas and contribute to decision-making (Al-Krenawi, 2005).

When marital disagreements arise, Arab women may face cultural pressure to be primarily responsible for reducing conflicts and maintaining a peaceful and stable household environment (Abu Baker, 2003; Al Darmaki et al., 2016). If they cannot solve whatever marital problems arise, even with the aid of extended kin and perhaps their husbands' cooperation, Arab women often try to endure rather than seek outside help or file for divorce (Al-Krenawi & Jackson, 2014; Haboush, 2007). However, some findings suggest the acculturation process may have challenged these cultural norms, and the education and assimilation that occur during the acculturation process have helped women become more assertive in seeking professional help (Al-Krenawi, 2005). For some women, particularly religious ones, divorce may be seen as a sign of failure and the woman's failed responsibility of keeping the family together (Abu-Ras, 2007; Al-Krenawi & Jackson, 2014). Also, in many countries from which these Arab immigrants originated, fathers retain physical and legal custody of children after divorce (Abu Baker, 2003; Abu-Ras, 2007; Haboush, 2007), so some women may be reluctant to risk losing their children in U.S. courts if they seek divorce.

Gender role expectations outside of the home are relevant as well. Informed by religious beliefs and observed more often among Muslims (Read, 2002, 2003), gender segregation outside the home might be a characteristic of Arab culture generally, but research evidence suggests that it is less common among acculturated families (Ajrouch, 2004). This means that Arab women, especially those of the Muslim faith, may prefer interacting only with women outside the family household, and men prefer interacting only with men. For instance, Muslim Arabs prefer working with teachers, physicians, and other practitioners of the same sex (Haboush, 2007). This gender segregation clearly affects women's employment outside of the family household. Among Arab American women from different Muslim and Christian backgrounds, cultural expectations regarding women's roles as housewives were identified as a key barrier to paid employment (Read, 2004a; Read & Oselin, 2008). Studies show that first generation Arab immigrant women have lower rates of employment compared to other first generation ethnic groups, such as Latinx (Read, 2003, 2004b).

As with other ethnic immigrant groups, successive generations who have become more socialized into American cultural values are less likely to adhere as closely to these strict gender role norms. For instance, Arab American women who grew up in secular households and who were second or third generation immigrants were less likely to follow traditional gender roles,

had greater influence on household incomes, and contributed to household decision-making (Aswad, 1994; Read & Bartkowski, 2000).

Suggestions for CRE Practice

Family practitioners and educators who work with the Arab immigrant population need to be aware of the variation that exists in gender dynamics and its relation to individual differences in acculturation experiences. Arab immigrants who have spent more time in the United States may be more acculturated and may not follow traditional gender roles, although some may. It is critical to consider the level of acculturation of the target group. For example, those who recently came to the United States may be more attached to cultural beliefs regarding bans against mixed-gendered socializing. So they may not be willing to attend a mixed-gendered CRE program. Even if couples are willing to attend a CRE program in which both men and women are in the same setting, it might be more acceptable, and participants may be made more comfortable by creating some distance between couples to increase their privacy during class activities and discussions. Arab women may face more pressure against attending CRE mixed-gender classes, and some women may not be able to attend if their husbands are not willing or able to attend with them. Implementing gender-segregated classes may be helpful in Arab communities holding strong preferences against mixed-gender meetings. If same-gender classes or programs are necessary for people to attend in comfort, then facilitators should provide take-home activities so that individuals can engage with their partners at home. CRE leaders might also consider using paired male-female educators if there will be cross-gendered classes. Not only does this allow for some modeling of couple behaviors, but it raises the possibility of spending some time during the class in male-only and female-only groups.

CFLEs need to be aware that the changes in the husband roles and wife roles and the backlash between the Western values and the Arab world values is one the areas of marital disagreement in the Arab family household (Al-Krenawi, 2005). Certain topics, such as sexuality in marriage, are more likely to be accepted in gender-segregated classes with educators who are of the same gender as the participants. For example, women in abusive marriages may be reluctant to seek help (Abu-Ras, 2007), but CRE programs may be appropriate channels to raise awareness about family violence and provide information for seeking further help in local community centers.

Communication with Arab Immigrants

In addition to understanding Arab immigrants' religious beliefs, the importance of extended family, and their enactments of distinct gender roles, CRE program leaders should be aware of another important cultural characteristic – Arabic language and communication norms.

Arabic Language

Arabic is the official language of 22 countries from northwest Africa to the Middle East. This language is one of the main ethnic characteristics that define Arab Americans and distinguish them from other ethnic groups. Although spoken Arabic dialects (Fusha) are slightly different from one country to the next (e.g., Egyptians speak an Egyptian-Arabic dialect different from Gulf-States Arabic), formal Arabic Fusha, either spoken or written, is widely used and understood by all Arabs, regardless of homeland. Because there are differences between the spoken local dialects and formal written Arabic, however, it is recommended that educators consider using interpreters when teaching classes for limited English-speaking participants (Blume et al., 2012).

Communication by Arab immigrants and Arab Americans has been described as indirect, emotional, and ambiguous (Al-Krenawi, 1998; Hall, 1976). For example, the meaning of spoken words is often embedded in the situation or the relationship between individuals, such as in a counseling or therapy session, when Arab clients may use idioms such as “a dark life” or “my heart fell down” to describe feeling depressed (Al-Krenawi & Graham, 2000). In conversations and writing styles, ambiguous communication can take different directions and jump back and forth, leaving some details relying on the listener’s ability to get the meaning from the context (Hall, 1976). Repetition and elaboration are also common features used by Arabic speakers (Feghali, 1997). Repetition is useful to emphasize certain points, explaining or describing something (Nelson et al., 2002). Finally, the use of words such as “Inshallah,” which means “God Willing,” is frequent and indicates to others that the speaker believes that God has total control of the future (Al-Krenawi & Graham, 2000; Feghali, 1997).

Non-Verbal Communication

Nonverbal communication in Arab cultural contexts can be characterized by indirect eye contact in certain contexts, expressive body language, closeness between individuals, and relaxed attitudes toward time (Feghali, 1997). Lowering one’s gaze during face-to-face interactions with the opposite sex or between children and an older adult is considered polite (Feghali, 1997). Silence, which may be used to show support, disagreement, or anger, can also mean showing respect to authority figures such as older kin and teachers.

It is common for pairs of men or pairs of women to walk hand in hand or to hook arms when walking (Feghali, 1997). Greetings of individuals of the same gender may involve handshakes and cheek kisses depending on the closeness of the relationship (Feghali, 1997; Hall, 1976). It is customary for Arabs to greet or say goodbye to everyone present when entering or exiting a room, meeting, or gathering. Speaking fast and loudly is also common for Arabic natives. In Arab culture, people stand close to each other and tend to touch frequently with the same gender (Hall, 1976). The approach to time is relaxed; in social interactions, Arabs focus on relationships rather than following a specific schedule (Feghali, 1997).

Suggestions for CRE Practice

Effective communication is necessary for any educator in any setting to meet program goals. Marketing and recruitment of CRE with Arab Americans, as with any population, is key for successful program implementation. Research with Arab Americans and Arab immigrants highlights effective methods used for recruitment, such as identifying community leaders who speak the Arabic language and letting them help by connecting family life educators with the community (Blume et al., 2012). Flyers and brochures, as well as personal visits, can be used for practicality. If using flyers for recruiting Arab immigrants, bilingual flyers (after ensuring the translation to Arabic is correct) should be used, indicating (a) the purpose of the class, (b) the target audience, (c) general goals, (d) time and location of the classes, and (e) contact information of the bilingual person in charge of recruitment. Written communication may be more helpful in recruiting as this group tends to carry written documents with them for appointments. In terms of retention, which can be a challenge (Al-Krenawi & Graham, 2000), facilitators should remind participants at the end of each session about the time of upcoming sessions and any homework or expectations that participants should bring to the next session. There is evidence that calling or texting participants can be more effective than emails (Al-Krenawi & Graham, 2000; Timraz et al., 2017).

If CRE program participants have limited English fluency, programs should be implemented in Arabic if possible. This means that recruiters, educators, and anyone else who has direct contact with participants, should be fluent in Arabic. Alternatively, using interpreters for a limited-English audience works when having a native Arabic-speaking facilitator is not possible (Blume et al., 2012).

Even for participants who display a good command of English, CRE program leaders are advised to preview key terms at the start of the session with participants and to provide handouts that explain important concepts that will be discussed. During the session, it is important to build in repetition and frequent summaries since repetition is one of the important features of the Arabic communication style (Hall, 1976). Using teaching aids such as PowerPoint, relevant pictures, and videos also may enhance learning by providing repeated messages in different formats. Sarcasm and humor should be avoided, as these can be misunderstood by newcomers to English. If practitioners use humor, they should inform Arab audiences that they mean to be funny and then explain what the humorous comment means and how it relates to the subject being presented (Al-Krenawi & Graham, 2000).

The role of the facilitator in preparing Arab immigrants for a session includes tone of voice, gesture, space, and welcoming participants. For example, individuals may greet others of the same gender with a kiss on the cheek, or they may shake hands at the beginning and the end of each class. CRE program facilitators, however, do not have to kiss or shake hands unless it is initiated by the participant. It is expected that the facilitator will greet participants before starting

the session. During classes, when asking everybody to introduce themselves to the class, it is common for any of the participants' parents in attendance to have nicknames. For example, a mother who has a son named Ahmed may prefer to be called "Ahmed's mother" rather than by her first name. The facilitator should encourage everyone to participate.

Finally, facilitators should clarify their roles and the ways in which they can help at the beginning of the sessions. Arabs tend to trust professional helpers (Al-Krenawi & Graham, 2000). This trust may create high expectations by participants that the program facilitators will provide an ultimate solution for their marital problems, so educators should be prepared to suggest resources for couples wanting therapy or counseling.

When teaching Arab immigrants, educators should consider using discussions and dialogue, which may be more effective than lecturing. Storytelling is one of the effective modes of learning rooted in Arabic cultures (Blume et al., 2012). Repetition of important content is helpful. Finally, leaders should be flexible about starting times, if possible. If sticking to a schedule is important, then this needs to be communicated to Arab immigrant participants and framed as a favor that the educator is asking of them. Perhaps allowing time for informal socializing among participants at the start of sessions (and building this time into the lesson plan) would be a good way to balance different orientations to time and scheduling.

Conclusions

Couples and relationship education programs are designed to address relationship issues for couples who are in committed relationships (Halford, 2004). Family scholars have noted one of the challenges in teaching CRE programs is to be inclusive of all families, using teaching strategies that meet the needs of culturally diverse couples (Ballard & Taylor, 2013). Although empirical evidence on cultural adaptation in couples' education, specifically with Arab Americans and Arab immigrants, is lacking, there have been some efforts to discuss general FLE programs for Arab Americans (e.g., Blume et al., 2012).

Please refer to Table 1 for an overview of the Guidelines for CRE Programs with Arab immigrants.

Table 1. Guidelines for CRE Programs with Arab Immigrant Couples

Characteristics of Arab Cultures	Key Application to CRE Programming	Key Methods
Religious Values	<ul style="list-style-type: none"> Not all Arabs are Muslims, and not all Muslims are Arabs. At least (63%) of Arab Americans are Christians. Strong adherence to conservative religious beliefs specifically related to the importance of marriage and family formation. Religious-based services are common ways to seek premarital education Understand how religious beliefs may affect marriages and mate selection. For example, it is not common for couples to be dating before marriage. 	<p>Content: Avoid content related to explicit or implicit messages related to couples' sexual lives, as it may be perceived as inappropriate.</p> <p>Design: Religious facility can be used as the location for CRE classes.</p> <p>Family life educator: Use the assistance of religious leaders when recruiting for CRE classes.</p>
Importance of the Family	<ul style="list-style-type: none"> Understanding the significant role of the family in individuals' lives. Extended family members are typically highly involved in solving couples' marital problems. Kinship connections between the families of the husband and the wife usually keep couples together. Family is the most important social support unit for Arab American couples. Arabs might be reluctant to seek outside help. 	<p>Content: Incorporate class discussions and scenarios that involve family roles in couples' lives.</p> <p>Design: Provide the CRE program in the context of the family and extended family should be optional.</p> <p>Family life educator: Consider approaching parents and in-laws and building trust with them first when recruiting for CRE classes will more likely encourage more participation.</p>
Gender Roles	<ul style="list-style-type: none"> Gender roles and responsibilities are clearly defined and sometimes supported by their religious beliefs. Gender segregation outside the home is less common among acculturated families. Wives may feel more responsible for reducing conflicts and maintaining a peaceful and stable household environment. Arab women often try to endure rather than seek outside help when marital issues arise. 	<p>Content: The backlash between the Western and the Arab world values regarding gender roles is one of the areas of marital disagreement in Arab households</p> <p>Design: Gender-segregated classes might be more acceptable for recently immigrated Arabs.</p> <p>Family life educator: Co-facilitating CRE program (male and female) may be more effective if presenting mixed-gender classes.</p>
Arabic Language and Communication	<ul style="list-style-type: none"> Arabic language is the unified feature of Arab Americans' ethnic identity. Repetition and elaboration are common features used by Arabic speakers Non-verbal communication includes expressive body language, closeness between individuals, and relaxed attitudes toward time. Storytelling can be an effective method of class facilitation. Greetings of individuals of the same gender may involve handshakes and cheek kisses. 	<p>Content: If CRE program participants have limited English fluency, CRE programs should be implemented in Arabic.</p> <p>Design: Preference of an instructional-explanatory model is the best to use for CRE class structure.</p> <p>Family life educator: leaders should be flexible about starting times if possible. If sticking to a schedule is important, then this needs to be communicated.</p>

In this paper, we reviewed common characteristics of Arab immigrant couples, drawing implications for CRE program adaptations for such couples. Drawing on the major principles of best practices in intervention and counseling with Arab Americans, we discussed the core cultural values of this group and proposed a set of guidelines for CRE program implementation that addresses the needs of the Arab immigrant community. The significant roles of religion, the importance of the family, clearly defined gender roles and responsibilities, and Arabic language and communication norms shape the implementation of CRE programs for these couples. Our analysis emphasizes the significance of religious values and the importance of religious leaders in assisting with personal and marital problems (Al-Krenawi & Graham, 2007; Aloud, 2004). Parents also have strong influences on individuals' marriage and divorce decisions. Given that Arab immigrant families may associate seeking professional help with failure (Aloud & Rathur, 2009), educators should make efforts to clarify any misconceptions about the goals of CRE programs. Stigma about seeking professional help and a preference for relying on family and kinship as the main pathway for social support are some factors impacting seeking professional help (Al-Krenawi, 2014; Al-Krenawi & Jackson, 2014) and may contribute to the underutilization of professional help by this group. The lack of professionals who have an understanding of Arab immigrants' cultures can influence the utility and experience of the CRE program (Killawi et al., 2017). Thus, we recommend that FLE professionals consider these factors when working with Arab immigrants.

We want to note that cultural humility is also an important concept for CRE leaders to bear in mind. Cultural humility is the idea that no single leader, even if well-versed in a cultural context or a member of the culture, will be able to know everything about the culture. Instead, to be effective, leaders should be open to learning new things from their program participants and expect and welcome the diversity of participants they will encounter. Cultural humility should be an educator's goal, as well as to hold some degree of cultural competence with the groups they are leading.

To achieve desired outcomes, the implementation of CRE programs with Arab immigrants should consider the four cultural characteristics identified in this paper. CRE programs can empower Arab immigrants to navigate their couple relationships effectively by teaching them healthy marriage skills and improving communication. We hope this review contributes to further study of immigrant families and to investigations exploring ways of providing more inclusive and strength-based perspectives in couple and family life education.

This paper is a first step in providing culturally competent CRE to Arab immigrants. There is much to be done to improve CRE with this group. For instance, scholars may conduct content analyses of CRE programs to determine content that is relevant for Arab immigrant couples. Interviews with Arab couples who participated in CRE might also give additional insight into their programming needs, and interviewing couples reluctant to participate may also provide

useful information about scheduling, recruiting, and communicating with them. Arab immigrants will continue to migrate to the United States, and family life educators should be prepared to help them learn couples' skills.

References

- Abu Baker, K. (2003). Marital problems among Arab families: Between cultural and family therapy interventions. *Arab Studies Quarterly*, 25(4), 53–74.
<https://www.jstor.org/stable/41858462>
- Abu-Baker, K. (2006). Family therapy with Arab/Muslim women. In M. Dwairy (Ed.), *Counseling and psychotherapy with Arabs and Muslims: A culturally sensitive approach* (pp. 120–137). Teachers College.
- Abudabbeh, N. (2005). Arab families: An overview. In M. McGoldrick, J. Giordano, & N. Garcia-Preto (Eds.), *Ethnicity and family therapy* (pp. 423–436). The Guilford Press.
- Abu-Ras, W. (2007). Cultural beliefs and service utilization by battered Arab immigrant women. *Violence Against Women*, 13(10), 1002–1028.
<https://doi.org/10.1177/1077801207306019>
- Ajrouch, K. J. (2004). Gender, race, and symbolic boundaries: Contested spaces of identity among Arab American adolescents. *Sociological Perspectives*, 47(4), 371–391.
<https://doi.org/10.1525/sop.2004.47.4.371>
- Al Darmaki, F. R., Hassane, S. H., Ahammed, S., Abdullah, A. S., Yaaqeib, S. I., & Dodeen, H. (2016). Marital satisfaction in the United Arab Emirates. *Journal of Family Issues*, 37(12), 1703–1729. <https://doi.org/10.1177/0192513X14547418>
- Alhasanat-Khalil, D., Fry-McComish, J., & Yarandi, H. (2017). Risk for postpartum depression among immigrant Arab women in the United States: A feasibility study. *Journal of Midwifery & Women's Health*, 62(4), 470–476. <https://doi.org/10.1111/jmwh.12617>
- Alghafli, Z., Hatch, T., & Marks, L. (2014). Religion and relationships in Muslim families: A qualitative examination of devout married Muslim couples. *Religions*, 5(3), 814–833.
<https://doi.org/10.3390/rel5030814>
- Al-Krenawi, A. (1998). Social workers practicing in their non-western home communities: Overcoming conflict between professional and cultural values. *Families in Society*, 80(5), 488–495. <https://doi.org/10.1606/1044-3894.1478>
- Al-Krenawi, A. (2005). Mental health practice in Arab countries. *Current Opinion in Psychiatry*, 18(5), 560–564. <https://doi.org/10.1097/01.yco.0000179498.46182.8b>
- Al-Krenawi, A. (2014). *Psychosocial impact of polygamy in the Middle East*. Springer.
- Al-Krenawi, A., & Graham, J. R. (1999). Social work and Koranic mental health healers. *International Social Work*, 42(1), 53–65. <https://doi.org/10.1177/002087289904200106>
- Al-Krenawi, A., & Graham, J. R. (2000). Culturally sensitive social work practice with Arab clients in mental health settings. *Health & Social Work*, 25(1), 9–22.
<https://doi.org/10.1093/hsw/25.1.9>

- Al-Krenawi, A., Graham, J. R., Dean, Y. Z., & Eltaiba, N. (2004). Cross-national study of attitudes towards seeking professional help: Jordan, United Arab Emirates (UAE) and Arabs in Israel. *International Journal of Social Psychiatry*, 50(2), 102–114.
<https://doi.org/10.1177/0020764004040957>
- Al-Krenawi, A., & Jackson, S. O. (2014). Arab American marriage: Culture, tradition, religion, and the social worker. *Journal of Human Behavior in the Social Environment*, 24(2), 115–137. <https://doi.org/10.1080/10911359.2014.848679>
- Almalki, S., & Ganong, L. (2018). Family life education in Saudi Arabia. In M. Robila & A. Taylor (Eds.), *Global perspectives on family life education* (pp. 381–396). Springer International Publishing.
- Aloud, N. (2004). *Factors affecting attitudes toward seeking and using formal mental health and psychological services among Arab-Muslims population* (Publication No. 3124971) [Doctoral dissertation, Ohio State University]. ProQuest Information and Learning Company.
- Aloud, N., & Rathur, A. (2009). Factors affecting attitudes toward seeking and using formal mental health and psychological services among Arab Muslim populations. *Journal of Muslim Mental Health*, 4(2), 79–103. <https://doi.org/10.1080/15564900802487675>
- American Community Survey. (2013). Arab households in the United States: 2006-2010 report (ACSBR 10/20). <https://www2.census.gov/library/publications/2013/acs/acsbr10-20.pdf>
- Arab American Institute. (2014). *Arab Americans: Demographics*.
<https://www.aaiusa.org/demographics>
- Aroian, K., Templin, T. N., & Ramaswamy, V. (2010). Adaptation and psychometric evaluation of the multidimensional scale of perceived social support for Arab immigrant women. *Health Care for Women International*, 31(2), 153–169.
<https://doi.org/10.1080/07399330903052145>
- Aswad, B. (1994). Attitudes of immigrant women and men in the Dearborn area toward women's employment and welfare. In Y. Haddad & I. Smith (Eds.), *Muslim communities in North America* (pp. 28–47). State University of New York Press.
- Ballard, S. M., & Taylor, A. C. (2013). *Family life education with diverse populations*. SAGE Publications.
- Ballard, S., Tyndall, L., Baugh, E., Bergeson, C., & Littlewood, K. (2016). Framework for best practices in family life education: A case example. *Family Relations*, 65(3), 393–406.
<https://doi.org/10.1111/fare.12200>
- Barry, D., Elliott, R., & Evans, E. M. (2000). Foreigners in a strange land: Self-construal and ethnic identity in male Arabic immigrants. *Journal of Immigrant Health*, 2, 133–144.
<https://doi.org/10.1023/A:1009508919598>
- Blume, L., Sani, A., & Ads, M. (2012). Family life education with Arab immigrant families. In S. M. Ballard & A. C. Taylor (Eds.), *Family life education with diverse populations* (pp. 211–230). SAGE Publications.

- Brittingham, A., & de la Cruz, P. (2005). *We the people of Arab ancestry in the United States* (Special Report, CENSR-21). U.S. Census Bureau.
<https://www.census.gov/library/publications/2005/dec/censr-21.html>
- Bryant, C. M., Taylor, R. J., Lincoln, K. D., Chatters, L. M., & Jackson, J. S. (2008). Marital satisfaction among African Americans and Black Caribbeans: Findings from the National Survey of American Life. *Family Relations*, 57(2), 239–253.
<https://doi.org/10.1111/j.1741-3729.2008.00497.x>
- Carroll, J. S., & Doherty, W. J. (2003). Evaluating the effectiveness of premarital prevention programs: A meta-analytic review of outcome research. *Family Relations*, 52(2), 105–118. <https://doi.org/10.1111/j.1741-3729.2003.00105.x>
- Dhami, S., & Sheikh, A. (2000). The Muslim family: Predicament and promise. *The Western Journal of Medicine*, 173(5), 352–356. <https://doi.org/10.1136/ewjm.173.5.352>
- Dion, M. R. (2005). Healthy marriage programs: Learning what works. *The Future of Children*, 15(2), 139–156. <https://doi.org/10.1353/foc.2005.0016>
- Eldeeb, S. Y. (2017). Understanding and addressing Arab-American mental health disparities. *Scholarly Undergraduate Research Journal at Clark*, 3(1), Article 1.
<https://commons.clarku.edu/surj/vol3/iss1/1>
- Erickson, C. D., & Al-Timimi, N. R. (2001). Providing mental health services to Arab Americans: Recommendations and considerations. *Cultural Diversity & Ethnic Minority Psychology*, 7(4), 308–327. <https://doi.org/10.1037/1099-9809.7.4.308>
- Falconier, M. K., Nussbeck, F. W., & Bodenmann, G. (2013). Immigration stress and relationship satisfaction in Latino couples: The role of dyadic coping. *Journal of Social and Clinical Psychology*, 32(8), 813–843. <https://doi.org/10.1521/jscp.2013.32.8.813>
- Feghali, E. (1997). Arab cultural communication patterns. *International Journal of Intercultural Relations*, 21(3), 345–378. [https://doi.org/10.1016/S0147-1767\(97\)00005-9](https://doi.org/10.1016/S0147-1767(97)00005-9)
- Haboush, K. L. (2007). Working with Arab American families: Culturally competent practice for school psychologists. *Psychology in the Schools*, 44(2), 183–198.
<https://doi.org/10.1002/pits.20215>
- Halford, W. K. (2004). The future of couple relationship education: Suggestions on how it can make a difference. *Family Relations*, 53(5), 559–566. <https://doi.org/10.1111/j.0197-6664.2004.00065.x>
- Hall, T. (1976). *Beyond culture*. Doubleday.
- Harkness, G., & Khaled, R. (2014). Modern traditionalism: Consanguineous marriage in Qatar. *Journal of Marriage and Family*, 76(3), 587–603. <https://doi.org/10.1111/jomf.12106>
- Hawkins, A. J., Blanchard, V. L., Baldwin, S. A., & Fawcett, E. B. (2008). Does marriage and relationship education work? A meta-analytic study. *Journal of Consulting & Clinical Psychology*, 76(5), 723–734. <https://doi.org/10.1037/a0012584>
- Joseph, S. (1994). Gender and family in the Arab world. In S. Sabbagh (Ed.), *Arab women: Between defiance and restraint* (pp.194–202). Olive Branch Press.

- Killawi, A., Fathi, E., Dadras, I., Daneshpour, M., Elmi, A., & Altalib, H. (2017). Perceptions and Experiences of Marriage Preparation Among U.S. Muslims: Multiple Voices from the Community. *Journal of Marital and Family Therapy*, 44(1), 90–106.
<https://doi.org/10.1111/jmft.12233>
- Kulczycki, A., & Lobo, A. P. (2002). Patterns, determinants, and implications of intermarriage among Arab Americans. *Journal of Marriage and Family*, 64(1), 202–210.
<https://doi.org/10.1111/j.1741-3737.2002.00202.x>
- Martin, U. (2014). Psychotherapy with Arab Americans: An exploration of therapy-seeking and termination behaviors. *International Journal of Culture and Mental Health*, 7(2), 162–167. <https://doi.org/10.1080/17542863.2012.742121>
- Myers-Walls, J. A., Ballard, S. M., Darling, C. A., & Myers-Bowman, K. S. (2011). Reconceptualizing the domain and boundaries of family life education. *Family Relations*, 60(4), 357–372. <https://doi.org/10.1111/j.1741-3729.2011.00659.x>
- Naber, N. (2000). Ambiguous insiders: An investigation of Arab American invisibility. *Ethnic And Racial Studies*, 23(1), 37–61, <https://doi.org/10.1080/014198700329123>
- Nassar-McMillan, S. C., & Hakim-Larson, J. (2003). Counseling considerations among Arab Americans. *Journal of Counseling & Development*, 81(2), 150–159.
<https://doi.org/10.1002/j.1556-6678.2003.tb00236.x>
- Negy, C., Hammons, M. E., Reig-Ferrer, A., & Carper, T. M. (2010). The importance of addressing acculturative stress in marital therapy with Hispanic immigrant women. *International Journal of Clinical and Health Psychology*, 10(1), 5–21.
- Nelson, G. L., Al Batal, M., & El Bakary, W. (2002). Directness vs. indirectness: Egyptian Arabic and U.S. English communication style. *International Journal of Intercultural Relations*, 26(1), 39–57. [https://doi.org/10.1016/S0147-1767\(01\)00037-2](https://doi.org/10.1016/S0147-1767(01)00037-2)
- Ooms, T., & Wilson, P. (2004) The challenges of offering relationship and marriage education to low-income populations. *Family Relations*, 53(5), 440–447.
<https://doi.org/10.1111/j.0197-6664.2004.00052.x>
- Ponzetti, J. J., Jr. (2016). The evolution of relationship and marriage education. In *Evidence-based approaches to relationship and marriage education* (pp. 4–13). Routledge/Taylor & Francis Group.
- Radovanovic, Z., Shah, N., & Behbehani, J. (1999). Prevalence and social correlates to consanguinity in Kuwait. *Annals of Saudi Medicine* 19(3), 206–210.
<https://doi.org/10.5144/0256-4947.1999.206>
- Read, J. G. (2002). Challenging myths of Muslim women: The influence of Islam on Arab American women's labor force activity. *Muslim World*, 92(1-2), 19–37.
<https://doi.org/10.1111/j.1478-1913.2002.tb03730.x>
- Read, J. G. (2003). The sources of gender role attitudes among Christian and Muslim Arab-American women. *Sociology of Religion*, 64(2), 207–222.
<https://doi.org/10.2307/3712371>

- Read, J. G. (2004a). *Culture, class, and work among Arab American women*. LFB Scholarly Publishing.
- Read, J. G. (2004b). Cultural influences on immigrant women's labor force participation: The Arab-American case. *International Migration Review*, 38(1), 52–77. <https://doi.org/10.1111/j.1747-7379.2004.tb00188.x>
- Read, J. G., & Bartkowski, J. P. (2000). To veil or not to veil? A case study of identity negotiation among Muslim women living in Austin, Texas. *Gender & Society*, 14(3), 395–417. <https://www.jstor.org/stable/190135>
- Read, J. G., & Oselin, S. (2008). Gender and the education-employment paradox in ethnic and religious contexts: The case of Arab Americans. *American Sociological Review*, 73(2), 296–313. <http://www.jstor.org/stable/25472527>
- Reck, K., Higginbotham, B., & Dew, J. (2020). A longitudinal hierarchical examination of Smart Steps for Stepfamilies with ethnically and economically diverse couples. *Journal of Family Issues*, 41(2), 183–211. <https://doi.org/10.1177/0192513X19869385>
- Rhoades, G. K., Stanley, S. M., & Markman, H. J. (2009). Working with cohabitation in relationship education and therapy. *Journal of Couple and Relationship Therapy*, 8(2), 95–112. <https://doi.org/10.1080/15332690902813794>
- Samhan, H. (2015). Intra-ethnic diversity and religion. In S. C. Nassar-McMillan, K. J. Ajrouch, & J. Hakim-Larson (Eds.), *Biopsychosocial perspectives on Arab Americans: Culture, development, and health* (pp. 45–65). Springer.
- Skogrand, L., Barrios-Bell, A., & Higginbotham, B. (2009). Stepfamily education for Latino families: Implications for practice. *Journal of Couple & Relationship Therapy*, 8(2), 113–128. <https://doi.org/10.1080/15332690902813802>
- Timraz, S. M., Alhasanat, D. I., Albdour, M. M., Lewin, L., Giurgescu, C., & Kavanaugh, K. (2017). Challenges and strategies for conducting sensitive research with an Arab American population. *Applied Nursing Research*, 33, 1–4. <https://doi.org/10.1016/j.apnr.2016.09.009>
- Wheeler, L. A., Updegraff, K. A., & Thayer, S. M. (2010). Conflict resolution in Mexican-Origin couples: Culture, gender, and marital quality. *Journal of Marriage & Family*, 72(4), 991–1005. <https://doi.org/10.1111/j.1741-3737.2010.00744.x>
- Youssef, J., & Deane, F. P. (2006). Factors influencing mental-health help-seeking in Arabic-speaking communities in Sydney, Australia. *Mental Health, Religion & Culture*, 9(1), 43–66. <https://doi.org/10.1080/13674670512331335686>
- Zarean, M., & Barzegar, K. (2016). Marriage in Islam, Christianity, and Judaism. *Religious Inquiries*, 5(9), 67–80. http://ri.ur.ac.ir/article_43969.html

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Acknowledgment

The authors gratefully acknowledge the financial support of The Dr. Philip M. Kayal Fund for Arab American Research.

Evaluation of Recipes for Life Nutrition Education Program for Fifth-Grade Students

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Emerging research indicates that chronic illnesses exacerbated by obesity begin in childhood. While research continues to show that consumption of fruits and vegetables can lower rates of obesity, children in the United States often fall short of consuming the recommended daily intake of fruits and vegetables. Youth nutrition education and cooking education programs have emerged as proven strategies for promoting youth consumption of fruit and vegetables, and other factors (e.g., nutrition knowledge, food-related behaviors, food preferences, attitude toward cooking, and cooking self-efficacy) that mediate youth consumption of fruits and vegetables. The purpose of this study was to evaluate the impact of the Recipes for Life program, a field-trip-based nutrition education program, on fifth-grade students. Results showed that the program elicited pre-post improvements in students' content knowledge, cooking self-efficacy, and cooking attitudes.

Keywords: youth nutrition education, cooking self-efficacy, cooking attitudes, recipes for life program

Introduction

Childhood obesity is one of the most pressing public health concerns of the 21st century, as obesity rates have increased steadily over the last four decades in developed countries, including America. Centers for Disease Control and Prevention data from 2017–2018 indicate obesity rates in the United States among children ages six to eleven have increased to 20.3% from 4.0% in the early 1970s (Fryar et al., 2020). Emerging research indicates that chronic illnesses exacerbated by obesity (e.g., type 2 diabetes and coronary heart disease) begin in childhood (Sahoo et al., 2015). Research findings show that higher levels of fruit and vegetable consumption are associated with lower levels of obesity (Yu et al., 2018); however, both adults and children in the United States often fall short of consuming the recommended daily intake of fruits and vegetables.

Youth nutrition education and cooking education programs are proven strategies for enhancing youth consumption of fruit and vegetables and their willingness to try new foods (Bai et al., 2018; Cunningham-Sabo et al., 2013, 2014). Moreover, several studies have also documented the positive effects of nutrition education on the factors (e.g., nutrition knowledge, food-related behaviors, food preferences, attitude toward cooking, and cooking self-efficacy) that mediate youth consumption of fruits and vegetables (Hersch et al., 2014; Nelson et al., 2013; Wall et al., 2012). In their evaluation of a community-based nutrition and cooking education program for low-income elementary and middle school students, Jarpe-Ratner and colleagues (2016) reported pre-post improvements in students' nutrition knowledge and cooking self-efficacy. Likewise, Wolfe and Dollahite (2021) reported that a school-based cooking curriculum for third through sixth-grade students elicited an increase in fruit and vegetable intake and an increased likelihood of trying new foods. Oakley et al. (2017) reported that a peer-led culinary skills intervention for adolescents improved sixth- and seventh-grade students' cooking attitudes; however, the gains did not persist at three and six months post-program follow-ups. Cunningham-Sabo and Lohse (2014) found that pre-post improvements in cooking attitudes were higher among male students, with or without previous cooking experience. Studies evaluating classroom-based nutrition education programs that incorporate fruit and vegetable tasting components have also reported increased fruit and/or vegetable preferences, intention to consume more vegetables, and the likelihood of trying new foods (Bai et al., 2018; Cunningham-Sabo et al., 2014; Gold et al., 2017; Wolfe et al., 2021).

While these studies point to the benefits of nutrition education programs for youth in general, the advantages for limited-resource youth cannot be overemphasized. Nutrition education and cooking programs provide youth from socio-economically disadvantaged backgrounds with opportunities to learn cooking and food preparation skills that otherwise may be unavailable to them. Several Cooperative Extension programs targeting Supplemental Nutrition Assistance Program (SNAP)-eligible youth audiences have shown positive impacts on nutrition knowledge, cooking self-efficacy, cooking attitude, and increased fruit and vegetable consumption (Adedokun et al., 2020; Cunningham-Sabo et al., 2014; Gold et al., 2017; Wall et al., 2012).

The advantages notwithstanding, a notable gap in the literature is that much of youth nutrition programming tends to focus on interventions implemented in classroom and after-school settings. For example, the Cooking with Kids program (Cunningham-Sabo et al., 2013, 2014), the Chefs Adopt a School program (Caraher et al., 2013), and the Cookshop program (Liquori et al., 1998) all include in-class student food preparation elements. However, some participating schools lacked the resources to allow in-class food preparation and could only allow tasting of prepared food. Cunningham-Sabo and Lohse's 2014 article used this variation to compare the outcomes of the Cooking with Kids curriculum implementation involving both cooking and tasting to the same curriculum with tasting only. Their results indicated a greater improvement in fruit and vegetable preference for participants in the hands-on food preparation (cooking) group.

Only a few programs found in the literature mention the inclusion of experiential learning beyond the classroom. Some of these experiences include working in school gardens either during or after school (Gibbs et al., 2013; Jaenke et al., 2012; Parmer et al., 2009). Others, like the Common Threads program (Jarpe-Ratner et al., 2016), are held after school at school locations, and programs like CHEF Bites (Schmidt et al., 2022) are held at Boys and Girls Clubs after the school day. Fewer programs combine classroom nutrition and cooking instruction with opportunities for field trips such as field trips to farmers markets (e.g., Davis et al., 2011), community farms (e.g., Thomas et al., 2011), and other local food systems (e.g., Harley et al., 2018).

The purpose of this study was to evaluate the impact of the University of Kentucky's Recipes for Life (RFL) program on student outcomes. Specifically, the study reports on the extent to which the program enhanced students' content knowledge, cooking self-efficacy, cooking attitudes, intentions to eat more fruits and vegetables, try new foods, and help prepare food at home.

Program Description

The Recipes for Life (RFL) program is a hands-on cooking and nutrition education program for fifth-grade students. The two core components of the program are the implementation of RFL curriculum lessons in the classroom and a field trip where students are transported from their schools to the county Extension office to gain firsthand experience in recipe preparation. The University of Kentucky's Nutrition Education Program (NEP) developed RFL to teach limited-resource fifth-grade students about nutrition education, food and kitchen safety, and food preparation skills. The goal of the program is to enhance students' content knowledge, cooking self-efficacy, cooking attitudes, and intentions to try new foods, eat more fruits and vegetables, and help prepare food at home. Family and Consumer Sciences (FCS) and 4-H Youth Development Extension educators implemented RFL during school hours, with support from NEP program assistants and adult volunteers.

Prior to program implementation, FCS and 4-H Extension educators participated in a half-day in-person training conducted by University of Kentucky Extension specialists. Training topics included a description of the RFL program model and learning objectives; school recruitment strategies; demonstration of the curriculum resources, content, and recipes; strategies for partnering with school administrators/teachers; program planning and evaluation procedures; and program implementation requirements (e.g., equipment and facilities needed and a timeline for implementation). Extension educators, in turn, delivered training to program assistants and adult volunteers who provided support during program implementation. Topics covered during volunteer and program assistant training included a description of lessons and content of the RFL curriculum, strategies for interacting with students, and hands-on recipe preparation.

The RFL program implementation plan stipulated adherence to the core program components (i.e., curriculum lessons in the classroom along with the field trip to the Extension office for

recipe preparation) to enhance implementation fidelity across counties. But Extension educators were also afforded some flexibility in program delivery to accommodate differences in their local contexts. Program delivery decisions were predicated upon contextual factors, including willingness of the school to allow in-class lesson delivery, length of the field trip approved by the school (i.e., half versus whole day), and the number of adult volunteers available to assist with implementation. Initial planning with schools included discussion regarding field trip scheduling, program description, and program alignment with school curriculum. Extension educators coordinated with school personnel in person or virtually. Educators had the choice of delivering the lessons during the field trip (i.e., at the Extension office) or before the field trip (i.e., in the classroom). Table 1 provides an overview of the curriculum lessons. Each lesson required 15–30 minutes to implement. Educators who chose to deliver lessons before the field trip typically visited the school and taught the lessons during class instruction time (e.g., as part of the school's health class).

Table 1. Curriculum Lesson Overview

Lesson Title	Concepts Covered
<i>MyPlate and Nutrition Concepts</i>	What it means to be healthy, how eating a variety of foods provides the body with different nutrients, and how to use MyPlate to choose healthy meals that include foods from all the food groups.
<i>Handwashing</i>	Why handwashing is important in food preparation, when to wash hands, and demonstration of the steps to clean hands properly.
<i>Food Safety</i>	Food safety issues that can arise in the kitchen, including personal hygiene, demonstration of proper dish and kitchen cleaning, demonstration of ways to prevent cross-contamination, how to wash produce, demonstration of using a meat thermometer correctly, and how to store foods safely.
<i>Kitchen Safety</i>	Burn avoidance, fire safety, and using appliances safely.
<i>Knife Safety and Skills</i>	How to properly hold and use a knife, how to use a cutting board, how to safely hold and guide food while cutting, and basic food-cutting techniques.
<i>Measuring Skills</i>	Properly identify measuring tools and demonstration of how to measure ingredients accurately.
<i>Meal Planning</i>	Concepts of meal planning and time management problem-solving skills using activity sheets.
<i>Recipe Identification and Modification</i>	Basic parts of a recipe and problem-solve practical issues like doubling or halving a recipe.

The RFL program model incorporates experiential learning in a field trip format. Kolb (1984) defined experiential learning as a process whereby knowledge is created through a transformative learning experience. Kolb described learning as a continuous process that is interactive, reflective, and applied. In line with Kolb's theory, RFL included interactive applied learning during the field trip to Extension offices, where students had access to large standard kitchen spaces. Extension educators could choose to have students remain at one assigned workstation or rotate to different stations. Extension educators also chose the number of recipes prepared by students, with some selecting to have students make one or multiple recipes at one

workstation, while other educators selected to have students rotate workstations to prepare multiple recipes. All options resulted in a total of three to eight prepared recipes. Depending on the size of the group, the selected recipes were prepared multiple times to allow a full serving for each student during the meal. The RFL curriculum includes a total of twenty-six recipes that fall into five different categories: starters and snacks, meats and main dishes, vegetable salads and sides, breads and bars, and fruit recipes. Typically, one recipe from each category was prepared.

Adult volunteers led each station to facilitate critical thinking about the process of food preparation, help students to reflect on and consider broader skills gained from the lessons, and consider ways to apply concepts learned in daily life. The recipes represented a variety of food groups, meals, and food preparation techniques. The recipes appealed to students while also meeting NEP standards for nutrition content. For example, the oven-baked chicken nugget recipe was an option. Chicken nuggets are a popular food for students. By adjusting the recipe to make them healthier, with less sodium and saturated fat than the typical fried version, students recognize that their favorite foods can be both healthy and delicious. Additionally, most recipes incorporated fruits and vegetables (e.g., sizzlin' chicken and rice, broccoli spoonbread, easy cheesy spinach, zucchini, and carrot muffins) with the intention to encourage consumption of these food groups beyond the program.

After recipe preparation, students reconvened in a large group and shared a meal consisting of what they had prepared. The shared meal afforded students additional opportunities for reflective processing of lessons learned, as volunteers asked open-ended questions about how students intended to use their new knowledge of nutrition and food preparation. At the end of the field trip, students were provided with cooking booklets that included food preparation information and recipes, along with reinforcement items (e.g., measuring cups, cutting board, measuring spoons, and aprons) to support nutrition and cooking behavior change.

Methods

Evaluation Design

Evaluation of the impact of RFL on student outcomes involved a single-sample pretest-posttest design. The University of Kentucky Institutional Review Board approved the study protocol. Evaluation data reported in this study came from students ($N = 753$) in the five rural counties that implemented RFL and provided useful outcome evaluation data between the spring of 2019 and before the onset of the COVID-19 pandemic in the spring semester of 2020. Table 2 provides a description of implementation characteristics in each of the five counties.

Table 2. County and Student Characteristics

County	# of Students	# Recipes Prepared by Students	FRL (%)	Male (%)	Female (%)
County A	157	2	57	70 (44.6)	87 (55.4)
County B	89	5	64	41 (46.1)	44 (53.9)
County C	120	1	60	58 (48.7)	61 (51.3)
County D	322	3	41	154 (47.8)	168 (52.2)
County E	65	1	56	20 (30.8)	45 (69.2)
Total	753			343 (45.6)	409 (54.4)

Note. # = Number; FRL (%) = Free and Reduced Lunch percentage

Educators administered a multi-section pre-posttest before and after program participation to assess the program's impact on students. Specifically, the evaluation instrument assessed students' knowledge of lesson content (e.g., MyPlate, food safety, kitchen safety, food preparation skills), cooking self-efficacy, and cooking attitudes. The posttest also assessed students' intentions to make behavioral changes after participating in the program (i.e., eating more fruits and vegetables, helping prepare food at home, and trying new foods). Between 2016 and the spring of 2018, RFL program evaluators, Extension educators, and content specialists reviewed pilot versions of the pre-posttest instrument for content validity and alignment with curriculum learning outcomes. Content specialists used the findings of the face and content validity assessments to identify problematic questions and later removed them from the pre-posttest.

Measurement of Program Outcome Variables

Content knowledge was assessed with seventeen items targeting students' understanding of the concepts covered in the curriculum, particularly food safety (e.g., food storage to avoid contamination), kitchen safety (e.g., knife skills and positioning of the pot while cooking on the stove) and food preparation (e.g., order of meal preparation and measuring ingredients). Students' responses to these questions were coded as 1 (*correct*) or 0 (*incorrect*) and summed to create an overall knowledge score (with a maximum total score of 17) at pretest and posttest.

Cooking self-efficacy was measured using a modified version of the Cooking with Kids self-efficacy scale (Cunningham-Sabo et al., 2014; Woodruff et al., 2013). The scale included eight items regarding students' self-perceived ability to perform certain cooking activities (e.g., make a salad, cut food with a knife, follow a recipe, etc.). Response categories for the eight items ranged from 1 (*very hard*) to 4 (*very easy*). Students' responses to these eight items were combined to create a summated rating scale for a maximum total score of 32 on the scale. Cronbach's alpha for the scale was .68 at pretest and .79 at posttest. Exploratory factor analyses were conducted to justify combining the eight items into a single variable. Factor loadings for the items ranged from .50 to .63 at pretest and .53 to .73 at posttest (Costello & Osborne, 2005). All factor loadings were statistically significant at $p < .05$.

Cooking attitudes were measured as a total score on seven items regarding students' feelings about cooking, measuring ingredients, making food with their family/friends, etc. Response categories for the items ranged from 1 (*really don't like*) to 5 (*really like*). Students' responses to the items were combined to create a summated rating scale, with 35 being the maximum possible total score. Cronbach's alpha for the scale was .73 at pretest and .78 at posttest. Exploratory factor analyses were conducted to justify combining the items into a single variable. Factor loadings for the items ranged from .58 to .78 at pretest and .59 to .78 at posttest (Costello & Osborne, 2005), and all factor loadings were statistically significant at $p < .05$.

The posttest also included questions regarding students' intentions to eat more fruits and vegetables, help prepare foods at home, and try new foods after participating in the program. Response categories for the items ranged from 1 (*strongly disagree*) to 4 (*strongly agree*). Response categories were collapsed into two—agree and strongly agree versus disagree and strongly disagree—for ease of analysis.

Data Analyses

Paired sample t -tests were used to examine pre-post changes in content knowledge, cooking self-efficacy, and cooking attitudes. As indicated in the program description, all program sites were required to implement the core program components (i.e., curriculum lessons in the classroom along with the field trip to the Extension office for recipe preparation) but were allowed flexibility regarding the length of the field trip, time of curriculum delivery, number of recipes prepared, and the choice of the same stations versus rotations during recipe preparation. Of note, implementation in County A was different from the other four counties. County A implemented a half-day field trip (others implemented full-day field trips), did not implement all lessons in the curriculum (County A omitted two lessons while others implemented the entire curriculum), and implemented lessons only during the field trip (others implemented lessons both before and during school visits, and during the actual field trip to Extension offices). Hence, independent sample t -tests were conducted to examine if the differences in implementation between County A and the other counties influenced student outcomes. For all dependent and independent samples t -tests, Cohen's (1998) effect sizes (d) were calculated to examine the practical significance of group differences. Based on the benchmark suggested by Cohen, d values of 0.2 are described as small (negligible), 0.5 as medium, and values of ≥ 0.8 as large effect sizes.

Three separate linear regression models were estimated to examine the effects of the number of recipes prepared, a key implementation characteristic, on student outcomes (i.e., content knowledge, cooking self-esteem, and cooking attitudes). Each of the regression models included students' self-reported sex and their baseline scores as control variables. The coefficient of determination, R^2 , was used to assess the percentage of variability in the dependable variable explained by each model. Finally, descriptive statistics (i.e., frequencies and percentages) were used to summarize students' responses to post-participation questions regarding their intentions

to eat more fruits and vegetables, help prepare food at home, and try new foods. All analyses were conducted in SPSS (version 27.0), with the statistical significance level set at $p < 0.05$.

Findings

Results of the paired sample t -tests comparing pre- and post-participation measures of program outcomes showed statistically significant improvements in students' content knowledge, cooking self-efficacy, and cooking attitudes (see Table 3). On average, content knowledge improved by 2.9 points from 10.3 in the pretest to 13.2 in the posttest, out of a maximum score of 17. Cooking self-efficacy improved by 2.4 points from 25.5 in the pretest to 27.9 in the posttest out of a maximum of 32. Likewise, cooking attitudes improved by 1.6 points from 29.6 in the pretest to 31.2 in the posttest, out of a maximum of 35. The effect sizes for these pre-post improvements signified moderate to large effects (i.e., an effect size of 1.2 for content knowledge, 0.6 for cooking self-efficacy, and 0.4 for cooking attitudes), indicating that the improvements were not only statistically significant but also practically meaningful.

Table 3. Pre-Post Changes in Content Knowledge, Cooking Self-efficacy, & Cooking Attitudes (N= 753)

Student Outcomes	Pretest Mean (SD)	Posttest Mean (SD)	p	Effect Size
Content Knowledge	10.3 (2.2)	13.2 (2.4)	< .001	1.2
Cooking Self-efficacy	25.5 (3.9)	27.9 (3.9)	< .001	0.6
Cooking Attitudes	29.6 (4.5)	31.2 (4.1)	< .001	0.4

Note. SD = Standard Deviation; p = Statistical Significance Level

Table 4 summarizes the findings of the independent samples t -tests comparing outcomes between students in County A and other counties. The results showed that students in County A had statistically similar outcomes as their counterparts in other RFL counties. The results showed nonsignificant group differences in entry, exit, and gain scores in content knowledge, cooking self-efficacy, and cooking attitudes.

Table 4. Independent Samples t -tests Comparing Student Outcomes Between County A and Other Counties (N= 753)

Student Outcomes		County A Mean (SD)	Other Counties Mean (SD)	p	Effect Size
Content Knowledge	Entry	10.4 (2.4)	10.2 (2.2)	.47	< 0.1
	Exit	13.0 (2.1)	13.3 (2.4)	.22	0.1
	Gain (Exit-Entry)	2.6 (2.2)	3.1 (2.6)	.06	0.2
Cooking Self-efficacy	Entry	25.4 (4.3)	25.4 (3.9)	.93	< 0.1
	Exit	28.1 (4.3)	27.8 (3.8)	.44	< 0.1
	Gain (Exit-Entry)	2.7 (4.2)	2.3 (3.7)	.34	< 0.1
Cooking Attitudes	Entry	29.5 (4.4)	29.5 (4.5)	.93	< 0.1
	Exit	31.6 (4.1)	31.0 (4.2)	.10	0.1
	Gain (Exit-Entry)	2.3 (1.4)	2.4 (1.9)	.78	< 0.1

Note. SD = Standard Deviation; p = Statistical Significance Level

Table 5 presents the results of the linear regression models that examined the effects of the number of recipes prepared on student outcomes. The results showed a statistically significant positive effect of the number of recipes prepared on content knowledge and cooking self-efficacy, but not cooking attitudes. Specifically, a unit increase in the number of recipes prepared increased pre-post gains in content knowledge by 0.17 points and pre-post gains in cooking self-efficacy by 0.26 points. The R^2 values for the models were .28 for Model 1, .25 for Model 2, and .10 for Model 3. The R^2 values indicate that Model 1 explained 28% of the variability in content knowledge, Model 2 explained 25% of the variability in cooking self-efficacy, and Model 3 explained 10% of the variability in cooking attitudes. These R^2 values suggest that there are still unexplained variabilities in each of the dependent variables.

Table 5. Regression Models Estimating the Effects of Number of Recipes Prepared on Content Knowledge, Cooking Self-efficacy, and Cooking Attitudes

Independent Variables	Dependent Variables		
	Model 1 Content Knowledge	Model 2 Cooking Self-efficacy	Model 3 Cooking Attitudes
Intercept	8.21 (0.46)*	13.88 (0.88)*	2.58 (0.48)*
Number of recipes prepared	0.17 (0.07)*	0.26 (0.10)*	0.08 (0.06)
Sex (Female vs Male)	0.22 (0.16)	-0.03 (0.25)	-0.02 (0.14)
Baseline Scores	-0.59 (0.04)*	-0.46 (0.03)*	-0.01 (0.02)

Note. * $p < .05$

Regarding student intentions, 91% of respondents plan to eat more fruits, 77% plan to eat more vegetables, 90% plan to try new foods, and 92% plan to help prepare foods at home.

Discussion and Implications

Overall, the findings suggest that RFL enhanced content knowledge, cooking self-efficacy, and cooking attitudes. These findings are similar to those of other youth nutrition and cooking education programs (Caraher et al., 2013; Cunningham-Sabo et al., 2014; Nelson et al., 2013; Wolfe et al., 2021). The findings also suggest that RFL promotes students' intentions to eat more fruits and vegetables, try new foods, and help prepare food at home after the program. In their evaluation of the *Choose Health: Food, Fun, and Fitness* curriculum for third- through sixth-grade students, Wolfe and Dollahite (2021) reported that the program elicited an increased likelihood of trying new foods.

Beyond the findings regarding the immediate effects of RFL on student outcomes, the results also offer insights into the potential effects of implementation characteristics on program outcomes and contribute to the identification and understanding of core versus optional program components. The results indicated statistically similar outcomes between participants in the counties that followed implementation requirements and the county that deviated from the requirements (i.e., County A). Unlike the other four counties, Extension educators in County A offered a half-day field trip, implemented lessons only during the field trip, and did not

implement all lessons in the curriculum. These findings suggest that the length of the field trip (half-day versus full-day), the omission of a few lessons from the curriculum, and the decision to implement lessons during and/or before the actual field trip may not be detrimental to student outcomes.

The results of linear regression models showed mixed results regarding the potential effects of the number of recipes prepared on student outcomes. On the one hand, the results showed statistically significant positive effects of the number of recipes prepared on pre-post gains in content knowledge and cooking self-efficacy. These findings are logical and not surprising. Recipe preparation is an opportunity for students to learn about nutrition concepts and to experience/practice cooking. On the other hand, the result showed nonsignificant effects of the number of recipes prepared on pre-post gains in cooking attitudes. These mixed findings warrant further studies to clarify program factors with the potential to promote or inhibit student outcomes. Such an implementation evaluation study would provide additional insights into the processes and conditions under which RFL successfully achieves its expected outcomes. For example, our data shows that the students in schools that implemented station rotation prepared at least three recipes (see Table 1). It is also logical to assume that full-day programs (versus half-day programs) may give students the opportunities to prepare additional recipes. Hence, further evaluation studies will help to clarify how the combination of station rotation and length of field trips influence the numbers of recipes prepared and student outcomes.

Limitations

This study is not without limitations. First, the study employed a single sample design with no comparison groups; hence, it is difficult to ascertain an empirical causal link between participation in RFL and the reported student outcomes. Second, the regression analyses explored the impact of only one program characteristic (number of recipes prepared) on student outcomes. Further evaluations of the program may explore the effects, if any, of other program characteristics such as station rotation, the experience of educators and volunteers, etc. Third, this study did not include sufficient demographic variables. For example, the pretest and posttest did not solicit information regarding students' race, ethnicity, or family income. Hence, the study is unable to offer any data-driven insights into how the program outcomes may differ by race. Likewise, the five participating counties were all rural counties. Hence, the study was unable to assess how program outcomes may differ between students in rural versus urban schools. The study did not include data on school characteristics and statistical comparisons across schools. Each Extension educator implemented in at least two schools within their county of assignment; however, four of the five educators did not collate student data by school. Hence, it was difficult to conduct school-level analyses. Future evaluations of RFL will collect data on school characteristics and examine how student outcomes differ by school.

References

- Adedokun, O. A., Bastin, S., Plonski, P., Najor, J., & Cotterill, D. (2020). Outcome evaluation of the Super Star Chef summer youth nutrition education program. *Journal of Extension*, 58(2), Article 13.
<https://tigerprints.clemson.edu/cgi/viewcontent.cgi?article=1160&context=joe>
- Bai, Y., Young-Hee, K., Young-Hee, H., & Hyun, T. (2018). Impact of a school-based culinary education program on vegetable consumption behavior, intention, and personal factors among Korean second-graders. *Nutrition Research and Practice*, 12(6), 527–534.
<https://doi.org/10.4162/nrp.2018.12.6.527>
- Caraher, M., Seeley, A., Wu, M., & Lloyd, S. (2013). When chefs adopt a school? An evaluation of a cooking intervention in English primary schools. *Appetite*, 62(1), 50–59.
<https://doi.org/10.1016/j.appet.2012.11.007>
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Lawrence Erlbaum Associates.
- Costello, A. B., & Osborne, J. (2005). Best practices in exploratory factor analysis: Four recommendations or getting the most from your analysis. *Practical Assessment, Research and Evaluation*, 10(7), 1–9. <https://doi.org/10.7275/jyj1-4868>
- Cunningham-Sabo, L., & Lohse, B. (2013). Cooking with Kids positively affects fourth graders' vegetable preferences and attitudes and self-efficacy for food and cooking. *Childhood Obesity*, 9(6), 549–556. <https://doi.org/10.1089/chi.2013.0076>
- Cunningham-Sabo, L., & Lohse, B. (2014). Impacts of a school-based cooking curriculum for fourth-grade students on attitudes and behaviors is influenced by gender and prior cooking experience. *Journal of Nutrition Education and Behavior*, 46(2), 110–120.
<https://doi.org/10.1016/j.jneb.2013.09.007>
- Davis, J. N., Ventura, E. E., Cook, L. T., Gyllenhammer, L. E., & Gatto, N. M. (2011). LA Sprouts: A gardening, nutrition, and cooking intervention for Latino youth improves diet and reduces obesity. *Journal of the American Dietetic Association*, 111(8), 1224–1230.
<https://doi.org/10.1016/j.jada.2011.05.009>
- Gibbs, L., Staiger, P. K., Johnson, B., Block, K., Macfarlane, S., Gold, L., Kulas, J., Townsend, M., Long, C., & Ukoumunne, O. (2013). Expanding children's food experiences: The impact of a school-based kitchen garden program. *Journal of Nutrition Education and Behavior*, 45(2), 137–146. <https://doi.org/10.1016/j.jneb.2012.09.004>
- Gold, A., Larson, M., Tucker, J., & Strang, M. (2017). Classroom nutrition education combined with fruit and vegetable taste testing improves children's dietary intake. *Journal of School Health*, 87(2), 106–113. <https://doi.org/10.1111/josh.12478>
- Harley, A., Lemke, M., Brazauskas, R., Carnegie, N. B., Bokowy, L., & Kingery, L. (2018). Youth Chef Academy: Pilot results from a plant-based culinary and nutrition literacy program for sixth and seventh graders. *Journal of School Health*, 88(12), 893–902.
<https://doi.org/10.1111/josh.12703>

- Hersch, D., Perdue, L., Ambroz, T., & Boucher, J. L. (2014). The impact of cooking classes on food- related preferences, attitudes, and behaviors of school-aged children: A systematic review of the evidence, 2003-2014. *Preventing Chronic Disease, 11*, 1–10.
<https://doi.org/10.5888%2Fpcd11.140267>
- Jaenke, R. L., Collins, C. E., Morgan, P. J., Lubans, D. R., Saunders, K. L., & Warren, J. M. (2012). The impact of a school garden and cooking program on boys' and girls' fruit and vegetable preferences, taste rating, and intake. *Health Education and Behavior, 39*(2), 131–141. <https://doi.org/10.1177/1090198111408301>
- Jarpe-Ratner, E., Folkens, S., Sharma, S., Daro, D., & Edens, N.K. (2016). An experiential cooking and nutrition education program increases cooking self-efficacy and vegetable consumption in children in grades 3-8. *Journal of Nutrition Education and Behavior, 48*(10), 697–705. <https://doi.org/10.1016/j.jneb.2016.07.021>
- Kolb, D. A. (1984). *Experiential learning: Experience as the source of learning and development*. Prentice-Hall.
- Liquori, T., Koch, P. D., Contento, I. R., & Castle, J. (1998). The Cookshop Program: Outcome evaluation of a nutrition education program linking lunchroom food experiences with classroom cooking experiences. *Journal of Nutrition Education, 30*(5), 302–313.
[https://doi.org/10.1016/S0022-3182\(98\)70339-5](https://doi.org/10.1016/S0022-3182(98)70339-5)
- Nelson, S. A., Corbin, M. A., & Nickols-Richardson, S. M. (2013). A call for culinary skills education in childhood obesity-prevention interventions: Current status and peer influences. *Journal of the Academy of Nutrition and Dietetics, 113*(8), 1031–1036.
<https://doi.org/10.1016/j.jand.2013.05.002>
- Oakley, A. R., Nelson, S. A., & Nickols-Richardson, S. M. (2017). Peer-led culinary skills intervention for adolescents: Pilot study of the impact on knowledge, attitude, and self-efficacy. *Journal of Nutrition Education and Behavior, 49*(10), 852–857.
<https://doi.org/10.1016/j.jneb.2017.07.006>
- Parmer, S. M., Salisbury-Glennon, J., Shannon, D., & Struempfer, B. (2009). School gardens: An experiential learning approach for a nutrition education program to increase fruit and vegetable knowledge, preference, and consumption among second-grade students. *Journal of Nutrition Education and Behavior, 41*(3), 212–217.
<https://doi.org/10.1016/j.jneb.2008.06.002>
- Sahoo, K., Sahoo, B., Choudhury, A. K., Sofi, N. Y., Kumar, R., & Bhadoria, A. S. (2015). Childhood obesity: Causes and consequences. *Journal of Family Medicine and Primary Care, 4*(2), 187–192. <https://doi.org/10.4103%2F2249-4863.154628>
- Schmidt, S., Goros, M. W., Gelfond, J. A. L., Bowen, K., Guttersen, C., Messbarger-Eguia, A., Feldmann, S. M., & Ramirez, A. G. (2022). Children's after-school culinary education improves eating behaviors. *Frontiers in Public Health, 10*, 719015.
<https://doi.org/10.3389/fpubh.2022.719015>

- Thomas, H. M. C., & Irwin, J. D. (2011). Cook It Up! A community-based cooking program for at-risk youth: Overview of a food literacy intervention. *BMC Research Notes*, 4, 495. <https://bmcresearchnotes.biomedcentral.com/articles/10.1186/1756-0500-4-495>
- Wall, D. E., Least, C., Gromis, J., & Lohse, B. (2012). Nutrition education intervention improves vegetable-related attitude, self-efficacy, preference, and knowledge of fourth-grade students. *Journal of School Health*, 82(1), 37–43. <https://doi.org/10.1111/j.1746-1561.2011.00665.x>
- Wolfe, W. S., & Dollahite, J. (2021). Evaluation of the Choose Health: Food, Fun, and Fitness 3rd- to 6th-grade curriculum: Changes in obesity-related behaviors. *Journal of School Health*, 91(1), 9–18. <https://doi.org/10.1111/josh.12970>
- Woodruff, S. J., & Kirby, A. R. (2013). The associations among family meal frequency, food preparation frequency, self-efficacy for cooking, and food preparation techniques in children and adolescents. *Journal of Nutrition Education and Behavior*, 45(4), 296–303. <https://doi.org/10.1016/j.jneb.2012.11.006>
- Yu, Z. M., DeClercq, V., Cui, Y., Forbes, C., Grandy, S., Keats, M. Parker, L., Sweeney, E., & Drummer, T. J. B. (2018). Fruit and vegetable intake and body adiposity among populations in Eastern Canada: The Atlantic Partnership for Tomorrow's Health Study. *BMJ Open*, 8(4). <https://doi.org/10.1136/bmjopen-2017-018060>

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Acknowledgments

This evaluation study is part of the University of Kentucky's SNAP-Ed program, funded by the USDA through an award to the University of Kentucky Cooperative Extension Service. The USDA is an equal opportunity provider.

Cost of Care Conversations: Perspectives from Rural Health Care Providers and Older Adult Patients

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Older adults often struggle with health care costs. Cost of care (CoC) conversations are conversations between health care providers and patients to discuss direct and indirect costs associated with health care. These conversations have been found to increase patient compliance, but patients and health care providers often do not have these discussions. This article describes a project to provide Extension education to encourage CoC conversations for older adults and health care providers in rural counties in a southern state. To inform educational material development, 125 older adults and 51 health care providers completed surveys about their cost-related barriers to health care, attitudes and frequency of CoC conversations, and preferred educational methods. Older adults reported that they were most comfortable discussing health care costs with physicians and pharmacists but that health care providers rarely initiated these conversations. Health care providers indicated that they were comfortable talking about health care costs with patients and reported that they often initiate these conversations. Both older adults and health care providers indicated fact sheets as a top educational method. This project demonstrates how Extension educators can partner with health care providers to educate older adults about communicating cost-related challenges and needs.

Keywords: cost of care conversations, older adults, health care providers, health care costs

Introduction

Health care costs remain top of mind for consumers in the United States (Perez et al., 2019). Nearly one in three individuals in the US report struggling to pay health care bills (Richman &

Brodie, 2014). These struggles can sometimes lead to catastrophic financial consequences such as damaged credit and personal bankruptcies (Cook et al., 2010). Southern states lead the country in medical debt, with nearly 24% of all residents in this region reporting such debt as well as having the largest average amounts of past-due medical debt (Kluender et al., 2021).

Today, patients are responsible for an increasingly larger portion of out-of-pocket expenses (Sloan & Ubel, 2019). High-deductible health care plans are more common (Brick et al., 2019). Furthermore, projections indicate that patients will have increased costs related to prescription drugs and treatments for older adults, such as home health care (Keehan et al., 2017). Higher out-of-pocket costs and more expensive interventions have created a burden for consumers who must balance health care costs and their ability to provide for other necessities of daily living like food, clothing, and basic household items.

Cost discussions between health care providers and patients can help mediate the financial challenges patients face while improving health care decision-making (Henrikson et al., 2019). Referred to in the literature as cost of care (CoC) conversations, these discussions between health care providers and patients hold a promise for helping consumers make informed choices about health care interventions and health outcomes. Additionally, CoC conversations have been linked to higher compliance and stronger relationships between patients and health care providers. In their study of 912 patients with diabetes recruited from five Veteran Affairs health systems, Piette and colleagues (2005) found that trusting relationships between physician and patient were critical in moderating the impact of costs on patients' adherence to medical therapies. In their study of 677 outpatient appointments for breast cancer management, Hunter and colleagues (2017) found oncologists and patients were willing to engage in cost conversations. The conversations were often initiated by the health care provider and lasted a median duration of 33 seconds. Furthermore, over a third of the conversations focused on strategies to reduce patient costs for treatment.

Despite evidence pointing to the positive effects of CoC conversations, patients and health care providers struggle to incorporate CoC conversations into practice systematically. Due to a lack of knowledge and training, many physicians do not feel well-equipped to discuss costs with their patients. A study of 167 oncologists revealed that over half (58%) sometimes or rarely discussed treatment with patients (Schrag & Hanger, 2007). Thirty-one percent reported a high degree of discomfort discussing patient costs. According to work from the Robert Wood Johnson Foundation's Cost Conversation Projects, health care providers report difficulty identifying patients in financial distress, lack of understanding of local resources which can support patients, and are often unable to estimate costs of treatment plans (Dine et al., 2019). On the other hand, patients are hesitant to initiate CoC conversations. They fear that doing so would be perceived as inappropriate, a challenge to the provider-patient relationship, and an unwise use of valuable provider-patient time (Erwin et al., 2018). In their study on patients' knowledge of office copayments, Benedetti and colleagues (2008) found less than 5% of survey respondents actually

discussed health care costs with their provider. Additionally, almost 80% (79%) felt their health care provider could not help with cost issues. Over half (51%) believed it was not appropriate to discuss costs with health care providers. These challenges create a dichotomy in which patients want to have CoC conversations yet are waiting for their providers to initiate the conversations, while providers, in turn, believe such conversations can be beneficial but are reluctant to initiate the discussions.

CoC conversations between patients and providers are even more crucial in older adults, who often utilize the health care system at higher levels than younger people. Even though the older adult population is predominantly insured by Medicare, out-of-pocket costs are still a concern, particularly among low-income residents. According to Cubanski and colleagues (2019), older adults with traditional Medicare coverage spent an average of \$5,460 out of their own pocket for health care; these costs represent up to 16% of their income. Moreover, older adults in the South spent more than their counterparts in the Northeast and West. Finally, women, people in older age groups, those in poor health, and with multiple chronic conditions spend more as well.

Older adults residing in rural areas face their own unique needs when compared to their urban or suburban counterparts (Kaye & Long, 2021). Rural areas have higher concentrations of older adults than urban areas. Around 19% of rural populations are 65 years or older compared to 15% in urban areas (Cromartie, 2021). Older adults in rural communities tend to be poorer, have complex health conditions with multiple comorbidities, often lack access to essential services such as transportation, and are more food insecure (Pooler et al., 2017). Rural older adults are challenged to navigate a health care landscape characterized by diminished access, hospital closures, and a lack of health care resources (Pender et al., 2019).

Study Objectives

The main objectives of this study were to identify facilitators and barriers for CoC conversations among rural older adult patients and health care providers with the purpose to use this information to guide the development and implementation of patient and provider training related to increasing CoC conversations.

The results discussed here are part of a larger United States Department of Agriculture Rural Health and Safety Education grant-funded project to utilize Extension educators as catalysts for promoting CoC conversations between older adults and health care providers in rural communities. Formative research was conducted at the start of the project to collect input from health care providers and older adults in the Appalachian region with the purpose to inform the development of CoC educational resources that would resonate with both rural health care providers and patients. This article describes the process and outcomes of this formative research. Following a description of the methods, key findings from the research are presented. These findings and the implications they hold for Extension's work in health education and Extension's engagement with health care providers conclude the article.

Methods

This cross-sectional survey study assessed facilitators and barriers to CoC conversations in five rural counties in Tennessee. Institutional Review Board (IRB) approval was received for this study as an expedited approval from the University of Tennessee IRB-20-06058-XP.

Participants

Convenience samples of both health care providers and older adults were recruited to participate in this study. The research team asked Extension Agents in five targeted counties to recruit at least 10 rural health care providers. To get information from a variety of health care providers about CoC, the research team had a broad definition of health care providers that included physicians, nurses, physician assistants, and nurse assistants, as well as pharmacists and office staff who worked in health care facilities.

Extension Agents in targeted counties also were instructed to recruit at least 25 older adults to take the patient surveys. Older adults were defined as adults ages 55 and older. These older adults tended to be participants in existing Extension programs that the agent was delivering in the community.

Measures

Two surveys were created for this study: one for health care providers and one for older adults who are referred to as patients. The surveys were reviewed and edited by four expert health care providers and pilot-tested with 25 older adult patients. Feedback from both groups was incorporated into the final versions of the surveys.

Patient Surveys

Costs as a barrier to health care. Cost-related barriers to health care were assessed with questions that identified barriers as well as frequency or how often costs prevented health care. Barriers were identified using a question that listed seven potential cost-related barriers to health care: “What costs make it difficult for you to receive medical care?” Patients could select all applicable costs that make it difficult for them to receive medical care, with an additional option to write in any barriers not included in the list. This list included indirect costs of health care like transportation, childcare, and elder care as well as health care costs related to insurance such as deductibles and copays. The frequency measure included four questions where patients reported how often they were unable to go to a health care provider, follow recommended treatment, fill prescriptions, and follow health care advice using a 5-point Likert scale (1 = *never* to 5 = *always*).

Cost of care conversations. Assessment of CoC conversations included questions related to frequency, level of comfort, barriers to CoC, and educational methods to help facilitate

CoC. For frequency, patients answered three questions related to how often they discussed health care costs with doctors, nurses or office staff, and pharmacists. An additional question asked how often health care providers discussed CoC before visits. All four questions used a 5-point Likert scale (1 = *never* to 5 = *always*). Level of comfort was assessed using one question: “Who would you feel comfortable talking about medical costs with?” Patients could select all applicable options from a list of seven health care professionals, such as physicians, nurses, nurse practitioners, pharmacists, and office staff, with an option to write in any health care professional who was not included on the list. Barriers to CoC conversations were measured using one question: “What makes it hard to talk with health care providers about medical costs?” Patients could select all applicable barriers from a list of five that included lack of time, not sure who to discuss costs with, and worried that they might not receive medical care, with a write-in option for additional barriers. Preferred learning methods to facilitate CoC conversations were assessed using one question: “How would you like to learn about how to talk with health care providers about medical costs?” Patients could select all applicable learning methods from a list of six that included educational programs, Facebook posts, one-on-one discussions with health care providers, videos, and brochures, with a write-in option to include additional learning methods.

Health Care Provider Surveys

Costs as a barrier to health care. Assessment of cost-related barriers included four questions where health care providers were asked to rate the different financial stressors facing their patients on a 5-point Likert scale (1 = *strongly disagree* to 5 = *strongly agree*). Financial stressors included financial burdens related to costs of medical treatment, such as copays and prescriptions, as well as costs related to health promotion and prevention, such as eating healthier and being more physically active.

Cost of care conversations. Assessment of CoC conversations included questions related to frequency, level of comfort, barriers to talking with health care providers about CoC, and preferred tools to facilitate CoC conversations. The frequency of CoC was assessed using one question: “How frequently do you discuss costs of treatment with patients?” This question used a 5-point Likert scale (1 = *never* to 5 = *always*). Level of comfort discussing CoC was assessed using four questions that included discussing costs related to health care treatment, prescriptions, and health care promotion and prevention, such as eating healthy and being physically active. These questions used a 5-point Likert scale (1 = *very uncomfortable* to 5 = *very comfortable*). Barriers to CoC conversations were assessed using one question: “What barriers prevent you from engaging in cost-of-care conversations with your patients?” Health care providers could select all applicable barriers from a list of 10, such as lack of time, lack of knowledge about costs, and lack of comfort, with a write-in option for additional barriers. Preference related to tools to facilitate CoC conversations was assessed using one item: “What tools would you like to facilitate cost-of-care conversations?” Health care providers could select

all applicable tools from a list of three tools that included online trainings, consultations, and fact sheets, with a write-in option for additional tools.

Statistical Analyses

All items were examined through frequencies and descriptive statistics using SPSS 28.0.

Results

Patient Surveys

From the five counties, 125 patients completed the surveys (Table 1). Almost all of the respondents identified as white (94%), and over half (62%) were women. The mean age was 66 years, ranging from 34 to 96 years. The median educational level was some college, and the median household income was between \$25,001 to \$50,000 annually. Over half of respondents were on Medicare (51.3%), with 38.5% being on employer insurance and 3.4% on Medicaid. The number of health care visits annually ranged from none to 30, with a mean of almost 6 (5.85) visits.

Table 1. Demographic Characteristics of Patient Survey Respondents

Characteristic	<i>n</i>	Percentage
Gender		
Male	48	38.4
Female	77	61.6
Age in years		
Under 50	7	5.0
50 – 59	31	24.8
60 – 69	39	31.2
70 – 79	25	20.0
80 – 89	14	11.2
90 and older	2	1.6
Missing	7	5.6
Race/ethnicity		
White	117	93.6
Other	5	4.0
Missing	3	2.4
Educational Level		
High school or less	4	3.2
High school graduate/GED	40	32.0
Some college	27	21.6
Bachelor's degree	24	19.2
Master's degree or higher	14	11.2
Missing	16	12.8

Characteristic	<i>n</i>	Percentage
Annual household income		
Less than \$10,000	11	8.8
\$10,001 - \$15,000	17	13.6
\$15,001 - \$20,000	13	10.4
\$20,001 - \$25,000	11	8.8
\$25,001 - \$50,000	21	16.8
\$50,001 - \$100,000	27	21.6
More than \$100,000	4	3.2
Missing	21	16.8

Costs as Barriers to Health Care

The top three cost-related barriers to health care identified by patients were associated with insurance costs, with half of respondents (50.2%) selecting insurance deductibles, 30.4% selecting insurance copays, and 20.8% selecting the overall cost of insurance. Few patients indicated that costs prevented them from following through with medical appointments and purchasing prescriptions, with slightly more patients reporting that costs were a barrier to following health care advice related to healthy eating and exercising (Table 2).

Table 2. Frequency of Costs Preventing Health Care for Patients

In the last year, how often were you not able to do the following due to the cost?	<i>N</i>	Percentage reporting often or always (<i>n</i>)
Go to a health care provider	123	7.2% (9)
Fill a prescription	118	10.4% (13)
Follow the recommended treatment (like buy a knee brace, OTC medications, or bandages)	119	13.6% (17)
Follow the advice of your health care provider (like healthy eating, fitness, etc.)	122	14.4% (18)

Cost of Care Conversations

Over half of respondents (59.2%) reported that health care providers rarely or never initiated CoC. Most patients reported that they would prefer to discuss CoC with physicians (71.2%) and pharmacists (60.0%). Similarly, patients reported that they had more frequent CoC conversations with pharmacists (2.41) compared to physicians (2.09). About one-quarter of patients indicated that they did not initiate CoC conversations because of limited time, they had not thought about having these conversations, they were not sure who to talk to about costs, and they were not sure how to start the conversation (Table 3).

Table 3. Barriers for CoC Conversations Identified by Patients

What makes it hard to talk to medical providers about health care costs?	Percentage (Number)
Not sure who to talk to about costs of care	27.2% (34)
Not enough time	26.4% (33)
Not sure how to start the conversation	24.8% (31)
I never thought to talk about costs with my health care provider.	24.0% (30)
Worried that I might not receive care	9.6% (12)
Not comfortable talking about medical costs	6.4% (8)

Most respondents (67.2%) selected having one-on-one conversations with health care providers as the top way they would want to learn about CoC conversations, followed by written brochures (42.4%).

Health Care Provider Surveys

From the five counties, 51 health care providers completed surveys. Most respondents were women (83%) and were white (86%). Nurses represented the largest number of health care providers, completing 24 surveys or almost half (47%) of the responses. Far fewer responses were received from health care provider office staff (6 responses), pharmacists (4 responses), nurse practitioners (3 responses), and nurse assistants (2 responses). Only one survey was received from a physician. Other responders included a first responder, an executive director of health care services, a health educator, a home health provider, and a medical biller.

Costs as a Barrier to Health Care

Health care providers were aware that many of their patients faced different types of financial barriers to health care. They also reported high levels of comfort about discussing these costs with their patients (Table 4).

Table 4. Barriers and Level of Comfort Discussing Barriers with Patients

Issue	Barrier to care for patientsⁱ		Comfortable discussing with patientsⁱⁱ	
	N	Mean (SD)	N	Mean (SD)
Cost of health care treatments	50	4.54 (.71)	47	4.15 (.96)
Cost of health care visits (copays, deductibles, etc.)	51	4.49 (.73)	47	4.15 (.91)
Cost of medications and prescriptions	51	4.47 (.76)	47	4.17 (.94)
Cost of health promotion and prevention (such as eating healthier foods, participating in physical activity, etc.)	51	4.29 (.90)	46	4.00 (.99)

ⁱResponse scale ranged from 1 to 5 with 1 = *strongly disagree* to 5 = *strongly agree*.

ⁱⁱResponse scale ranged from 1 to 5 with 1 = *not comfortable at all* to 5 = *very comfortable*.

Cost of Care Conversations

A majority of respondents (65%) indicated that they often or always initiated CoC conversations with their patients. Health care providers indicated that the top selected barriers related to CoC were not being able to provide adequate solutions to patients' concerns and lack of knowledge about different costs (Table 5).

Table 5. Barriers to Initiating CoC Conversations with Patients

What barriers prevent you from engaging in CoC conversations with your patients?	Percentage (Number)
Not able to provide adequate solutions	54.9% (28)
Lack of knowledge about the costs of treatment	45.0% (23)
I am concerned that I will give out incorrect information.	39.2% (20)
Lack of knowledge about insurance	37.3% (19)
Lack of knowledge about the costs of medication	37.3% (19)
Lack of knowledge about the cost of the health care visit	31.4% (16)
Lack of time	29.4% (15)
I do not feel that these conversations are my responsibility.	15.7% (8)
I am concerned that my patients will not be receptive.	10.0% (5)
I am not sure how to start the conversation.	3.9% (2)

Most health care providers (83.4%) selected fact sheets with information as the preferred tool to help facilitate CoC conversations. Over a quarter (25.2%) preferred online trainings.

Discussion

This study provides insight into the issues related to CoC conversations among rural health care providers and patients. In this study, most providers felt comfortable and indicated that they initiated CoC with their patients. These findings do not support previous studies that found providers often have difficulty initiating CoC conversations with their patients (Alexander et al., 2004; Erwin et al., 2019; Schrag et al., 2007).

Health care providers in this study were concerned that they did not have enough knowledge or resources to address the financial burdens facing their patients adequately. These findings are consistent with previous research that has shown health care providers have some degree of comfort with CoC conversations, but often providers do not know the cost of prescribed treatments (Bethke et al., 2020).

Given the fast pace of electronic media and access to the internet, it was surprising to learn that most health care providers preferred a written fact sheet to assist with CoC conversations. In contrast, patients wanted to learn about CoC conversations from their health care providers directly, followed by written materials. Research on patient education has suggested that

providers need to match the preferred learning style of their patients to explore both high-tech and low-tech education options (Bukstein, 2016).

Limitations

There were some limitations to this study. These were convenience samples of older adults and health care providers with the purpose of informing the development of cost-of-care educational materials. Therefore, it is not possible to generalize results to the entire population of older adults and health care providers in rural Appalachian communities. The sample of older adults identified almost exclusively as white which reflects the racial demographics for these communities but limits the findings for diverse groups. Additionally, the largest group of respondents to the health care provider survey was nurses; therefore, we cannot generalize these findings to all health care providers' preferences and opinions.

Implications for Extension

Extension's contribution to rural health and well-being was acknowledged internally as early as the 1970s (Konyha, 1975; Wang, 1974; Yep, 1975). While some programs connecting Extension with the healthcare delivery system have experienced success (Tiret et al., 2019), Extension has continued to experience difficulty obtaining recognition in the health care and public health sectors (Buys & Rennekamp, 2020; Halpert & Sharp, 1991; Khan et al., 2020). Calls for Extension linkages with clinical partners have cited the value for improved health outcomes, particularly for rural audiences where access to health care is often limited (Bigbee et al., 2009; Dwyer et al., 2017; Grumbach & Mold, 2009). The role of health professionals and clinical and community preventive services was noted in Cooperative Extension's National Framework for Health and Wellness, a tool guiding Extension efforts to systematically address health at multiple levels (Braun et al., 2014). Health services are a component of the updated framework, Cooperative Extension's National Framework for Healthy Equity and Well-Being (Burton et al., 2021). Findings reported here highlight an area for strengthened linkages between community-based Extension outreach and the health care sector to educate and support patients and potentially improve health outcomes. Barriers to CoC conversations identified for both patients and providers clearly highlight areas for Extension intervention and point to potential expansion of partnership with the health care sector.

Published literature describing Extension collaborations with the health care sector is few but cites the importance of Extension working with healthcare professionals on health issues and the growing recognition that these collaborations need to expand (Koukel et al., 2018; Remley et al., 2018). Published studies describing Extension collaboration with community health nurses and academic nursing programs leveraged Extension primarily for research activities, such as participant recruitment and data collection, or as an internship site for students in health fields, not as a partner in providing community education (Condo & Martin, 2002; Gray, 1990; Hall et al., 2005). These types of joint activities, while valuable, overlook a key strength of Extension to

educate and engage communities. The study reported here required a lens shift to view Extension educational programs through a complementary clinical-community context. Findings are informative for program development with an aim for mutual benefit.

Nearly half of health care provider respondents for survey findings reported here were nurses. Extension partnerships with this group of health care professionals could be a path forward for other health care/Extension partnerships. This includes the need for models connecting primary care to community-based education provided through Extension. One successful example is fruit and vegetable prescription programs, where physicians prescribe produce for patients and collaborate with Extension to provide nutrition education to encourage increased consumption (Tiret et al., 2019). Scaling up successful programs, as well as encouraging and strengthening collaborations between Extension and healthcare professionals, provides continued opportunities to improve healthcare outcomes for communities.

References

- Alexander, G. C., Casalino, L. P., Tseng, C., McFadden, D., & Meltzer, D. O. (2004). Barriers to patient-physician communication about out-of-pocket costs. *Journal of General Internal Medicine*, 19(8), 856–860. <https://doi.org/10.1111/j.1525-1497.2004.30249.x>
- Benedetti, N. J., Fung, V., Reed, M., Price, M., Brand, R., Newhouse, J. P., & Hsu, J. (2008). Office visit copayments: Patient knowledge, response, and communication with providers. *Medical Care*, 46(4), 403–409. <https://doi.org/10.1097/MLR.0b013e31815c3192>
- Bethke, M., Gordon, R., Elsner, N., & Varia, H. (2020, October). *Equipping physicians for value-based care*. Deloitte Insights. <https://www2.deloitte.com/us/en/insights/industry/health-care/physicians-guide-value-based-care-trends.html>
- Bigbee, J. L., Hampton, C., Blanford, D., & Ketner, P. (2009). Community health nursing and Cooperative Extension: A natural partnership. *Journal of Community Health Nursing*, 26(4), 192–197. <https://doi.org/10.1080/07370010903259303>
- Braun, B., Bruns, K., Cronk, L., Kirk Fox, L., Koukel, S., Le Menestrel, S., Lord, L. M., Reeves, C., Rennekamp, R., Rice, C., Rodgers, M., Samuel, J., Vail, A., & Warren, T. (2014). *Cooperative Extension's National Framework for Health and Wellness*. Extension Committee on Organization and Practice (ECOP). https://www.nifa.usda.gov/sites/default/files/resource/Cooperative_extensionNationalFrameworkHealth.pdf
- Brick, D. J., Scherr, K. A., & Ubel, P. A. (2019). The impact of cost conversations on the patient-physician relationship. *Health Communication*, 34(1), 65–73. <https://doi.org/10.1080/10410236.2017.1384428>
- Bukstein, D. A. (2016). Patient adherence and effective communication. *Annals of Allergy, Asthma & Immunology*, 117(6), 613–619. <https://doi.org/10.1016/j.anai.2016.08.029>

- Burton, D., Canto, A., Coon, T., Eschbach, C., Gutter, M., Jones, M., Kennedy, L., Martin, K., Mitchell, A., O'Neal, L., Rennekamp, R., Rodgers, M., Stluka, S., Trautman, K., Yelland, E., & York, D. (2021). *Cooperative Extension's National Framework for Health Equity and Well-Being*. Extension Committee on Organization and Practice Health Innovation Task Force. <https://www.aplu.org/wp-content/uploads/202120EquityHealth20Sum.pdf>
- Buys, D. R., & Rennekamp, R. (2020). Cooperative Extension as a force for healthy rural communities: Historical perspectives and future directions. *American Journal of Public Health, 110*(9), 1300–1303. <https://doi.org/10.2105/AJPH.2020.305767>
- Condo, E. P., & Martin, K. E. (2002). Health professions and Cooperative Extension: An emerging partnership. *Journal of Extension, 40*(4). <https://archives.joe.org/joe/2002august/a2.php>
- Cook, K., Dranove, D., & Sfekas, A. (2010). Does major illness cause financial catastrophe? *Health Services Research, 45*(2), 418–436. <https://doi.org/10.1111/j.1475-6773.2009.01049.x>
- Cromartie, J. (2021). *Rural aging occurs in different places for very different reasons*. USDA Economic Research Service. <https://www.usda.gov/media/blog/2018/12/20/rural-aging-occurs-different-places-very-different-reasons>
- Cubanski, J., Koma, W., Damico, A., & Neuman, T. (2019). *How much do Medicare beneficiaries spend out of pocket on health care?* Henry J. Kaiser Family Foundation. <https://www.kff.org/medicare/issue-brief/how-much-do-medicare-beneficiaries-spend-out-of-pocket-on-health-care/>
- Dine, C. J., Masi, D., & Smith, C. D. (2019). Tools to help overcome barriers to cost-of-care conversations. *Annals of Internal Medicine, 170*(9_Supplement), S36–S38. <https://doi.org/10.7326/M19-0778>
- Dwyer, J. W., Contreras, D., Eschbach, C., Tired, H., Newkirk, C., Carter, E., & Cronk, L. (2017). Cooperative Extension as a framework for health extension: The Michigan State University model. *Academic Medicine, 92*(10), 1416–1420. <https://doi.org/10.1097%2FACM.0000000000001640>
- Erwin, K., Fitzpatrick, V., Gill, L., Perez, S., Sammen, J., Gomez-Rexrode, A., Masi, D., Seidman, J., & Steinberg, K. (2018). Considerations for facilitating cost-of-care conversations with vulnerable patients (Cost-of-care Conversations Practice Brief #6). Robert Wood Johnson Foundation. <https://essentialhospitals.org/wp-content/uploads/2018/11/CostofCarePracticeBrief6.pdf>
- Erwin, K., Firzpatrick, V., Norell, S., & Gilliam, M. (2019). Development of a framework and tool to facilitate cost-of-care conversations with patients during prenatal care. *Annals of Internal Medicine, 170*(9_Supplement), S62–S69. <https://doi.org/10.7326/M18-2207>
- Gray, M. E. (1990). Factors related to practice of breast self-examination in rural women. *Cancer Nursing, 13*(2), 100–107. PMID: 2331690

- Grumbach, K., & Mold, J. W. (2009). A health care Cooperative Extension Service: Transforming primary care and community health. *Journal of the American Medical Association*, 301(24), 2589–2591. <https://doi.org/10.1001/jama.2009.923>
- Hall, C. P., Wimberley, P. D., Hall, J. D., Pfriemer, J. T., Hubbard, E., Stacy, A. S., & Gilbert, J. D. (2005). Teaching breast cancer screening to African American women in the Arkansas Mississippi river delta. *Oncology Nursing Forum*, 32(4), 857–863. <https://doi.org/10.1188/05.ONF.857-863>
- Halpert, B. P., & Sharp, T. S. (1991). Utilizing Cooperative Extension Services to meet rural health needs. *The Journal of Rural Health*, 7(1), 23–29. <https://doi.org/10.1111/j.1748-0361.1991.tb00700.x>
- Henrikson, N. B., Banegas, M. P., Tuzzio, L., Lim, C., Schneider, J. L., Walsh-Bailey, C., Scrol, A., & Hodge, S. M. (2019). Workflow requirements for cost-of-care conversations in outpatient settings providing oncology or primary care: A qualitative, human-centered design study. *Annals of Internal Medicine*, 170(9_Supplement), S70–S78. <https://doi.org/10.7326/M18-2227>
- Hunter, W. G., Zafar, S. Y., Hesson, A., Davis, J. K., Kirby, C., Barnett, J. A., & Ubel, P. A. (2017). Discussing health care expenses in the oncology clinic: Analysis of cost conversations in outpatient encounters. *Journal of Oncology Practice*, 13(11), e944–e953. <https://doi.org/10.1200/JOP.2017.022855>
- Kaye, N., & Long, K. (2021). *Toolkit: State strategies to support older adults aging in place in rural areas*. National Academy for State Health Policy. <https://www.nashp.org/toolkit-state-strategies-to-support-older-adults-aging-in-place-in-rural-areas/>
- Keehan, S. P., Stone, D. A., Poisal, J. A., Cuckler, G. A., Sisko, A. M., Smith, S. D., Madison, A. J., Wolfe, C. J., & Lizonitz, J. M. (2017). National health expenditure projections, 2016–2025: Price increases, aging push sector to 20 percent of economy. *Health Affairs*, 36(3), 553–563. <https://doi.org/10.1377/hlthaff.2016.1627>
- Khan, T., Eschbach, C., Cuthbertson, C. A., Newkirk, C., Contreras, D., & Kirley, K. (2020). Connecting primary care to community-based education: Michigan physicians' familiarity with Extension programs. *Health Promotion Practice*, 21(2), 175–180. <https://doi.org/10.1177/1524839919868980>
- Kluender, R., Mahoney, N., Wong, F., & Yin, W. (2021). Medical debt in the US, 2009-2020. *Journal of the American Medical Association*, 326(3), 250–256. <https://doi.org/10.1001/jama.2021.8694>
- Konyha, M. E. (1975). Cooperative Extension Service's potential to meet the needs in rural health education and in rural institutional development. *Public Health Reports*, 90(4), 340–343. PMID: 898820
- Koukel, S., Newkirk, C., Bercaw, S., Letto, B., & Malekian, F. (2018). Cooperative Extension and health literacy: A national focus. *Journal of Human Sciences and Extension*, 6(2), 71–80. <https://doi.org/10.54718/SDQT2426>

- Pender, J., Hertz, T., Cromartie, J., & Farrigan, T. (2019). *Rural America at a glance, 2019 edition*. U.S. Department of Agriculture. <https://www.ers.usda.gov/publications/pub-details/?pubid=95340>
- Perez, S. L., Weissman, A., Read, S., Smith, C. D., Colello, L., Peter, D., & Nickel, W. (2019). US internists' perspectives on discussing cost of care with patients: Structured interviews and a survey. *Annals of Internal Medicine*, 170(9_Supplement), S39–S45. <https://doi.org/10.7326/M18-2136>
- Piette, J. D., Heisler, M., Krein, S., & Kerr, E. A. (2005). The role of patient-physician trust in moderating medication nonadherence due to cost pressures. *Archives of Internal Medicine*, 165(15), 1749–1755. <https://doi.org/10.1001/archinte.165.15.1749>
- Pooler, J., Liu, S., & Roberts, A. (2017). *Older adults and unmet social needs: Prevalence and health implications*. AARP Foundation IMPAQ International. https://endseniorhunger.aarp.org/wp-content/uploads/2017/11/SDOH-among-older-adults-2017_IssueBrief_COR-Final.pdf
- Remley, D., Buys, D., Cronk, L., Duffy, V., Garden-Robinson, J., Horowitz, M., McGee, B., Nelson, C., Prevedel, S. M., Reicks, M., & Warren, T. (2018). The role of Cooperative Extension in chronic disease prevention and management: Perspectives from professionals in the field. *Journal of Human Sciences and Extension*, 6(2), 15–25. <https://doi.org/10.54718/OSZB3038>
- Richman, I. B., & Brodie, M. (2014). A national study of burdensome health care costs among non-elderly Americans. *BMC Health Services Research*, 14(1), 1–7. <http://www.biomedcentral.com/1472-6963/14/435>
- Schrag, D., & Hanger, M. (2007). Medical oncologists' views on communicating with patients about chemotherapy costs: A pilot survey. *Journal of Clinical Oncology*, 25(2), 233–237. <https://doi.org/10.1200/JCO.2006.09.2437>
- Sloan, C. E., & Ubel, P. A. (2019). The 7 habits of highly effective cost-of-care conversations. *Annals of Internal Medicine*, 170(9_Supplement), S33–S35. <https://doi.org/10.7326/M19-0537>
- Tiret, H., Eschbach, C., & Newkirk, C. (2019). Rx for Health Referral Toolkit to promote Extension programs. *Journal of Health Sciences & Extension*, 7(3), 173–185. <https://doi.org/10.54718/JOQB8742>
- Wang, V. L. (1974). Using Cooperative Extension programs for health education. *Health Education*, 64(2), 107–111. <https://ajph.aphapublications.org/doi/pdfplus/10.2105/AJPH.64.2.107>
- Yep, B. (1975). A framework for the study of the role of Cooperative Extension Service in the health field. *Health Education Monographs*, 3(1), 31–40. <https://doi.org/10.1177/109019817500300105>

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Acknowledgments

This work is supported by the Rural Health and Safety Education Competitive Grants Program grant no. 2020-46100-32838 from the USDA National Institute of Food and Agriculture. The authors want to acknowledge the assistance of the Extension Family and Consumer Science agents in the five counties and the health care providers and community members who assisted with this project.

Academic Performance of Texas 4-H Alumni

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Academic achievement is one of the central outcomes targeted by all major models of youth development. Youth who succeed academically are well-positioned to thrive through meaningful careers, positions of community leadership, and fulfilling personal and family lives (Arnold, 2018). As such, the Texas Higher Education Coordinating Board (THECB) has established a set of ambitious goals for the postsecondary education of Texas youth. Almost in tandem with the establishment of these goals, outcomes of academic achievement in relation to membership in Texas 4-H have become a keen interest for stakeholders. Through our study, we compared postsecondary academic achievement of Texas 4-H Alumni who graduated from high school in 2013, 2014, and 2015 against the Texas population. Data sources included the National Student Clearinghouse (NSC), the THECB, and an online survey. Results found that Texas 4-H alumni substantially outperformed the population of Texas higher education students on completion rates, baccalaureate graduation rates, marketable skills, student debt, ACT scores, and dual credit enrollment. To provide further direction and context, opportunities for Texas 4-H to build upon this success are provided in the recommendations section.

Keywords: 4-H, impact, postsecondary academic success, college preparation, marketable skills, youth development

Introduction

The Texas Higher Education Coordinating Board (THECB) has established a set of challenging yet attainable goals for postsecondary education students. Its 60x30TX program defines four specific goals vital to the future of the state: attainment of certificates and degrees, timely completion rates, development of marketable skills, and minimizing student debt (THECB, 2020). According to THECB, “a more educated workforce leads to innovation and expansion and more economic opportunities” for the state of Texas (THECB, 2020). The postsecondary academic success of Texas students is likely impacted by both formal education and out-of-

school time (OST) programs (Ratkos & Knollenberg, 2015; Witt & Caldwell, 2018). Involvement in positive OST programs is known to lead to a variety of developmental outcomes, such as decreased failure and dropout rates, reduced school absences, increased academic achievement, and increased rates of enrollment in postsecondary education (e.g., Mahoney et al., 2005). As such, we compared the postsecondary academic success of Texas 4-H alumni to that of the overall population of Texas.

Context: 4-H and Academic Success

Texas 4-H is the youth-serving component of the Texas University System, the Texas Extension Service, and the Prairie View Cooperative Extension Program. Through the network of Extension agents and volunteers, the 4-H program is accessible to youth in all 254 counties through 250 county Extension offices. In 2018, enrollment in Texas 4-H reached 496,849 youth: 39% from cities, 32% from towns/suburbs, and 29% from rural communities. Youth in grades 3–5 made up the largest group, with 44% of youth reached, followed by 31% from kindergarten to 2nd grade, 13% from grades 6–8, and 12% from grades 9–12 (Texas 4-H, 2023). Ranging from robots to rabbits, Texas 4-H offers life-skill-gaining experiences to youth from kindergarten to 12th grade, preparing them for adulthood.

As the largest youth-serving organization in Texas, Texas 4-H has notable potential to impact success. Since 1908, youth involved in Texas 4-H have gained life skills through hands-on activities supported by caring adults. The longevity of Texas 4-H has resulted in a long history of cultivating and developing positive outcomes (Texas 4-H, 2023). Texas 4-H's OST, community-centered approach is assumed to facilitate developmental outcomes for youth that promote academic success (Arnold et al., 2016; Borden et al., 2014; Lerner & Lerner, 2013; Ratkos & Knollenberg, 2015) and is sustained through adulthood.

Academic success is among the developmental outcomes targeted by youth development frameworks, including (1) targeting life skills (Hendricks, 1996), (2) essential elements (Kress, 2005), and (3) developmental assets (Search Institute, 1997, 2007). While these frameworks slightly differ on anticipated outcomes, they all emphasize the positive impact the integration of these frameworks can have within OST involvement. Within the context of this study, success refers to the accomplishment of a valued goal. It is important to note that academic success and related outcomes are fostered both in-school and out-of-school settings. The literature surrounding the academic development of adolescents within school settings is vast and of a different nature. In this context, the in-school-time literature revolves around a particular school's culture, standardized testing, and educational gaps between and among special populations (Lindholm-Leary & Borsato, 2006; MacNeil et al., 2009; York et al., 2019).

Study Objectives

For the purposes of this study, we addressed and evaluated the academic performance of 4-H alumni according to goals for Texas higher education established by THECB (THECB, 2020).

1. Do Texas 4-H alumni perform better academically than the population of Texas postsecondary education students, with respect to the four THECB 60x30 goals:
 - a. 60x30 educated population (certificate or degree completion rates)?
 - b. Four-year baccalaureate degree graduation rates?
 - c. Marketable skills (gainfully employed or in graduate school)?
 - d. Debt per first-year wages (debt as a ratio to first-year income)?
2. Are Texas 4-H alumni better prepared for postsecondary education entry than the population of Texas higher education students?
 - a. Do Texas 4-H alumni have higher ACT scores at entry?
 - b. Do Texas 4-H alumni have higher levels of dual credit enrollment?

Method

Populations

Populations included (a) all students who graduated from Texas high schools between 2013 and 2015 and (b) 4-H alumni who graduated during the same years (two or more years of membership). Data for the first group were retrieved from the THECB databases. Data for the latter group were purchased from the National Student Clearinghouse (NSC).

A subset was comprised of 4-H alumni who had received scholarships administered by the Texas 4-H Foundation. Annually, the Texas 4-H Foundation awards \$2.5 million dollars in scholarships to over 200 graduating high school seniors. Scholarships are awarded based on an applicant's academic record, 4-H experience, and financial need.

We also surveyed 4-H alumni from the same graduation years to supplement data not available from the NSC. The sampling frame was assembled from email lists of all Texas 4-H alumni who graduated high school in 2013–2015. We sent questionnaires and reminders to this sample and specific email lists maintained by Texas 4-H.

Data Sources

THECB and its 60x30 Educated Population Goals

Established by the Texas Legislature in 1965, the THECB represents the highest authority in the state on matters of public higher education (THECB, 2023). The THECB's recent establishment of the "60x30TX" initiative provided the framework for our study. THECB also provided data

allowing us to compare the academic and professional success of Texas 4-H alumni with the overall population of Texas students. Under the 60x30TX plan, the THECB aspires to achieve a status in which 60% of Texas residents between the ages of 25–34 have earned a postsecondary credential by the year 2030. The 60x30TX initiative also establishes that 550,000 students in 2030 will complete a certificate or degree from a Texas college or university, graduates will have marketable skills, and a student's debt at graduation will be less than 60% of their first-year wages.

NSC

NSC is the nation's "leading provider of educational reporting, data exchange, verification, and research services" (National Student Clearinghouse, 2023, para. 1). NSC is a not-for-profit, non-governmental organization. It was founded in 1993 by the nation's higher education community. The NSC Research Center (National Student Clearinghouse Research Center, 2023) maintains a StudentTracker database of nationwide enrollment records and accompanying data showing the completion of postsecondary certificates and degrees. We secured 4,259 4-H alumni records, including 566 4-H scholars from the high school graduation years of 2013–2015.

Supplemental Questionnaire

The NSC data did not include records needed to evaluate select facets of the academic performance of 4-H alumni: ACT scores, student debt, dual credit enrollment, and marketable skills. Thus, we conducted a supplemental survey of 4-H alumni. The questionnaire included 19 questions and was administered through an online Qualtrics application. Questions fell under the categories of basic information, academic performance, and preparation. Skip logic was used to ensure appropriate questions were answered by each participant. Twelve questions were multiple choice, and the remaining seven were slider scales. The questionnaire link was distributed by the Texas 4-H office. We received responses from 719 4-H alumni, including 201 4-H scholars.

Data Analysis

Data management strategies (i.e., extracting relevant data and aggregating NSC data per student) were used to organize the data into formats necessary for analysis. Data were then cleaned by evaluating central tendency, dispersion, and shape of distributions. Visual displays of data were constructed to facilitate a comparison of the academic performance of the population of Texas students with the 4-H alumni and 4-H alumni who were recipients of the major Texas 4-H Foundation scholarships. We calculated 95% confidence intervals (CI) for each subgroup (i.e., 4-H alumni and 4-H scholars) to facilitate comparison among the three groups (THECB population, 4-H alumni, and 4-H scholars).

Results

60x30TX Goal 1: Do Texas 4-H alumni perform better academically than the population of Texas postsecondary education students?

Figure 1 contrasts the Texas population with 4-H alumni and scholars on a four-year completion rate for a certificate or a degree. The progressive target established by THECB for this cohort is shown as a horizontal line. In order to achieve the 60x30TX goal, THECB projected that this cohort should achieve a completion rate of 45%. As Figure 1 shows, the population of Texas students fell slightly below the progressive target, 43.6% (3% below the progressive target). In contrast, the rate of success of 4-H alumni and 4-H alumni scholars substantially exceeded the progressive target: 78% completion (73% above the progressive target) and 88.8% completion (97% above the progressive target) for 4-H alumni and 4-H scholars, respectively. Thus, our data suggest that 4-H alumni and 4-H scholars perform much better than the overall population of Texas students.

Figure 1. Four-Year Completion Rate (2013–2015)

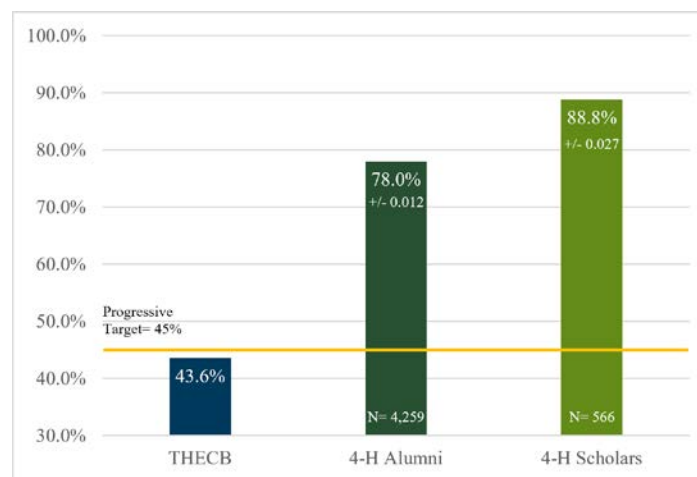


Figure 2 contrasts the Texas population with 4-H alumni and scholars on a five-year completion rate for a certificate or a degree. The THECB progressive target is increased to 46.4% for the five-year completion rate. Figure 2 shows the statewide population falling below the target at 43.7% (6% below the progressive target). In contrast, the 4-H alumni and 4-H alumni scholars are achieving a five-year completion rate of 95.2% (105% above the progressive target) and 97.4% (110% above the progressive target), respectively. Results, then, indicate that 4-H alumni and 4-H scholars have a much higher five-year completion rate than the overall population, as reported by THECB.

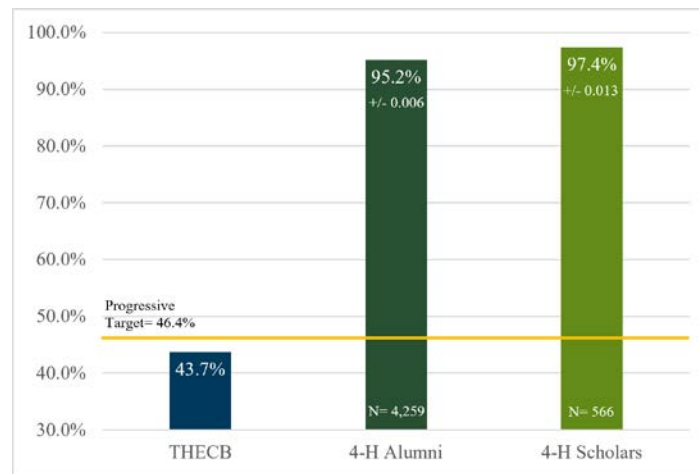
Figure 2. Five-Year Completion Rate (2013-2015)

Figure 3 compares four-year graduation rates for a baccalaureate degree. Almost 39% of the Texas population is completing a baccalaureate degree in four years. 4-H alumni are performing much better. Eighty-three percent of 4-H alumni and 89.8% of 4-H alumni scholars are graduating with baccalaureate degrees in four years.

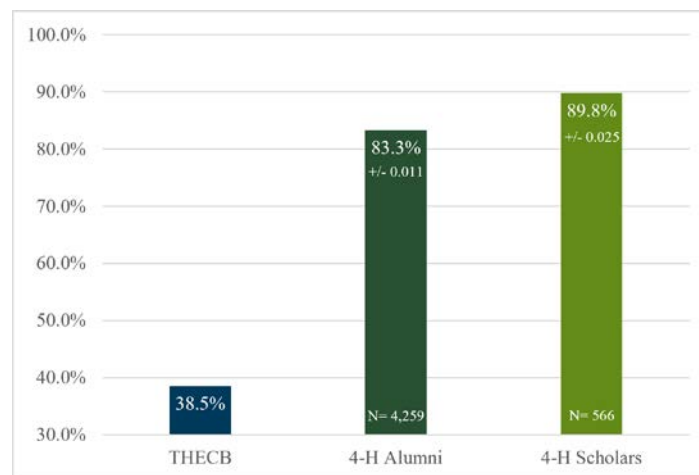
Figure 3. Four-Year Graduation Rate for a Baccalaureate Degree (2013-2015)

Figure 4 compares the acquisition of marketable skills. THECB defines marketable skills as being either enrolled in graduate school or employed one year following graduation with a certificate or a degree. The progressive target established by THECB for this metric is 100%, shown as a horizontal line in Figure 4. 4-H alumni who graduated from postsecondary education developed marketable skills at a rate of 98% (2% below the target), and 4-H alumni scholars developed those skills at a rate of 98.1% (1.9% below the target). The Texas population rate was 78.5% (22% below the target). None of the three groups are achieving the target of 100% marketable skills, but 4-H alumni and 4-H scholars are developing marketable skills at a higher rate than the overall population of Texas students.

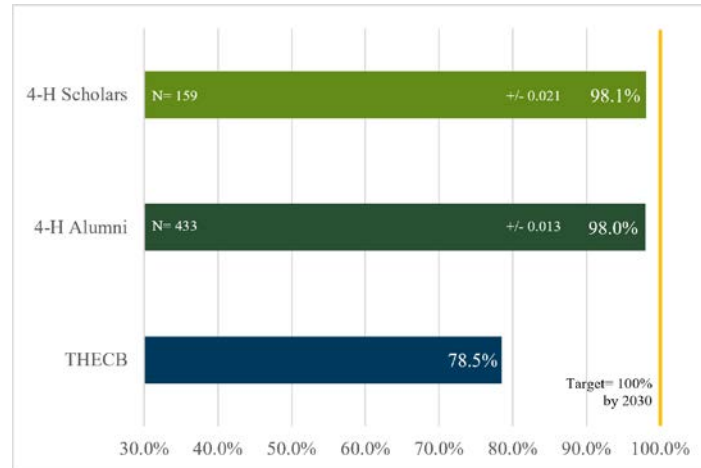
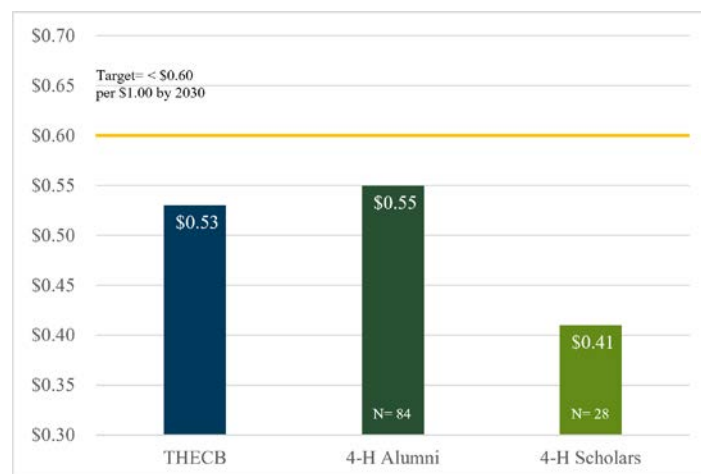
Figure 4. Development of Marketable Skills (2013-2015)

Figure 5 contrasts the Texas population with 4-H alumni and scholars on the average ratio of student loan debt to first-year gross income. For this metric, only high school graduates from 2013 were evaluated because data for other years were not available. The progressive target established by THECB for this metric is \$0.60 cents, shown as the horizontal line in Figure 5. All three populations are already under the target line for this metric, with \$0.53 for the Texas population and \$0.55 (95% CI [.39, .72]) and \$0.41 [.14, .67] for 4-H alumni and 4-H alumni scholars, respectively. Thus, although the mean debt ratios for 4-H alumni and scholars are less than the Texas population, these means do not differ significantly from the population mean. It is important to note that CIs are greatly influenced by the sample size. In this analysis, sample sizes were only $n = 84$ and $n = 28$ for 4-H alumni and scholars, respectively. The large range between the upper and lower limits of a CI is an empirical certainty when sample sizes are small.

Figure 5. Average Ratio of Debt to First-Year Income (2013)

Are Texas 4-H alumni better prepared for postsecondary education entry than the population of Texas higher education students?

In addition to the goals of THECB's 60x30TX, we evaluated ACT scores and enrollment in dual credit to compare preparation for postsecondary achievement. Questionnaire participants reported ACT scores based on recollection. In order to help participants recall their scores, the components of the test, scoring range, and average ACT score for Texas Residents in 2015 were provided. The question regarding dual credit was a simple yes or no question, consistent with the way dual credit is reported by THECB.

Figure 6 contrasts the Texas population with 4-H alumni and scholars on ACT scores. In 2015 for the state of Texas, the average ACT score was 20.9. Possible scores range from 1–36. The mean ACT scores of 4-H alumni were higher: 24.59 for 4-H alumni and 26.59 for 4-H scholars. It is important to note that the sample sizes were small ($n = 399$ for 4-H alumni; $n = 133$ for 4-H scholars). With these sample sizes, the 95% CI for ACT means were 24.12 to 25.07 for 4-H alumni and 25.88 to 27.31 for 4-H scholars. Thus, both 4-H alumni and 4-H scholars scored significantly higher than the Texas population on the ACT.

Figure 6. Composite ACT Scores (2013-2015)

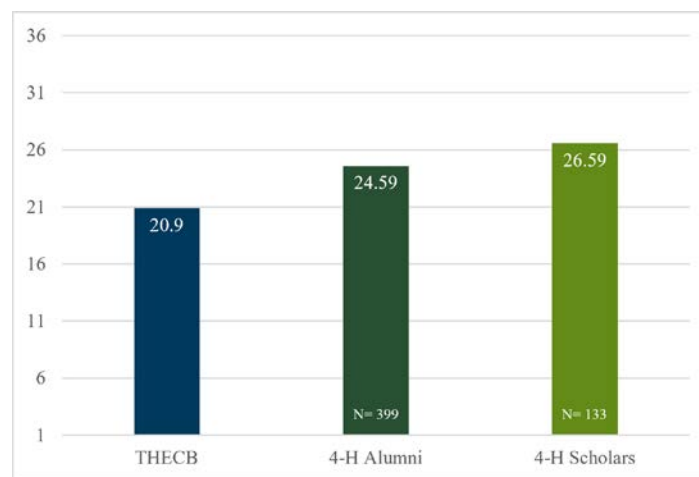
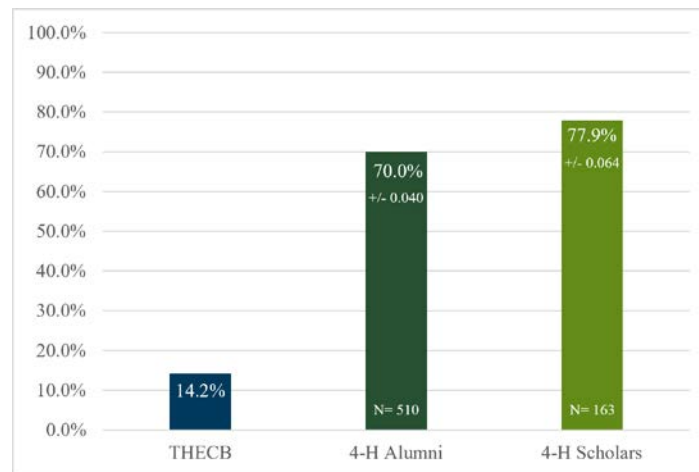


Figure 7 shows the percentage of dual credit enrollment. Although THECB 60x30TX priorities do not include an explicit goal for four or five-year completion, THECB monitors graduation rates and considers efficient completion of degrees to be very important. Fourteen percent of the Texas population enrolled in dual credit courses. Enrollment of 4-H alumni and 4-H scholars was much higher at 70% and 77.9%, respectively. Earning dual credit accelerates progress toward degrees and thereby advances the efficiency of the higher education system.

Figure 7. Percent of Students Enrolled in Dual Credit (2013-2015)

Discussion

Results consistently indicate that 4-H alumni and 4-H scholars are succeeding in postsecondary education at rates substantially exceeding the overall Texas population. Perhaps the most dramatic difference is in the four-year completion of a certificate or degree. THECB established a progressive target of 45% for the years for which data are available. The population of Texas postsecondary students fell slightly short of that goal, 43.6%. In contrast, both 4-H alumni and 4-H scholars substantially exceeded that goal, 78% and 88.8%, respectively. Differences were similarly dramatic for 5-year completion rates and for rates of completion of baccalaureate degrees. Both 4-H populations also performed better in acquiring marketable skills. Scholarships funded by the 4-H Foundation yield graduates less burdened with student loan debt. 4-H alumni and 4-H scholars score significantly higher on the ACT than Texas students overall.

Consistent with existing literature, within the substantial limits of attributing causation from correlational research, findings from our study support the notion that involvement in positive OST programs impacts developmental outcomes relating to academic motivation and success.

Similar results have been reported. In their study of preparation for postsecondary education, Ratkos and Knollenberg (2015) found “4-H can help meet the need of preparing students to navigate the demands, challenges, and rigor of college life.” Likewise, Hetherington (2020) found that Michigan 4-H alumni are more likely to have earned a college degree six years after high school than their same-age peers.

Limitations are notable. Data on completion rates for certificates or degrees were obtained from well-established sources widely used for policy decisions, but analyses involving ACT scores, dual credit, and debt-to-first-year income required a new self-report questionnaire of 4-H alumni. The precision of our measures is largely impacted by the accuracy of the memories of participants who were asked to recall information from several years previous. It is not clear if

people could accurately recall an ACT score from an exam completed as many as seven years earlier. Also, it is notable that not all postsecondary institutions report data to NSC. Thus, parameters based on NSC data are calculated from the universities that do report to NSC.

Recommendations for Practice

This research informs management action. For Texas 4-H, the following actions indicate appropriate initiatives.

1. Establish and manage in-house goals for 4-year and 5-year graduation rates, debt ratios, ACT scores, and dual-credit enrollment for 4-H members.
2. Develop curricula and train-the-trainer programs for 4-H alumni to address debt to first-year income ratios.
3. Create a 4-H alumni database to maintain up-to-date contact information. The management of this database would assist in improving response rates for future research.
4. Conduct research to determine the influence degree of engagement in 4-H (e.g., length of time, type of involvement, and program quality) has on academic preparation, postsecondary success, and marketable skills.

References

- Arnold, M. (2018). From context to outcomes: Adolescent thriving in 4-H youth development programs. *Journal of Human Sciences and Extension*, 6(1), 141–160.
<https://doi.org/10.54718/NBNL5438>
- Arnold, M., Silliman, B., Bledsoe, L., Diaz, L., Johnson, J., Lauxman, L., & White, D. (2016). *4-H Program Quality and Accountability Taskforce PYD Frameworks Committee final report* [Unpublished manuscript].
- Borden, L. M., Perkins, D. F., & Hawkey, K. (2014). 4-H youth development: The past, the present, and the future. *Journal of Extension*, 52(4), Article 35.
<https://tigerprints.clemson.edu/joe/vol52/iss4/35>
- Hendricks, P. (1996). *Targeting life skills model*. Iowa State University Extension.
- Hetherington, C. (2020). *Michigan 4-H Alumni College Access Project: 2019 results*. Michigan State University Extension.
https://www.canr.msu.edu/4h/uploads/files/College%20Access%20Report_2019_fixed.pdf
- Kress, C. (2005). Essential elements of positive youth development. In *Strengthening positive youth development environments* (pp. 20–23). University of Wisconsin Extension 4-H Program.
- Lerner, R. M., & Lerner, J. V. (2013). *The positive development of youth: Comprehensive findings from the 4-H study of positive youth development*. National 4-H Council.

- Lindholm-Leary, K., & Borsato, G. (2006). Academic achievement. In F. Genesee, K. Lindholm-Leary, W. M. Saunders, & D. Christian (Eds.), *Educating English language learners: A synthesis of research evidence* (pp. 176–222). Cambridge University Press.
- MacNeil, A. J., Prater, D. L., & Busch, S. (2009). The effects of school culture and climate on student achievement. *International Journal of Leadership in Education*, 12(1), 73–84. <https://doi.org/10.1080/13603120701576241>
- Mahoney, J. L., Larson, R. W., Eccles, J. S., & Lord, H. (2005). Organized activities as development contexts for children and adolescents. In J. Mahoney, R. Larson, & J. Eccles (Eds.), *Organized activities as contexts for development: Extracurricular activities, after-school and community programs* (pp. 3–22). Lawrence Erlbaum Associates.
- National Student Clearinghouse. (2023). *About the Clearinghouse*. <https://www.studentclearinghouse.org/about/>
- National Student Clearinghouse Research Center. (2023). *About us*. <https://nscresearchcenter.org/aboutus/>
- Ratkos, J., & Knollenberg, L. (2015). College transition study shows 4-H helps youth prepare for and succeed in college. *Journal of Extension*, 53(4), Article 24. <https://doi.org/10.34068/joe.53.04.24>
- Search Institute. (1997). *40 developmental assets for adolescents (ages 12-18)*. Search Institute.
- Search Institute. (2007). *40 developmental assets for adolescents (ages 12-18)*. Search Institute.
- Texas 4-H. (2023). *About Texas 4-H*. <https://texas4-h.tamu.edu/about/what-is-4-h/>
- Texas Higher Education Coordinating Board. (2020). *2015-2030 Texas higher education plan, 60x30TX*. <https://reportcenter.highered.texas.gov/agency-publication/miscellaneous/thecb-60x30-strategic-plan/>
- Texas Higher Education Coordinating Board. (2023). <https://www.highered.texas.gov/>
- Witt, P. A., & Caldwell, L. (Eds.). (2018). *Youth development: Principles and practices in out-of-school time settings*. Sagamore-Venture.
- York, T. T., Gibson, C., & Rankin, S. (2019). Defining and measuring academic success. *Practical Assessment, Research, and Evaluation*, 20(1), Article 5. <https://doi.org/10.7275/hz5x-tx03>

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A Case Study Comparing the Life Skills Development and Knowledge in Youth Participants of Horseless and Traditional Horse Programs in Utah

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This study compared four horseless and seven traditional horse participants from Washington County 4-H in Utah for horse knowledge gained and for the development of 10 life skills from Hendricks's Targeting Life Skills Model: leadership, teamwork, self-responsibility, personal safety, problem-solving, decision-making, critical thinking, goal setting, communication, and concern for others. This study's mixed methods design employed interviews to learn about life skill development and quantitative data from a 20-item horse knowledge quiz and demographic survey. The traditional horse youth showed greater development of leadership, self-responsibility, decision-making, goal setting, and communication than the horseless youth. Roughly half of the participants in both groups experienced having concern for others in their program, but both programs lacked the development of critical thinking and problem-solving. As for horse knowledge, traditional horse participant scores were 15% to 40% better than horseless participants. The horseless participants lacked knowledge on the parts of a western saddle and horsemanship. Recommendations for future research include observational research in addition to participants' self-perceived data, perspectives of the adult leaders, and pre-post test data to track the growth of life skills and horse knowledge in horseless and traditional horse participants.

Keywords: mixed-method, life skills, horse knowledge, 4-H, horse program

Introduction

Research has documented a major shift in Extension due to urbanization of the United States (Brandon et al., 2018). As more urban and suburban communities form, Utah 4-H is offering new clubs to more urban youth, including dog clubs, shooting sports clubs, and horseless horse programs (B. Scow, personal communication, October 25, 2018). These clubs offer youth new opportunities in which to practice life skills, foster citizenship, and promote leadership opportunities while maintaining a commitment to the 4-H mission and tradition. Washington County Utah 4-H Needs Assessment Committee examined the county's decreasing traditional horse program enrollment. Changing demographics, socioeconomics, and land developments contributed to more horseless youth. Thus the 4-H county agent created a horseless horse

program in 2018 (Scow & Johnson, 2018). Horseless horse programs are designed for 4-H youth members who do not lease or own horses (Washington State University Extension & US Department of Agriculture, 2003). Animal ownership, care, and riding are not required to participate in horseless horse programs.

The development of life skills and knowledge in youth is a primary goal of 4-H horse programming. Research shows that youth programs, including 4-H, that emphasize horse topics such as horsemanship, safety, health management, and nutrition help to develop life skills such as decision-making, communicating, goal setting, thinking, and problem-solving in youth (Smith et al., 2006). Traditional 4-H horse clubs are intended to develop life skills and knowledge in youth who participate, but the benefits of life skills and horse knowledge developed from the traditionally mounted 4-H horse programs are only accessible to youth who have regular access to horses through ownership or lease.

4-H horseless horse programs can be found in several states, including Colorado, Kansas, Kentucky, Minnesota, Nevada, Ohio, Utah, Virginia, Washington, and Wisconsin. Despite the rising popularity of these programs, there is currently a lack of research and literature that empirically compares 4-H horseless horse programs to traditional horse programs to discover their impact on life skill development and horse knowledge in youth. It is important to show measurable impacts using empirical data that specifies life skill development because of participation in specific 4-H projects (Boleman et al., 2004). Furthermore, Cavinder et al. (2010) encouraged the development of knowledge-based horse programming in Extension by stating, "...in an era where many people do not come from a rural, horse-owning background, thus having minimal experience in horse ownership and care, it is vital that Extension programs continue to provide effective, educational opportunities to interested persons" (p. 7). Lack of prior literature and empirical research on the development of life skills and horse knowledge in youth participants of horseless horse programs presents a problem for stakeholders with a vested interest in the creation and success of programs of this nature. Therefore, the comparative evaluation of Washington County's horseless horse program and traditional horse program serves as an essential step toward meaningful horse programming for youth in which positive life skill development and horse knowledge can be measured, and a wider audience of youth may be reached in Utah.

Theoretical Framework

The theoretical framework was experiential learning with 4-H's Targeting Life Skills Model. Hendricks (1998) defined life skills as "abilities individuals can learn that will help them to be successful in living a productive and satisfying life" (p. 4). Hendricks' Targeting Life Skills Model organized 35 life skills into four quadrants, which align with the 4-H Pledge: head, heart, hands, and health (Hendricks, 1996). The purpose of the Targeting Life Skills Model was to simplify the coordination of life skill development with age-appropriate behaviors to be more

effective in achieving identified outcomes (Hendricks, 1998). Hendricks provided several age-appropriate indicator examples for each of the 35 life skills on the Targeting Life Skills Model.

4-H-based studies using the Targeting Life Skills Model found that participation in 4-H activities was positively related to youths' life skill development (Ferrari et al., 2004; Fitzpatrick et al., 2005; Fox et al., 2003; Smith et al., 2005). In this study, 10 life skills from the Targeting Life Skills Model were identified as prominent in the horse and horseless programs by the supervising Washington County Extension agent: leadership, teamwork, self-responsibility, personal safety, problem-solving, decision-making, critical thinking, goal setting, communication, and concern for others (B. Scow, personal communication, October 25, 2018).

Literature Review

Within the hands quadrant of the Targeting Life Skills Model, leadership and teamwork were commonly addressed throughout the literature. Youth participation in livestock and horse exhibition activities has repeatedly shown at least moderate gains in self-perceived leadership (Anderson et al., 2015; Davis et al., 2016; Harris et al., 2016; Walker, 2006). When evaluating leadership life skills, the following has been recommended: "state-wide and county extension programming might be reevaluated for educational events like demonstrations, leadership training and state contests to attract youth with livestock projects" (Holmgren & Reid, 2007, p. 7). Teamwork has been moderately to highly influenced by 4-H and youth organization participation (Maass, 2004). Among the 35 life skills, teamwork tied for the third most influential life skill developed by participating in 4-H for more than one year, alongside self-discipline and self-responsibility (Maass, 2004). This trend continues with activities like 4-H horse camps, which have been shown to improve teamwork in youth, as reported by 26 out of 52 surveyed Extension staff and volunteer leaders affiliated with an Arkansas 4-H summer horse camp (Kurtzo et al., 2017).

Involvement with livestock increases opportunities to learn and practice the skill of self-responsibility and personal safety, which are in the health quadrant of the Targeting Life Skills Model. In Rusk et al. (2003), 65 of 149 youth respondents (44%) indicated the responsibility they learned from participating in a 4-H animal project helped them complete homework assignments and school projects on time. Cole (2005) stated that "by learning responsibility and respect for a 1,000-pound horse, youth will also learn responsibility for their own actions and self-respect" (p. 2). Youth respondents indicated 4-H horse projects influenced them to have "learned a greater responsibility by working with a horse" (Anderson & Karr-Lilienthal, 2011, p. 3). Kurtzo et al. (2017) noted that "horsemanship and safety-based horse camps were developed in response to a statewide challenge to develop competitive 4-H members and retain those members as they approach adolescence" (p. 55). Participants increased safety and safety knowledge were accomplished goals of the 2016 Arkansas 4-H summer horse camp in Arkansas

(Kurtzo et al., 2017). Similarly, 4-H youth who participated in a one-week equine camp showed significant increases in self-perceived responsibility development (Prechter et al., 2016).

As life skills within the head quadrant of the Targeting Life Skills Model, critical thinking, problem-solving, and decision-making are prominent in 4-H research and are often studied together. 4-H horse programs and camps show greater increased growth in decision-making, critical thinking, and especially problem-solving when compared to non-4-H or non-horse groups (Cole, 2005; Kurtzo et al., 2017; Prechter et al., 2016). In one study evaluating life skill growth in at-risk youth participants of a 4-H horse and a no horse comparison program, only the horse group participants showed a significant increase in problem-solving skills compared to the control group's no horse participants (Cole, 2005). This phenomenon of life skills development in 4-H horse youth excelling beyond their non-4-H peers was also seen in Prechter et al. (2016), where 4-H youth showed significant increases in perceived problem-solving and critical thinking, and non-4-H youth did not. As for decision-making, Smith et al. (2006) measured the growth of this skill in youth participants of several horse/youth programs, including 4-H, the American Quarter Horse Youth Association, the United States Pony Clubs, and the National High School Rodeo Association in Pennsylvania and Colorado. In that study, a significant positive relationship ($r = 0.50$; $p < .01$) was found between overall horsemanship and the skills of communicating, decision-making, critical thinking, problem-solving, and goal setting.

Goal setting, located in the head quadrant of the Targeting Life Skills Model, is among the life skills most influenced by 4-H horse nonriding activities like horse bowl, demonstrations, public speaking, and art (Anderson & Karr-Lilienthal, 2011). Alumni and parent volunteers agreed goal setting was influenced by 4-H club participation (Boleman et al., 2004; Fox et al., 2003; Kurtzo et al., 2017; Maass, 2004).

Within the heart quadrant of the Targeting Life Skills Model, research has shown that increased levels of 4-H involvement significantly affect growth in communication skills, especially among older female 4-H youth participants and alumni (Fitzpatrick et al., 2005; Haas et al., 2015). 4-H alumni involved between 1969 to 1998 ($n = 223$) ranked communication 17 out of the 36 life skills taught by the 4-H program (Maass, 2004). In 4-H camp settings and horse programs, youth participants showed moderate to high levels of self-perceived growth in communication (Garton et al., 2007; Smith et al., 2006).

In contrast to communication, the life skill of concern for others has been almost entirely ignored by previous researchers evaluating life skills development in 4-H and other animal/horse programming. In a study measuring concern for others among Arkansas 4-H horse club summer campers, 50 out of 51 respondents slightly to strongly agreed that "increased concern for others" was a benefited skill in youth (Kurtzo et al., 2017).

Horse knowledge subjects taught in 4-H vary according to age and membership level. Some general horse knowledge topics taught in 4-H include nutrition and feeding practices, genetics,

anatomy and physiology, reproduction and breeding, history and evolution, horse behavior and riding theory, horsemanship and safety, horse industry/careers, horse health care, diseases, veterinary science, hoof care/farrier science, horse types and breeds, coat colors and markings, and riding equipment. Nadeau et al. (2007) tested 281 New England 4-H participants over the span of three years, showing that health and disease, breeds, colors and markings, and anatomy and physiology had the highest mean scores for equine knowledge. In contrast, the categories of nutrition and reproduction showed a need for improvement based on lower test scores.

Participants in 4-H nonriding horse activities, like demonstrations, public speaking, Horse Bowl, and art, have shown increased knowledge in all these areas, particularly horsemanship skills, horse care procedures, and safety/personal behavior around a horse (Anderson & Karr-Lilienthal, 2011). An online format of the Horse Bowl was evaluated in Colorado, from which 36 youth participants (57%) showed an increase in horse knowledge pertaining to content in the Colorado 4-H Horse Project Manual and Rule Book and other equine sources (Walls & Denniston, 2003). Nonriding workshops and clinics also create growth in knowledge (Capeheart, 2015). In Texas, a 5-day, nonriding, short-tour equine ambassador course included industry professionals' demonstrations on topics of horse health, behavior, and career development opportunities, equestrian facility tours, and a look into the field of equine Extension and expectations of equine researchers. As a result of participating in this course, the 4-H equine ambassadors' knowledge grew from the intermediate level, where ambassadors understand the basics of equine knowledge, to the expert level, where ambassadors have an advanced understanding of college-level equine science principles (Capeheart, 2015).

Purpose and Research Questions

The purpose of this study was to evaluate the life skills development and horse knowledge gained by youth in a 4-H horseless horse program as compared to that of a traditional 4-H horse program. These research questions guided the study:

1. What life skills did horseless and traditional horse program participants develop?
2. What knowledge did horseless and traditional horse program participants gain about horses, horse care, and understanding the responsibilities of horse ownership?

Methods

Research Design

The Institutional Review Board at Utah State University approved the study (protocol #10302). This collective case study used a mixed-methods approach in which members of the traditional and horseless horse programs in Washington County's 4-H program participated in semi-

structured interviews to discover their life skills development, a quantitative quiz to measure their horse knowledge, and a quantitative demographic survey. A case study was defined as an in-depth description and analysis of a bound system, meaning one particular program (Merriam & Tisdell, 2016). In a collective case study, one issue or concern is selected, but the inquirer selects multiple case studies to illustrate multiple perspectives on the same issue (Creswell, 2013). Since this case study evaluated and compared two types of 4-H horse programs within the same county or site, it is considered a collective case study. This form of research has been useful for learning about the perspectives of individuals rather than the group norms of a community (Mack et al., 2005).

Population

The target population for this study consisted of the five participants of the horseless club and 32 participants of the five traditional horse clubs in the 2018 season. The Washington County Agriculture/Natural Resources/4-H Extension agent worked with an Extension intern to develop lesson plans and a horseless horse handbook so that both the horseless club and traditional horse clubs had the same learning objectives, life skills, and topics taught by the volunteer leaders. The common topics covered by both the horseless club and traditional horse clubs were horse breeds and coat colors, farrier care, parts of a western saddle, and horsemanship. The traditional horse clubs met individually with volunteer leaders, and held riding practices two or three times per month, focusing on competitive horse judging, competitive speed riding events, and nonriding demonstration events (B. Scow, personal communication, January 19, 2019). In the horseless club, five horseless youth met for 1.5 hours once a month for six months. The horseless members learned about equipment, saddling a horse, horse breeds and colors, hoof care, and basic horsemanship. At the last meeting, the horseless members groomed, saddled, and rode a horse, aided by the traditional horse youth.

The Washington County Agriculture/Natural Resources/4-H Extension agent emailed the parents of the 4-H horse program about the research study and included an option to opt out of being contacted for this study. Parents who were willing to be contacted were called by one researcher (first author) using a recruitment script, and a follow-up email confirmed the interview details. Tickets to the local rodeo were offered as an incentive. Eleven 4-H horse program participants ($n = 7$ traditional horse; $n = 4$ horseless) participated in the study. The decision not to recruit additional individuals was determined by the concept of information redundancy or saturation, which is when sampling stops because little to no new information would derive from additional data collection (Lincoln & Guba, 1985; Morse, 2015). Additionally, Stake (2006) states that an appropriate sample size for a multicase study ranges from four to 15 participants.

Instruments

Participants completed part of the 4-H Common Measures 2.0 Universal Item questionnaire developed by the National 4-H Council, 4-H National Headquarters, and representatives from

Land Grant Universities (National 4-H Council, 2016). Eleven questions were taken from the 4-H Common Measure Universal Items to gather demographic data and the amount of exposure the participants have to 4-H programs. The questions relate to the number of years in 4-H, the amount of hours youth spend in their 4-H programs, ways they participate in 4-H (fairs, clubs, camps, school programs, community involvement, other), level of involvement (county, state, or national), age, grade, gender, race, and residence (farm, rural, town, or city).

The 20-question quiz measured participants' horse knowledge gained from participating in either the traditional or horseless horse program. The quiz focused on four topics: horse breeds and coat colors, farrier care, parts of a western saddle, and horsemanship. Each of these four sections contained five questions. Intended for youth ages 11 to 13 years old, we wrote the questions based on content in the 4-H handbook, content covered in the 2018 county 4-H horse programs, and feedback from Extension faculty. This quiz took less than 30 minutes to complete.

The questions about life skills were adapted from past literature on the Targeting Life Skills Model (Hendricks, 1998). The semi-structured interview questions asked about youth participants' experiences with 10 targeting life skills: leadership, teamwork, self-responsibility, personal safety, problem-solving, decision-making, critical thinking, goal setting, communication, and concern for others. Additional questions were asked about participants' horse ownership, the activities in the programs, and future educational and career plans. The interviews lasted roughly 30 minutes.

Data Collection

The interviews and knowledge quizzes were held one-on-one at the participants' convenience on two days that two researchers were in the county. Two interviews and knowledge quizzes of traditional horse participants were conducted virtually via Zoom. The quantitative portion involved one researcher (first author) reading the 20 questions on the quiz to ensure participants were tested on their knowledge of horses and not their reading and testing capabilities. For the qualitative portion, one researcher (first author) followed a semi-structured interview guide to ensure a series of questions were asked to each participant but had the freedom to probe beyond the answers to the questions. Interviews were recorded using the Voice Memos app on the iPhone. Another researcher (second author) took notes by hand during the interviews.

Data Analysis

The demographic characteristics and knowledge quiz responses were computed using Statistical Package for the Social Sciences (SPSS) version 24 for Mac. Horse knowledge questions were scored as right or wrong. The mean and standard deviation were reported for the entire quiz for the horseless horse program participants compared to the traditional horse program participants. For each multiple-choice or true-false question on the quiz, the frequency of participants who correctly answered each answer choice was reported (Lord, 1952). The interview audio files

were transcribed by an independent service, and then two researchers (first author and second author) checked for accuracy against the recordings (Richards, 2014). Interview transcripts were analyzed by one researcher (first author) using QSR NVivo qualitative analysis software version 12. The interview transcripts were analyzed following the thematic analysis technique (Braun & Clarke, 2006). The analysis started by defining major themes *a priori*, and in this case, such themes were designed around 10 life skills from 4-H's Targeting Life Skills Model (Hendricks, 1998). One researcher (first author) carried out initial coding of the data on two transcripts to develop the major themes and their sub-themes (Braun & Clarke, 2006). Next, two researchers (first author and second author) discussed these major themes, reorganized the sub-themes, and reached a consensus and agreed upon the major themes and sub-themes. One researcher (first author) coded the major themes and sub-themes for the remaining interview transcripts. The major themes and sub-themes were analyzed by running coding queries and writing about patterns found in the themes and sub-themes.

Ethical Considerations

Face validity and content validity of the semi-structured interview guide and horse knowledge quiz were established by three faculty in Extension education, the state 4-H equine specialist, and the Washington County Extension agent supervising the 4-H horse programs. Validity concerns with the qualitative semi-structured interviews were addressed by evaluating its trustworthiness (Lincoln & Guba, 1985; Merriam, 1995). Peer debriefings and independent coder reviews throughout the data analysis process addressed credibility. We provided a detailed account of the knowledge and skills gained from participating in either a 4-H traditional horse or horseless horse club to help others to evaluate the extent to which the findings and conclusions drawn are transferable. Rich, thick descriptions and long, detailed quotations achieved transferability. The county Extension agent supervising the 4-H horse program shared the lesson plans and activities the participants did to provide context for the results of this study and triangulate the data. These documents contributed as data sources and complemented the information participants shared about the life skills they gained through participation in their club. Two researchers not involved in the data collection and analysis process conducted an external audit to confirm that the data supported the findings, interpretations, and conclusions (Creswell, 1998). The methods used to achieve confirmability of the data collection and analysis method were an audit trail, triangulation of sources, and reflexivity (Lincoln & Guba, 1985). The audit trail consisted of raw data (transcripts, field notes about the interviews, and 4-H Common Measures Universal survey results). For reflexivity, we disclosed our beliefs and experiences with horses that may impact the study's research process. No response bias existed because the researcher asking the quiz and interview questions had no relationship with the participants and lived 300 miles north of the county. One researcher (first author) was not a 4-H alumnus nor worked in Cooperative Extension. To bring forth potential biases, two researchers are horse owners recreationally, and one researcher worked in the horse industry as an equestrian facility manager. Therefore, we might have had involuntary biases about the benefits of participating in horse activities.

Results

The participants were predominantly females ($n = 4$ horseless; $n = 6$ traditional). The only male was a traditional horse participant. Most of the respondents were also Caucasian ($n = 2$ horseless; $n = 7$ traditional). Two horseless participants indicated being *more than one race*. Ages of horseless participants were not diverse, ranging from 10 to 13 years old, with a mean age of 11 years old. Traditional horse participants' ages ranged more widely from 11 to 16 years old, with a mean age of 13 years old. Overall, the grades of the participants also ranged widely, with horseless youth ranging from grades 4 to 8 and traditional horse youth ranging from grades 5 to 11. The participants in this study reported living in one of three places: a farm ($n = 3$ traditional), a non-farm rural area with a population less than 10,000 ($n = 2$ horseless; $n = 1$ traditional), or a town with a population of 10,000 to 50,000 ($n = 2$ horseless; $n = 3$ traditional).

Participants indicated how many years they had been participating in 4-H: one year ($n = 2$ horseless), two years ($n = 1$ horseless; $n = 1$ traditional), four years ($n = 5$ traditional), or five or more years ($n = 1$ horseless; $n = 1$ traditional). The horseless participant who indicated five or more years in 4-H had experience in other 4-H clubs. Participants then indicated how many hours per week they participate in 4-H activities: less than one hour per week ($n = 2$ horseless; $n = 0$ traditional), one hour per week ($n = 1$ horseless; $n = 4$ traditional), two hours per week ($n = 0$ horseless; $n = 2$ traditional), three hours per week ($n = 0$ horseless; $n = 1$ traditional), or four hours per week ($n = 1$ horseless; $n = 0$ traditional). Both groups indicated being involved in clubs ($n = 4$ horseless; $n = 6$ traditional) and working on projects at home ($n = 2$ horseless; $n = 5$ traditional). Traditional horse participants also indicated being involved in community service projects ($n = 5$), local fairs and events ($n = 4$), and after-school programs ($n = 1$). All the participants indicated being involved at the county level of 4-H, three at the state level ($n = 1$ horseless; $n = 2$ traditional), and none at the national level.

Participants were asked about their future educational and career plans. Seven participants indicated they wanted to go to college ($n = 3$ horseless; $n = 4$ traditional). One traditional horse participant, Interviewee 1, would consider college if it led to a career with horses. Whereas, horseless Interviewee 3 did not mention college, so it is unclear if that individual would attend college or not. When all participants were asked about future career plans, responses included being a veterinarian ($n = 2$ horseless; $n = 2$ traditional), having an undecided career with horses or other animals ($n = 1$ horseless; $n = 3$ traditional), having a non-horse industry career ($n = 0$ horseless; $n = 3$ traditional), ranching ($n = 1$ horseless; $n = 0$ traditional), and being a professional horse trainer/rodeo rider ($n = 0$ horseless; $n = 1$ traditional). The non-horse industry careers chosen by three traditional horse participants were hotel management, owning a recreational vehicle business, and professional singing.

What Life Skills Did Horseless and Traditional Horse Program Participants Develop?

The results for the 10 life skills measured in this study are organized by the quadrants of the targeting life skills model: hands, health, head, and heart.

Hands Quadrant

The definition of leadership is “to assist the group in meeting its goals by showing or directing along the way; using personal influence to guide the group in reaching its goals” (Hendricks, 1998, p. 30). Seven participants did not share instances of learning or practicing leadership in their 4-H club ($n = 4$ horseless; $n = 3$ traditional). Two traditional and two horseless participants indicated that adults led the 4-H activities, so these participants had no opportunities to practice leadership. Four traditional horse participants participated in formal, structured leadership roles in 4-H: leading the 4-H pledge, serving as an officer, being on the party planning committee, or being a trail ride leader. Interviewee 8 said the following:

I was appointed trail leader, and I got to text everything out to them and led the group... As a trail leader, we find the place where we go out on the trail ... we lead the group to wherever we're going: swimming in the river, going up the mountain side, et cetera.

Teamwork is defined as “work done by two or more people, each doing parts of the whole task” (Hendricks, 1998, p. 31). Three horseless and six traditional horse participants described teamwork activities. The horseless participants worked in teams to lift a western saddle with the help of an older peer and passing parts of the saddle to each other while fitting it to the horse. When horseless participants rode a horse, they helped each other mount the horse and took turns to ride. The traditional horse participant, Interviewee 8, described a mounted team racing game: “You have a piece of toilet paper, and you hold it between the two horses, and the goal is to not break it.” The horseless participant, Interviewee 9, recalled an unmounted learning game where one horseless participant pretended to be a horse, and the other led that participant from the left side with a lead rope. Other participants identified service projects where they practiced teamwork ($n = 0$ horseless; $n = 4$ traditional). Specific service project activities mentioned were cleaning up wires from a farmer's field ($n = 1$) and cleaning up after the local rodeo ($n = 1$). Additional teamwork activities for traditional horse participants were setting up poles and obstacles together at riding practice ($n = 1$) and memorizing riding patterns as a team and helping each other to remember the patterns ($n = 1$). Of the 11 horse program participants, one horseless participant could not recall a teamwork experience, and one traditional horse participant did not share an experience of learning teamwork in 4-H.

Health Quadrant

Self-responsibility is defined as “taking care of oneself; being accountable for one's behavior and obligations; choosing for oneself between right and wrong” (Hendricks, 1998, p. 33). Most

participants indicated that caring for a horse is one way to practice self-responsibility ($n = 4$ horseless; $n = 6$ traditional). Examples of responsibly caring for a horse included feeding and watering on a regular schedule, washing and grooming, cleaning up, providing safe and comfortable housing, scheduling regular hoof care, using safe handling and transportation practices, and taking a rectal temperature. Six traditional horse participants experienced self-responsibility because they regularly cared for a horse and/or riding equipment. No horseless participants could practice acts of self-responsibility during their time in the horseless club. One horseless participant recalled seeing and learning about grooming and farrier equipment in a demonstration, but not actually grooming a horse. Another horseless participant recalled learning in 4-H about the importance of shutting gates to prevent horses from getting loose, then practicing this later at a non-4-H horse camp.

Personal safety is defined as “taking care to avoid danger, risk, or harm; self-protection; being cautious, careful; physically and emotionally safe” (Hendricks, 1998, p. 32). Horseless and traditional horse participants suggested wearing safe attire around horses to practice personal safety: helmet ($n = 3$ horseless; $n = 6$ traditional), boots or closed-toe shoes ($n = 3$ horseless; $n = 3$ traditional), and pants ($n = 3$ horseless; $n = 2$ traditional). The participants practiced personal safety by behaving appropriately around horses: not standing directly behind a horse, being aware of your feet when handling a horse, using proper riding position to avoid falling and/or being dragged by a horse, and being aware of things around you that may spook a horse ($n = 4$ horseless; $n = 6$ traditional). Other safety behaviors described were acting calm, speaking quietly, and avoiding loud noises ($n = 3$ horseless; $n = 2$ traditional). Two participants also shared how they gain control of an unruly horse when riding by pulling its head around to their knee ($n = 1$ horseless; $n = 1$ traditional). Four participants practiced personal safety by attending to the horse’s attire. Two traditional horse participants highlighted the importance of tack-checks to ensure that tack is well-fitted and secure; one traditional horse participant named specific riding equipment (sliders and polo wraps as leg protection for reining horses), and one horseless participant said she took care to place a saddle on a horse softly and carefully to avoid laying the horse’s hair in the wrong direction and causing discomfort to the horse.

Head Quadrant

Problem-solving is defined as “clearly identifying a problem and a plan of action for resolution of the problem” (Hendricks, 1998, p. 25). No horseless participants recalled a problem-solving experience in the 4-H horse program. Six traditional horse participants either indicated having no problems to solve in 4-H or gave an example that did not fit the definition of problem-solving.

Decision-making is defined as “developing good judgement, gathering information to make good decisions, and choosing among several alternatives” (Hendricks, 1998, p. 25). It is noteworthy that none of the participants were presented with opportunities to choose from several alternatives. Decision-making opportunities were limited to choosing between two alternatives (n

= 4 horseless; $n = 5$ traditional). The four horseless participants made decisions about whether to ride or not to ride the horse ($n = 2$), to walk or to trot ($n = 2$), and to turn the horse left or right ($n = 1$). Traditional horse participants were also faced with two-alternative decisions: whether or not to sell their horse ($n = 2$), whether or not to participate in a 4-H horse event ($n = 2$), whether to feed alfalfa or grass ($n = 2$), which of two horses to ride in 4-H practice ($n = 1$), and whether or not to accompany a parent when taking a horse to the vet to be euthanized ($n = 1$). One traditional horse participant did not recall decision-making experiences in the 4-H horse program.

Critical thinking is defined as “strategies for analyzing, comparing, reasoning, and reflecting focused on deciding what to believe or do; discovering meaning; building connections with past learning” (Hendricks, 1998, p. 26). Many of the participants were not familiar with critical thinking and could not share examples of practicing critical thinking in the 4-H horse program ($n = 4$ horseless; $n = 3$ traditional). Only one traditional horse participant displayed an understanding of critical thinking that aligned with this study’s definition. Interviewee 10 described the critical thinking experience of thinking about where to ride in the arena, in proximity to other horses that may be acting up, saying, “You have to decide whether you want to space it out or go around them.”

Goal setting is “identifying a desired purpose or result, identifying tasks or steps necessary to achieve goals, making and following an action plan, and revising the plan if the goal is not met” (Hendricks, 1998, p. 26). Two horseless participants did not set goals in the horseless program. However, the other horseless participants developed informal goals of learning how to ride a horse ($n = 2$) and one day owning a horse of their own ($n = 1$). Similarly, six traditional horse participants had informal goals of improving their riding skills. Only one traditional horse participant set a formal fundraising goal achieved by offering pony rides at the local fair.

Heart Quadrant

Communication is defined as the “exchange of thoughts, information or message between individuals; sending and receiving information using speech, writing, gestures and artistic expression” (Hendricks, 1998, p. 27). Most participants practiced verbal communication in the horse program ($n = 2$ horseless; $n = 7$ traditional). Verbal communication experiences shared by the participants were instances of them asking questions to judges, instructors, or adults ($n = 1$ horseless; $n = 4$ traditional); public speaking opportunities like demonstrations or presentations ($n = 5$ traditional); and communicating with the horse through vocal cues ($n = 1$ horseless; $n = 3$ traditional). Nonverbal communication experiences included understanding a horse’s mood through the animal’s body language ($n = 3$ horseless; $n = 3$ traditional) and, in turn, communicating to the horse through riding cues ($n = 2$ horseless; $n = 3$ traditional). One traditional horse participant learned eye contact by participating in a 4-H demonstration.

Concern for others is “to worry about or give attention to the well-being of others, offering assistance to those in need, being aware of their own emotions and feelings, and showing compassion and caring for others’ feelings” (Hendricks, 1998, p. 29). Five participants did not identify an experience of developing concern for others ($n = 2$ horseless; $n = 3$ traditional). Five participants shared instances of having concern for peers’ emotional and physical well-being and showing them compassion ($n = 1$ horseless; $n = 4$ traditional).

What Knowledge Did Horseless and Traditional Horse Program Participants Gain?

Overall, traditional horse participants had better horse knowledge scores than horseless horse participants. The average score of horseless participants was 12.75 out of 20 ($SD = 2.22$), and the average score of traditional horse participants was 18.86 out of 20 ($SD = 0.90$). As shown in Table 1, the knowledge scores are reported for each section of the quiz: (a) breeds and coat colors, (b) farrier care, (c) saddling a horse, and (d) horsemanship.

Table 1. Knowledge Scores for Traditional Horse versus Horseless Horse Participants

Sections	Horseless		Traditional	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Breeds and coat colors	4.00	0.82	5.00	0.00
Farrier care	3.50	0.58	4.71	0.49
Saddling a horse	2.25	1.50	4.58	0.77
Horsemanship	3.00	0.82	4.57	0.77

All the traditional horse participants correctly responded to the questions in the breeds and coat colors section, as seen in Table 2. The horseless participants displayed partial knowledge in this area, with 25% or 50% of participants answering the questions regarding markings incorrectly.

Table 2. Correct Responses for Knowledge Questions about Breeds and Coat Colors

Knowledge Question	Horseless		Traditional	
	<i>n</i>	%	<i>n</i>	%
A golden horse with a white mane and tail is called a ____.	2	50	7	100
What horse breed always has a pinto coat pattern?	4	100	7	100
Which of these is a real horse breed?	4	100	7	100
What is the name of a white spot marking on the forehead?	3	75	7	100
What is the name of this white marking on the leg?	3	75	7	100

In the farrier care section, traditional horse participants indicated correct responses to all questions except this question: “This part of the hoof is called the _____,” coupled with a black and white illustration of the hoof from the 4-H handbook and a line pointing to the frog of the hoof. As shown in Table 3, none of the horseless participants answered question 6 correctly. Among both groups, the incorrect answer indicated was the “sole.”

Table 3. Correct Responses for Knowledge Questions about Farrier Care

Knowledge Question	Horseless		Traditional	
	<i>n</i>	%	<i>n</i>	%
Someone who trims and shoes horse hooves is called a ____.	3	75	7	100
This part of the hoof is called the ____.	0	0	5	71
What does it mean when a horse is lame?	3	75	7	100
The tool used to clean dirt from the inside of a horse's hoof is called a ____.	4	100	7	100
True/False: Horse hooves grow continually.	4	100	7	100

All the traditional horse participants correctly indicated the parts of the western saddle: fender, horn, and cantle, and the majority indicated the fork and skirt correctly (see Table 4). All the horseless participants correctly indicated the horn of the western saddle but displayed less understanding of the rest of the parts of the saddle, including the skirt, fender, cantle, and fork.

Table 4. Correct Responses for Knowledge Questions about Saddling a Horse

Knowledge Question	Horseless		Traditional	
	<i>n</i>	%	<i>n</i>	%
Identified the fork on a western saddle.	0	0	5	71
Identified the skirt on a western saddle.	2	50	6	86
Identified the fender on a western saddle.	2	50	7	100
Identified the horn on a western saddle.	4	100	7	100
Identified the cantle on a western saddle.	1	25	7	100

Traditional horse participants displayed good mastery of knowledge in horsemanship questions (Table 5). Only one traditional horse participant indicated the wrong definition of equitation, and two others misidentified a black and white illustration of a curry comb, from the 4-H handbook, as a sweat scraper. The horseless participants displayed moderate knowledge of horsemanship. None of the horsemanship questions received correct responses from all horseless participants.

Table 5. Correct Responses for Knowledge Questions about Horsemanship

Knowledge Question	Horseless		Traditional	
	<i>n</i>	%	<i>n</i>	%
Choose a definition for equitation.	2	50	6	86
Horse riding equipment, like saddles or bridles, are called ____.	2	50	7	100
Which of these is not considered a gait of the horse?	3	75	7	100
Identify this piece of grooming equipment.	2	50	5	71
Which of these is the definition of a riding aid?	3	75	7	100

Conclusions/Recommendations/Implications

Only traditional horse participants ($n = 4$; 35%) shared examples of participating in formal leadership roles in 4-H. Traditionally, 4-H clubs have youth-elected officers, and regular meetings are held after school (Enfield, 2001). The horseless horse club in this study has no official leadership positions, so this limited the participants' ability to develop formal leadership skills. These youth might have unknowingly practiced leadership through age-appropriate qualities. Hendricks described age-appropriate leadership qualities for three age groups. The 9- to 11-year-olds contributed to the group effort, helped to set group goals, valued diversity, and identified one's own competencies. The 12- to 14-year-olds negotiated personal and group needs; practiced assertiveness, used their own competencies; identified role models; and enjoyed group membership, symbols, and regalia. Finally, 15- to 19-year-olds organized groups to accomplish a purpose, recognized different ways to accomplish a task, understood personal strengths, teach others new skills, and explore opportunities for adult leadership. Based on this information, horseless participants in this program demonstrated a couple of age-appropriate leadership qualities by contributing to group effort and identifying their own talents. Traditional horse participants demonstrated more age-appropriate leadership qualities in comparison by finding roles to use their skills, practicing assertiveness around horses, identifying role models, organizing groups to accomplish a purpose, and teaching others new skills.

Both groups of participants demonstrated teamwork, which was not surprising because studies show teamwork is highly influenced by participation in 4-H (Fitzpatrick et al., 2005; Maass, 2004). Live horse interaction was a common factor between the horseless and traditional horse participants who described teamwork experiences. The three horseless participants who recalled practicing teamwork described the time they saddled a horse together, while three traditional horse participants recalled various acts and games of teamwork during their riding practices. These experiences of teamwork are expected, and these activities were also found in Arkansas 4-H horse camps, which show to improve teamwork in youth (Kurtzo et al., 2017).

Self-responsibility has been repeatedly perceived, among both youth and parents, as the number-one life skill gained from a 4-H project (Boleman et al., 2004; Holmgren & Reid, 2007). Nearly all participants in this study suggested that caring for a horse is a good way to practice self-responsibility. This idea closely aligned with Cole's (2005) theory that "by learning responsibility and respect for a 1,000-pound horse, youth will also learn responsibility for their own actions and self-respect" (p. 2). Based on this ideology, traditional horse participants developed self-responsibility more than the horseless participants because they regularly cared for a horse or riding equipment in the 4-H horse program or at home.

The findings about personal safety skills in horseless and traditional horse participants were consistent with research by Smith et al. (2006), where safety was the second highest horsemanship skill that youth in 4-H and non-4-H traditional horse programs were able to

perform. Furthermore, Washington County's leader guide stated that "safety must always be the first consideration during horseless program activities" (Washington County Extension, 2018, p. 5). Practicing personal safety was a common theme among many horseless and traditional horse curriculums throughout the nation (Minnesota State University 4-H, 2003). As expected, all participants in this study described practicing personal safety by wearing safe attire and behaving appropriately around a horse. This finding was similar to participants who increased their safety skills around horses during a 2016 Arkansas 4-H summer horse camp by participating in lessons, groundwork, group riding, and mock competitions (Kurtzo et al., 2017).

The traditional horse and horseless participants lacked development of problem-solving skills. Only one traditional horse participant shared an experience of problem-solving where the participant described scheduling the 4-H club riding practice. Furthermore, some youth feel there were no problems to solve in 4-H. This was unusual because literature showed that 4-H horse programs positively influence problem-solving (Cole, 2005; Haas et al., 2015; Kurtzo et al., 2017; Prechter et al., 2016; Smith et al., 2006). Perhaps problem-solving opportunities were overlooked by the study's participants because they looked to adult leaders to solve them. The fact that horseless participants met for 1 hour 30 minutes once a month for 6 months could explain why problem-solving was a life skill not developed because the curriculum topics did not enhance that life skill.

Decision-making experiences were shared by several of the horseless and traditional horse participants ($n = 4$ horseless; $n = 5$ traditional), showing that decision-making opportunities were often present in the horse program. The ages of horseless participants in this study ranged from 10 to 13 years old, with a mean age of 11 years old. Their decisions were whether or not to ride a horse ($n = 2$), to walk or to trot ($n = 2$), and to turn the horse left or right ($n = 1$). These decision-making experiences of the horseless participants were more appropriate for 5- to 8-year-olds (Hendricks, 1998). The decisions did not reflect an age-appropriate level in which the 9- to 11-year-olds would seek out information, develop their own opinions, and choose among several alternatives (Hendricks, 1998). This showed room for developing decision-making opportunities in this horseless horse program. The traditional horse participants were older (11 to 16 years old) and had more advanced decision-making experiences than the horseless participants but lacked the opportunity to choose among several alternatives. Hendricks (1998) recommended that 12- to 14-year-olds "classify information for use, compare and choose among several alternatives, and begin to make personal decisions based on forethought" (p. 36). Children 15 to 19 years old "specify goals and constraints, consider risks, generate and evaluate alternatives, apply personal values criteria to choices, and take freedom from parental control to make decisions" (p. 36). The traditional horse participants demonstrated advanced decision-making themes of making decisions based on forethought, considering risks, and applying personal values to choices (Hendricks, 1998).

The traditional horse and horseless programs lacked the development of critical thinking. Of all participants, only one traditional horse participant understood the definition of critical thinking and described how to incorporate critical thinking when handling horses. This was unusual because 4-H horse programs positively influence critical thinking (Cole, 2005; Haas et al., 2015; Kurtzo et al., 2017; Maass, 2004; Prechter et al., 2016; Smith et al., 2006). The Extension educator revealed that critical thinking should happen in the Washington County Horse Program (B. Scow, personal communication, January 19, 2019). Perhaps the volunteer leaders lacked sufficient training to encourage and develop this life skill in the participants properly.

When developing the goal-setting skill, it is important to develop an action plan with the necessary steps to achieve the goal within a certain time frame. Most participants described having personal goals that involve developing or improving horseback riding skills but have no formal process for completing these goals ($n = 2$ horseless; $n = 6$ traditional). This finding was different from previous research where goal setting was positively influenced by nonriding horse 4-H activities (Anderson & Karr-Lilienthal, 2011). The nonriding activities described in Anderson and Karr-Lilienthal involved tracking the progress of goals in a 4-H record book, as is usually required of traditional 4-H horse projects. Hendricks (1998) outlined six steps to achieving a goal, from identifying an appropriate goal to revising the plan if the intended goal was not met. In this study, only one traditional horse participant described a formal goal-setting experience where a club's specific fundraising goal was met by offering pony rides to people at the local fair. The goal-setting process was different for horseless participants because they met for about 1 hour 30 minutes for 6 months, and they did not continue lessons outside of the setting, which provided fewer goal-setting development opportunities than traditional horse participants.

The Washington County 4-H Horse Guide states that youth participants would learn communication as a life skill (Washington County Extension, 2017). This life skill was achieved by most of the participants who practiced verbal communication in the horse program ($n = 2$ horseless; $n = 7$ traditional). It was noteworthy that the horseless participants identified several ways to communicate with horses and humans nonverbally. In contrast, traditional horse participants provided more examples of how they communicated verbally. This finding might be because traditional horse participants had public speaking and demonstration opportunities that horseless participants did not have.

Roughly half of the participants in both groups experienced concern for others in their program. This moderate number of incidences in which participants used this skill simply adds to the limited literature available. Kurtzo et al. (2017) reported that nearly all the participants agreed "increased concern for others" was a benefit of participating in the Arkansas 4-H summer horse camp.

The greater horse knowledge of traditional horse participants can relate to their number of years in 4-H. Many traditional participants have been in 4-H twice as long as most of the horseless participants. This is consistent with the findings of Nadeau et al. (2007), where traditional horse participants with three or more years of 4-H experience scored higher than traditional horse participants with two or fewer years of experience. The breeds and coat colors quiz section had the highest mean scores for both horseless and traditional horse participants. Similarly, Nadeau et al. (2007) reported that the categories of breeds, coat colors, and markings were among the highest mean scores for horse knowledge from New England traditional horse participants over the course of three years.

Involvement in 4-H nonriding horse activities, like demonstrations, public speaking, horse bowl, and art, have increased knowledge of horsemanship skills (Anderson & Karr-Lilienthal, 2011). Furthermore, nonriding workshops and clinics also created growth in knowledge of horsemanship skills (Capeheart, 2015). However, results in this study show that knowledge of horsemanship and parts of a saddle are most in need of improvement based on somewhat lower test scores of both horseless and traditional horse participants. Scores on the test section that identified parts of a saddle may have been lower because we corrected one error in the drawing by hand on each quiz. Despite this, the need for horse knowledge development is greater for horseless participants than traditional horse participants because traditional participants all score 90% or higher on the quiz. The horseless participants in this study do not participate in demonstrations, horse bowl, or art activities, which can explain their lower horsemanship knowledge. Their lower quiz scores can indicate poor retention of horse knowledge because the study was conducted 10 months after these participants completed the horseless horse program.

Limitations and Recommendations for Research

The scope of this case study was limited to one county in Southwestern Utah. Washington County was the only county in Utah with a 4-H horse program that offered both horseless and traditional horse clubs. Generalizations should be considered with caution, acknowledging the demographics of this small study. Participants were not randomly sampled; they were purposefully identified through a roster of participants in the two 4-H programs provided by the Extension educator. The traditional horse participants have previous experience in 4-H horse programming, which can impact their existing knowledge of horses. We did not assess the experience levels of the adult 4-H leaders and volunteers who taught the youth participants, which could impact what life skills and horse knowledge is shared with the study's participants. Lastly, the sample might not be representative of the horseless youth who are unaware of 4-H programs in Washington County.

Existing horseless horse curriculums around the nation need empirical evaluation for their efficiency in developing life skills and knowledge in participants. If county Extension programs create or adopt existing horseless horse curricula, the Extension agent should collect both pre-

and post-program evaluation data to track the growth of life skills and horse knowledge. Observational research at the traditional and horseless horse club meetings, activities, and riding practices would document the life skills practiced rather than relying only on self-reported data from participants. In-depth interviews with the county horse program volunteers would detail life skills taught in their programs, consistency of attendance, the learning objectives, and the curriculum. Using this holistic approach to research would provide accountability and stakeholder involvement for a county 4-H horse program, which an increasing number of state Extension programs are challenged to report. Future research could implement a quasi-experimental design in which mediator and moderator variables are evaluated to compare the influence of 4-H leaders and volunteer training and parents on the development of life skills and knowledge in youth participants.

The Targeting Life Skills Model is incorporated in 4-H programming across the nation. As this model continues to gain prevalence, future research should measure skills from each quadrant of Hendricks's (1998) targeting life skills model to understand better how all 35 skills can be developed. Certain life skills need more investigation than others to have well-rounded literature. Future research should consider whether concern for others is present in the 4-H horse program curriculum, if it is developed in participants of 4-H horseless and traditional horse programs, and what activities contribute to the development of concern for others.

Recommendations for Practice

Extension educators interested in offering a horseless horse program should create a manual with an evidence-based curriculum designed for age-appropriate life skill development and horse knowledge in junior, intermediate, and senior members. New programs could adopt curriculum from existing horseless horse manuals of many states, including Colorado, Kansas, Kentucky, Minnesota, Montana, Nevada, Ohio, Pennsylvania, Virginia, Washington, or Wisconsin.

We suggested improvements or enhancements to nine of the 10 life skills evaluated in this study: leadership, teamwork, self-responsibility, problem-solving, decision-making, critical thinking, goal setting, communication, and concern for others. Upon comparison, the traditional horse participants had more opportunities with live horses, which helped them develop leadership, self-responsibility, goal setting, and communication skills more than the horseless participants. Involving horseless participants in more live-horse activities might increase their development of these life skills. Slocum (2004) found that the longer the tenure in 4-H and the more hours devoted to 4-H, the higher the level of youth participation in 4-H leadership activities, and thus the greater the level of leadership life skills gained by the youth. If horseless participants meet the same number of times per month as traditional participants, the horseless participants might gain more life skill experiences. The duration of the horseless program should match that of the traditional horse program by holding regular meetings during the school year from September to June.

To promote leadership, participants should elect officers and organize the following meetings, activities, and project plans in the first horseless club meeting. Planned activities should include meaningful incentives that increase attendance to horseless club meetings and life-skill development opportunities. Examples of meaningful incentives could be a point system that rewards time spent at meetings or on nonriding projects and life-skill development games. Involving horseless participants in the same unmounted club activities as traditional participants might increase their life skills development. Horseless participants could develop better teamwork skills by attending the same community service projects as traditional horse participants.

Youth who keep and update 4-H record books demonstrate increased goal-setting development (Diem & Devitt, 2003). Therefore, goal setting could improve for both horseless and traditional horse participants who make a goal with planned steps to reach that goal. Horseless and traditional participants should give demonstrations as an opportunity to increase communication skills. Finally, both groups of participants can practice concern for others while interacting with peers and animals at club meetings.

The results of this study suggest that 4-H leaders need training on how to help youth participants develop decision-making, problem-solving, and critical thinking skills. Decision-making opportunities can improve for both groups of participants in this age group by having opportunities to make decisions with several alternatives rather than just two. To strengthen problem-solving experiences among both traditional and horseless participants, the volunteer leaders would present more age-appropriate challenges for the youth. Michigan State University Extension (2016) suggested two activities for 4-H members to learn problem-solving: assess the care and well-being of horses on a farm and role-play ways to resolve conflict in a club or group setting. Critical thinking development could improve by educating participants on what it means to think critically and challenging them to do so, according to what can be comprehended by their age. 4-H leaders can emphasize the qualities of critical thinking by encouraging them to discover meaning or understand the “whys” behind what they are being taught and to draw connections with past learning.

References

- Anderson, J., Bruce, J. A., Jones, D. W., & Flowers, J. L. (2015). The impact of livestock exhibition in youth leadership skill development: Youth agricultural organizations. *Journal of Extension*, 53(1), Article 1. <https://tigerprints.clemson.edu/joe/vol53/iss1/1/>
- Anderson, K. P., & Karr-Lilienthal, L. (2011). Influence of 4-H horse project involvement on development of life skills. *Journal of Extension*, 49(5), Article 14. <https://tigerprints.clemson.edu/joe/vol49/iss5/14/>

- Boleman, C. T., Cummings, S. R., & Briers, G. E. (2004). Parents' perceptions of life skills gained by youth participating in the 4-H beef project. *Journal of Extension*, 42(5). <https://archives.joe.org/joe/2004october/rb6.php>
- Brandon, D. P., Tsamaase, M., Humphrey, R., & Crenshaw, K. (2018). Urban Extension's new nontraditional offering: Parent-child reading enhancement program. *Journal of Extension*, 56(1), Article 8. <https://tigerprints.clemson.edu/joe/vol56/iss1/8/>
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77–101. <https://www.doi.org/10.1191/1478088706qp063oa>
- Capeheart, M. L. (2015). *Effects of the Texas 4-H equine ambassador short course on 4-H youth and the perceived impact on equine production knowledge, career awareness and professional development* [Doctoral dissertation, Texas A&M University]. <https://oaktrust.library.tamu.edu/>
- Cavinder, C. A., Antilley, T. J., Briers, G., Sigler, D., Davidson, D., & Gibbs, P. G. (2010). Educational value of horsemanship clinics to youth and adult riders. *Journal of Extension*, 48(6), Article 19. <https://tigerprints.clemson.edu/joe/vol48/iss6/19/>
- Cole, D. (2005). Horses and youth (HAY): A not-so-typical approach to at-risk programming. *Journal of Extension*, 42(3), Article 12. <https://tigerprints.clemson.edu/joe/vol43/iss3/12/>
- Creswell, J. W. (1998). *Qualitative inquiry and research design choosing among five traditions*. SAGE Publications.
- Creswell, J. W. (2013). *Qualitative inquiry & research design*. SAGE Publications.
- Davis, T. K., Stripling, C. T., Stephens, C. A., & Loveday, H. D. (2016). Understanding life skills gained from and reasons for youth participation in the Tennessee 4-H sheep skillathon. *Journal of Extension*, 54(4). <https://archives.joe.org/joe/2016august/rb7.php>
- Diem, K. G., & Devitt, A. (2003). Shifting the focus of 4-H record-keeping from competitions and subject matter to youth development and life skills. *Journal of Extension*, (41)6. <https://archives.joe.org/joe/2003december/iw1.php>
- Enfield, R. P. (2001). *Head, heart, hands, and health: Experience and education by Dewey's criteria?* [Paper presentation]. Annual Meeting of the American Education Research Association, Seattle, WA, United States.
- Ferrari, T., Hogue, C., & Scheer, S. (2004). Parents' perceptions of life skill development in the 4-H cloverbud program. *Journal of Extension*, 42(3). <https://archives.joe.org/joe/2004june/rb6.php>
- Fitzpatrick, C., Gagne, K. H., Jones, R., Lobley, J., & Phelps, L. (2005). Life skills development in youth: Impact research in action. *Journal of Extension*, 43(3). <https://archives.joe.org/joe/2005june/rb1.php>
- Fox, J., Schroeder, D., & Lodl, K. (2003). Life skills development through 4-H clubs: The perspective of 4-H alumni. *Journal of Extension*, 41(6). <https://archives.joe.org/joe/2003december/rb2.php>

- Garton, M. S., Miltenberger, M., & Pruett, B. (2007). Does 4-H camp influence life skill and leadership development? *Journal of Extension*, 45(4).
<https://archives.joe.org/joe/2007august/a4.php>
- Haas, B. E., Mincemoyer, C. C., & Perkins, D. F. (2015). The effects of age, gender, and 4-H involvement on life skill development. *Journal of Extension*, 53(3), Article 28.
<https://tigerprints.clemson.edu/joe/vol53/iss3/28/>
- Harris, J. M., Stripling, C. T., Stephens, C. A., & Loveday, H. D. (2016). Life skill development of youth participants of the Tennessee 4-H beef skillathon. *Journal of Youth Development*, 11(1), 88–97. <https://doi.org/10.5195/jyd.2016.436>
- Hendricks, P. A. (1996). *Targeting life skills model*. Iowa State University Extension.
- Hendricks, P. A. (1998). *Developing youth curriculum using the targeting life skills model: Incorporating developmentally appropriate learning opportunities to assess impact of life skill development*. Iowa State University Extension.
- Holmgren, L. N., & Reid, C. R. (2007). 4-H & FFA livestock projects: Life skills gained and knowledge learned. *Journal of Youth Development*, 2(1), Article 0701RS002.
<https://doi.org/10.5195/jyd.2007.367>
- Kurtzo, F., Leslie, D. E., Graham, D. L., & Russell, M. (2017). Straight from the horse(man)'s mouth: Innovative 4-H camps. *Journal of Extension*, 55(5), Article 18.
<https://tigerprints.clemson.edu/joe/vol55/iss5/18/>
- Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. SAGE Publications.
- Lord, F. M. (1952). The relation of the reliability of multiple-choice tests to the distribution of item difficulties. *Psychometrika*, 17(2), 181–194. <https://doi.org/10.1007/BF02288781>
- Maass, S. E. (2004). *A study of life skills development of Oklahoma 4-H alumni during the years of 4-H participation 1969-1998* [Master's thesis, University of Florida]. University of Florida Theses & Dissertations.
- Mack, N., Woodsong, C., MacQueen, K. M., Guest, G., & Namey, E. (2005). *Qualitative research methods: A data collector's field guide*.
<https://www.fhi360.org/resource/qualitative-research-methods-data-collectors-field-guide>
- Merriam, S. B. (1995). What can you tell from an N of 1? Issues of validity and reliability in qualitative research. *PAACE Journal of Lifelong Learning*, 4, 51–60.
<https://eric.ed.gov/?id=EJ497233>
- Merriam, S. B., & Tisdell, E. J. (2016). *Qualitative research: A guide to design and implementation* (4th ed.). Jossey-Bass.
- Michigan State University Extension. (2016). *Head life skills for 4-H projects*. Michigan State University. https://www.canr.msu.edu/resources/4-h_head_life_skills_sheets
- Minnesota 4-H. (2003). *Minnesota 4-H horseless horse project member handbook*. University of Minnesota.
- Morse, J. M. (2015). Data were saturated. *Qualitative Health Research*, 25(5), 587–588.
<https://doi.org/10.1177/1049732315576699>

- Nadeau, J., McCabe Alger, E., & Hoagland, T. (2007). Longitudinal study of the general knowledge of 4-H horse members. *Journal of Extension*, 45(5), Article 17. <https://tigerprints.clemson.edu/joe/vol45/iss5/17/>
- National 4-H Council. (2016). *4-H Common Measures Universal Survey*. <https://4-h.org/resources/professionals/common-measures/>
- Prechter, A., Arnold, S., & Perry, D. (2016). Influence of a horsemanship camp on youth leadership life skill development. *Proceedings of the 2016 Western Region AAAE Research Conference*, 17–33. <http://aaaeonline.org/>
- Richards, L. (2014). *Handling qualitative data: A practical guide* (3rd ed.). SAGE Publications.
- Rusk, C. P., Summerlot-Early, J. M., Machtmes, K. L., Talbert, B. A., & Balshweid, M. A. (2003). The impact of raising and exhibiting selected 4-H livestock projects on the development of life and project skills. *Journal of Agricultural Education*, 44(3), 1–11. <https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=c67844739027f99a157aa333a77a25d775135921>
- Scow, B., & Johnson, H. (2018). *Washington County 4-H: Horse lovers club proposal* [Grant]. Utah State University.
- Slocum, S. S. (2004). *A comparison of leadership life skills development of youth participating in riding and non-riding competitive 4-H horse events in Mississippi* (UMI No. 3120825) [Doctoral dissertation, Mississippi State University]. ProQuest Dissertations & Theses Global.
- Smith, C. E., Swinker, A. M., Comerford, P. M., & Radhakrishna, R. B., & Hoover, T. S. (2006). Horsemanship and life skills of youth in horse programs. *The Professional Animal Scientist*, 22(1), 89–93. [https://doi.org/10.15232/S1080-7446\(15\)31066-4](https://doi.org/10.15232/S1080-7446(15)31066-4)
- Smith, T., Genry, L., & Ketring, S. (2005). Evaluating a youth leadership life skills development program. *Journal of Extension*, 43(2), Article 12. <https://tigerprints.clemson.edu/joe/vol43/iss2/12/>
- Stake, R. E. (2006). *Multiple case study analysis*. Guilford.
- Walker, B. F. (2006). *The impact of beef cattle projects on youth leadership and life skill development* [Master's thesis, University of Georgia]. https://getd.libs.uga.edu/pdfs/walker_brandon_f_200612_mal.pdf
- Walls, L. L., & Denniston, D. (2003). Colorado distance horse bowl tournament. *Journal of Extension* 41(6). <https://archives.joe.org/joe/2003december/tt2.php>
- Washington County Extension. (2017). *Washington county 4-H horse guide*. Utah State University Extension.
- Washington County Extension. (2018). *Washington county horseless horse program leader guide*. Utah State University Extension.
- Washington State University Extension & U.S. Department of Agriculture. (2003). *Horses are fun: 4-H horseless horse project*. <https://pubs.extension.wsu.edu/horses-are-fun-4h-horseless-horse-project>

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Acknowledgment

The creation of the horseless horse program was supported by a grant from Utah State University Extension.

Lessons Learned Adapting and Implementing Another Organization's Program to Promote Healthy Aging

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Programming which promotes healthy aging may be lacking in states where nutrition and health interventions are directed earlier in life. Due to Maryland's increasing aging population, a team of 10 University of Maryland Extension Family and Consumer Sciences educators received permission to adapt and implement the Iowa Department of Public Health's, in partnership with the Iowa Department of Human Services and Department on Aging, Fresh Conversations program to fit the needs of Maryland's older adults. The purpose of this manuscript is not to discuss research findings but rather to share our challenges, successes, and recommendations for adapting and implementing another state's multi-session program to meet the needs of individual states' communities. Specifically, we discovered communicating with partnering sites, offering food tastings, accommodating various food cultures/traditions, following the original program design, and efficiently collecting data or programmatic form responses needed careful consideration. Despite the challenges we encountered, we expanded our national and state partnerships; reached 2,836 educational contacts across the state; and developed a detailed planning, implementation, and evaluation protocol and training, which is being used as a template for other statewide program efforts.

Keywords: Older adults, nutrition education, program planning and evaluation, adapting and implementing, lessons learned, college/community partnerships, Extension, chronic diseases

Introduction

Maintaining a healthy lifestyle is important to preserving our independence as we age. Older adults (OA) can be overlooked, as many nutrition and health education programs seek to intervene earlier in life. Maryland OAs are obese (31%), inactive (30%), have multiple chronic conditions (40%), and are at risk of social isolation (ranked 24th in the United States; United

Health Foundation, 2019). With Maryland's 60 and over population projected to increase by 40% from 2015 to 2030, the Maryland Department of Aging's (MDoA's) 2017-2020 Plan on Aging states:

To effectively reduce hospitalizations and nursing home institutionalization, significant efforts must be directed towards health promotion to keep Marylanders active and healthy... Reducing and managing chronic disease, encouraging healthy eating, and promoting regular exercise are just some of the changes necessary (Maryland Department of Aging, 2016, p. 4).

Fresh Conversations (FC), a research-tested, evidence-based direct and multi-session SNAP-Ed nutrition education program developed by the Iowa Department of Public Health in partnership with the Iowa Department of Health and Human Services and Department on Aging, was found to improve the nutritional status of OA who attended a minimum of four sessions (Boudreau, 2022; Iowa Department of Health and Human Services, n.d.; Lillehoj et al., 2018). MDoA approached University of Maryland Extension (UME) Family and Consumer Sciences (FCS) educators about adapting and offering FC to support healthy aging for Maryland's OA. University of Maryland Extension FCS educators are practical partners because we provide non-traditional and evidence-based education to meet the needs of vulnerable and/or underserved populations. In 2019, our team of 10 educators offered FC across 19 counties at 44 sites catering to OA. We facilitated 60-minute interactive sessions involving group discussions, hands-on activities, sampling low-cost healthy recipes, and goal setting. We received University of Maryland Institutional Review Board approval (1397895-1) to collect data from consenting individuals. Participants could also opt out of the research component and still participate in the program. The purpose of this manuscript is not to discuss research findings but rather to share our challenges and successes, leading to recommendations for adapting and implementing another state's program to meet the needs of Maryland's OA.

Challenges

We faced a variety of communication challenges at partnering sites, which may have affected program attendance. Five sites experienced site director turnover, which led to lower participation due to the interim directors' reduced advocacy of the program. When scheduling, educators were unaware of other concurrent events scheduled onsite, which competed for attendance. In addition, site staff did not always express when clientele required tailored support due to learning challenges or language barriers. Without adequate notice, we were unable to provide the necessary accommodations. At one site, staff support enabled those with learning disabilities to participate in the program, but they were excluded from the research.

When offering FC tasting activities, our team faced challenges in understanding and implementing variations among local food safety regulations. Counties/cities differed on requiring temporary food permits, food safety certification, and food preparation within a

certified kitchen. Some educators had to set up temporary food preparation spaces or renew their certified food manager certifications. Stricter regulations prevented others from offering tastings altogether. Inconsistencies among our team may have affected the research because not all participants received the same program experience.

Other adaptation challenges included consideration of participants' food culture. Racially, 90% of Iowa's residents identified as white, compared to 55% of Maryland residents (United States Census Bureau, 2019). Maryland's more racially diverse audiences were not always receptive or willing to prepare recipes that included unfamiliar ingredients (e.g., soy and almond milk) or cultural food taboos (e.g., mixing fish and beans). We faced challenges in deciding whether to make adaptations that fit cultural preferences or encourage trying new recipes.

Other obstacles included conducting individual sessions in accordance with the original program design. Sessions were intended to be offered monthly for 30-45 minutes. We discovered it took at least 60 minutes to cover all content and activities, encourage discussion, and assist participants with the evaluations or programmatic forms. Some educators were unable to schedule monthly sessions at their partnering sites, which created statewide inconsistencies. Educators who offered sessions monthly found participants did not always remember what was discussed the previous month or follow the health behavior change goal they set.

We encountered barriers when designing a plan for collecting evaluation and programmatic form responses. Our team and MDoA felt that the length of the original evaluation survey, participants' varying cognitive abilities, and limited time to complete surveys would result in reduced evaluation completion. Therefore, we received permission to shorten the evaluation from 102 to 41 questions. Collecting and handling research data at multiple sites also required assigning and maintaining coding sheets to protect participants' identities. Because participants could opt out of the study but still participate in the program, it was imperative that educators administered research or programmatic materials to the correct individuals. We realized early in the planning process that it would be challenging to efficiently implement a research study and program plan considering all of these factors.

Successes

These challenges provided valuable lessons and successes as our team built upon this pilot year and provided other evidence-based programming for MDoA. This effort increased our national partnerships and fostered a statewide collaboration between Maryland, the University of Maryland Extension, and local sites catering to OA. We are continuing this partnership and expanding the program delivery method by training site volunteers to implement FC. We reached 2,836 educational contacts and observed that participants enjoyed meeting to discuss relevant topics and taste new recipes. We updated our FCS food safety certification requirements for statewide consistency and to promote safe practices in future programming. To ensure consistent administration of research and program materials to the appropriate participants, our project

leader developed a detailed planning, implementation, and evaluation protocol and provided training to the educators. Our state utilizes this detailed protocol as a template for other statewide programs.

Lessons Learned

Despite the challenges outlined above, our team of 10 educators who planned and implemented the program had their own list of program recommendations. Once the program was completed, the team met and had a facilitated discussion and reached a consensus on recommendations. They adapted and gained valuable insight on how to offer FC and other organizations' program(s) within Maryland. For those considering another organization's program(s) for their communities, please see our recommendations summarized in Table 1.

Table 1. A Summary of Recommendations When Adapting and Implementing Other Organization's Program(s) for Local Communities

Completion Status	Recommendations
Communicating with Partnering Sites	
<input type="checkbox"/>	Request an additional point of contact or team at the site in case of turnover and to increase program advocacy.
<input type="checkbox"/>	Ask about potential schedule conflicts which might affect attendance and schedule around these.
<input type="checkbox"/>	Convey clear expectations regarding requests for reasonable accommodations. Ask staff to encourage participants to make these requests within the appropriate time frame.
<input type="checkbox"/>	Directly ask if clientele need additional support due to learning challenges. Assess whether the program curriculum or participation in research components is appropriate for these audiences.
Offering Food Tastings	
<input type="checkbox"/>	Become familiar with county/city food safety regulations in advance, and decide how statewide inconsistencies may affect research being conducted and the participants' experience.
<input type="checkbox"/>	If not already built in, consider alternative activities and how this might affect research being conducted and the integrity of the program.
<input type="checkbox"/>	Consider having all educators participate in food safety training and certification when a curriculum contains a demonstration or tasting activity to promote the safety of participants, especially vulnerable audiences.

Completion Status	Recommendations
Accommodating Food Cultures	
<input type="checkbox"/>	Know your area's racial and ethnic breakdown, and research culturally equivalent substitutions or adaptations to increase receptivity and willingness to try new recipes.
<input type="checkbox"/>	Reach out to respected leaders within cultural pockets of the community to learn how to encourage trying new recipes.
Following the Original Program Design	
<input type="checkbox"/>	Build in extra time to accommodate group discussions, activities, or survey/form completion, which may extend the program past its intended time frame.
<input type="checkbox"/>	Determine whether the original program frequency is appropriate for clientele.
<input type="checkbox"/>	Brainstorm creative ways which help participants remember past content and encourage commitment to their health behavior change goal, especially if sessions are spaced weeks apart. For example, give out incentives or build in time for participants to share their experiences.
Collecting Data or Programmatic Form Responses	
<input type="checkbox"/>	Determine if the length of the evaluation survey and the time allotted to take the survey are appropriate for audiences.
<input type="checkbox"/>	Create a detailed protocol and train educators to ensure efficient, appropriate handling of data. Include instructions for program participants who are not participating in the research component so that evaluations and programmatic forms are appropriately distributed to the correct individuals.

Conclusion

If a group plans to replicate another organization's program, adaptations may be needed to meet a new target audience's needs. The authors hope the recommendations can help identify where adaptations may be considered. Each educator and respective organization learned a lot through adapting Fresh Conversations from Iowa to Maryland's implementation, which has allowed the program to continue and expand since 2019.

References

Boudreau, H. (2022, April 19). Fresh Conversations: More than just a program about nutrition and physical activity. *United States Department of Agriculture SNAP-Ed Connection*. <https://snaped.fns.usda.gov/success-stories/fresh-conversations-more-just-program-about-nutrition-and-physical-activity>

- Iowa Department of Health and Human Services. (n.d.). *Fresh Conversations*.
<https://hhs.iowa.gov/inn/fresh-conversations>
- Lillehoj, C. J., Yap, L., Montgomery, D., Shelley, M., & Francis, S. L. (2018). Nutritional risk among congregate meal site participants: Benefits of a SNAP-Ed program. *Journal of Nutrition in Gerontology and Geriatrics*, 37(3-4), 204–217.
<https://doi.org/10.1080/21551197.2018.1516592>
- Maryland Department of Aging. (2016). *2017-2020 state plan on aging*.
https://aging.maryland.gov/Documents/MDStatePlan2017_2020Dated092216.pdf
- United Health Foundation. (2019). *America's health rankings: Maryland (2019 senior report)*.
https://www.americashealthrankings.org/explore/senior/measure/outcomes_sr_2/state/MD?edition-year=2019
- United States Census Bureau. (2019). *2019 American Community Survey single-year estimates*.
<https://www.census.gov/newsroom/press-kits/2020/acs-1year.html>

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Acknowledgments

This project was funded through University of Maryland Extension, Family and Consumer Sciences, and Healthy Living project funds. We have no known conflict of interest to disclose.

We wish to acknowledge the Iowa Department of Public Health, in partnership with the Iowa Department of Human Services and Department on Aging, for granting us permission to adapt and implement their program, Fresh Conversations. We would also like to thank the Maryland Department of Aging and local sites catering to older adults for collaborating with UME on this effort and to all those who participated in this program.

Mental Health First Aid Training in Rural Maryland during the COVID-19 Pandemic: Program Implementation through Virtual Delivery

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The growing mental health concerns during COVID-19, particularly among rural residents, is a public health emergency. Rural residents are at an elevated risk, as rurality has been associated with various disparities, including lower accessibility to mental health services. Maryland Rural Opioid Technical Assistance (ROTA; Maryland Extension) aimed to address this issue by delivering evidence-based programs on opioid misuse and mental health to rural community members and practitioners throughout Maryland when the COVID-19 pandemic hit the U.S. and all research activities had to transition to the virtual setting. The current study provides an overview of the implementation process of the Mental Health First Aid (MHFA) program and reports the findings from the evaluation efforts. Participants (N = 398) completed a one-time online survey and answered open-ended questions, reporting high satisfaction rates and positive experiences with the virtual delivery of the program. Results suggested that the virtual format was still effective in program content delivery and that virtual delivery of evidence-based programs may be an opportune strategy to reach more rural residents. Recommendations for future research and practice efforts include building sustainable partnerships with local community organizations and considering rurality and prolonged-pandemic factors for effective program implementation.

Keywords: Mental Health First Aid, mental health, rural population, program implementation, virtual delivery, COVID-19

Introduction

The COVID-19 pandemic has deeply affected the everyday lives of all Americans. Not only has the pandemic presented us with grim statistics of confirmed cases and deaths due to the virus, but it has also taken a heavy toll on mental health. Elevated levels of adverse mental health symptoms, including anxiety, depression, and trauma- and stressor-related disorder (TSRD), have been observed in the U.S. during the pandemic (Czeisler et al., 2020). Moreover, an analysis of national emergency department visits showed that the visit rates for suicide attempts and drug overdoses were higher in 2020 than in 2019 (Holland et al., 2021). Such indicators underscore the need to prioritize screening and prevention efforts for mental health as part of the response to the ongoing pandemic.

In particular, the negative impact of COVID-19 is of special concern in rural communities, where disparities in mental health predate the pandemic. For example, rural suicide rates increased faster than urban suicide rates from 2000 through 2018, with the rate being nearly 1.5 times higher in rural compared to urban areas in 2018 (Petrone & Curtin, 2020). Experts have pointed to several system-level factors, namely availability, accessibility, affordability, and acceptability of services, contributing to this health disparity (Jensen & Mendenhall, 2018; Wilson et al., 2015). Additionally, social isolation is one of the risk factors more commonly experienced among rural residents; recent social practices associated with COVID-19 (e.g., physical distancing, restricted in-person gatherings) can exacerbate such social risk factors for mental health challenges (Monteith et al., 2020; Summers-Gabr, 2020). Reducing any shame associated with mental health issues in rural communities is critical in seeking and providing appropriate resources. With such pre-existing mental health disparity and other system-level challenges, rural residents are at a heightened mental health risk during the pandemic.

One approach to addressing the mental health needs in rural communities is to increase the community's capacity to understand, recognize and address mental health challenges. Mental Health First Aid (MHFA), an evidence-based training course for the general public (Jorm et al., 2019), has been identified as an appropriate program to help improve rural mental health and treatment use (Talbot et al., 2017). The program offers basic mental health knowledge and teaches skills to assist people in coping with mental health challenges or getting connected to resources. The program is considered particularly pertinent to the rural context, as the program goals align well with some of the key rural mental health needs, such as reducing mental health stigma through improved mental health literacy, promoting healthy discussions of mental health issues, and empowering individuals to seek treatment or offer resources to others when necessary (El-Amin et al., 2018).

While there is extensive research on the effectiveness of MHFA (Hadlaczky et al., 2014; Morgan et al., 2018), relatively little is reported on the virtual delivery format of this evidence-based program. Studies involving an e-learning format of the MHFA curriculum do suggest that the virtual delivery of the training is effective as well. Jorm et al. (2010) conducted a randomized controlled trial and found that participants who received MHFA information via an e-learning CD or a manual showed reduced stigma and increased mental health knowledge, with the CD group taking more first aid actions than the waiting list group. Reavley et al. (2018) also conducted a randomized controlled trial involving both e-learning and blended (e-learning plus face-to-face) formats, and they found that both versions had positive effects compared to the control group on mental health knowledge, intention and confidence in helping a person, and personal stigma. There were minimal differences between the blended and e-learning versions, but course satisfaction ratings were higher for the blended course. A one-year follow-up showed that the blended course led to greater improvements in knowledge, confidence, and intentions to help a person compared to the e-learning course (Reavley et al., 2021). Overall, these findings suggest that the virtual delivery format can have similar positive effects as the in-person format.

With the ongoing COVID-19 pandemic, there has been a rapid increase in both the need for and delivery of virtual programs; nearly every community outreach effort, including delivering evidence-based programs, has transitioned in varying degrees to remote settings. We also adapted to the pandemic restrictions and delivered the MHFA program completely virtually. The primary objectives of this study are to share our experiences in implementing MHFA virtually during the pandemic in rural Maryland communities, present some evaluation outcomes from the participants, and offer implications for practitioners, researchers, and other community workers in rural settings.

Methods

The Maryland ROTA Project

Maryland Rural Opioid Technical Assistance (ROTA) is part of an initiative funded by the Substance Abuse and Mental Health Services Administration (SAMHSA) and was established by the Maryland Extension in partnership with local and state organizations. The program model includes elements that address multiple levels of a spectrum of prevention (Cohen & Swift, 1999). Specifically, Maryland ROTA's programming promoted community education through group workshops on various topics related to the opioid crisis. The program model also included training of trainers in curricula such as Mental Health First Aid. The program fostered coalitions and networks by building partnerships with public health and substance use prevention stakeholders across the state. Finally, the program made overtures at changing organizational practices and influencing policy and legislation through its anti-stigma efforts in collaboration with the state Department of Health. By delivering training and technical assistance, Maryland

ROTA aimed to strengthen the ability of rural communities in Maryland to help understand and respond to the opioid epidemic.

MHFA Program Outlines and Expected Outcomes

Mental Health First Aid (MHFA) was originally designed as an 8-hour, in-person workshop to train individuals in assisting others who experience mental health or substance use-related crises. In this training, participants learn about the risk factors and warning signs for mental health and substance use concerns, action plans for helping someone in crisis and non-crisis situations, and additional resources they can share with those experiencing mental health and substance use challenges. Detailed studies and review articles have been published on MHFA's impact on public awareness and knowledge about mental health, stigma towards mental illness, and self-efficacy in helping ("first aid") behaviors (Hadlaczky et al., 2014; Morgan et al., 2018). A meta-analysis study of evaluation studies reported that participants showed increased knowledge in the identification of mental health problems and knowledge about effective treatment options, more positive attitudes toward individuals with mental illness, and an increased number of times offering support to another person with mental health problems (Hadlaczky et al., 2014). Additionally, a follow-up assessment of Extension agents working in rural communities showed that over 60% of the agents were using the skills (e.g., listening non-judgmentally, having a conversation about mental health) learned from the MHFA training in both work-related and non-work-related settings (Robertson et al., 2021).

MHFA Program Implementation of Virtual Delivery

The implementation of MHFA was conducted entirely online during the COVID-19 pandemic. The National Council for Mental Wellbeing (National Council) had been developing an updated version of the MHFA curricula, titled MHFA 2.0, with intentions of offering a blended/hybrid training format in April 2020. The new delivery option appealed to instructors because it offered a shorter workshop experience supplemented by self-paced pre-work to be completed by the participant. These plans were delayed due to the onset of the pandemic, which led to necessary adjustments allowing for an all-virtual delivery option. Instructors were trained in the standard in-person delivery format and were provided with a supplemental training webinar to prepare them for the online delivery of the course. The additional training outlined protocols for assisting participants triggered by course discussions, technical guidance for utilizing the Zoom platform, tips for conducting workshop activities in a virtual environment, and specifics regarding the procurement of digital materials for participants.

In July 2020, the National Council launched multiple program delivery options to remain flexible as instructors navigated pandemic restrictions. Instructors were permitted to offer the 2016 MHFA curriculum in in-person, blended, or virtual-only formats using the updated MHFA 2.0 curriculum. In-person delivery required instructors to provide participants with manuals purchased from the MHFA website, compile participant rosters in the MHFA instructor portal,

and deliver the class as an 8-hour workshop. Participants complete all necessary work during the in-person workshop, including pre-and post-testing and evaluations, to receive their certificates. Upon completing the course, instructors were then required to update attendance rosters in the instructor portal to officially register class members as certified Mental Health First Aiders.

In contrast, the blended and virtual delivery formats demand only 5.5 hours of live training because participants complete two hours of independent, self-paced pre-work prior to the live session. The pre-work served to lay a foundation regarding the impact of mental health challenges, the importance of early intervention, and the role of the mental health first aider.

Procedures for both blended and virtual were essentially the same, apart from the skills application workshop portion being conducted via Zoom for virtual-only delivery or in-person as required by the blended format. Instructors were required to create the course in the learning management system, collect registrations, enter all registered participants into the system, and purchase digital access for each participant in advance. Once enrolled, registered participants received access to the online learning management platform, prompting them to complete pre-work before attending the skills application workshop.

The 5.5-hour workshops focused on a review of the foundational materials, coupled with practice scenarios, where participants could apply the skills learned in the course. After the course, instructors were required to submit attendance while participants were instructed to return to the learning management system to complete the final steps. The final steps included a quiz and a course evaluation for the participant. Instructors were required to monitor this process and provide technical assistance to participants when needed, utilizing the National Council's support staff. Despite attempts to return to normalcy, the National Council offers instructors all three delivery format options in light of pandemic uncertainty.

Participants and Recruitment

Participants in the MHFA training were recruited in a variety of ways. Due to the specific aims of the grant-funded Maryland ROTA project, a substantial number of participants were recruited through direct marketing towards industry professionals in the area of substance use treatment and prevention (e.g., peer support professionals, caseworkers, and public health educators). We created and maintained a website with information on upcoming events and distributed monthly e-newsletters to the partners using our constantly updated listserv. We utilized social media (i.e., Facebook, Instagram) by uploading events and information flyers. Furthermore, the ROTA project developed several partnerships with behavioral health providers and non-profit groups in rural areas of Maryland. These health providers and non-profits would advertise MHFA workshops offered by ROTA to their client base. Finally, ROTA held a variety of public information sessions, where information about the opioid crisis in Maryland was shared, and the calendar of publicly available MHFA training sessions were advertised.

Data Collection

Online evaluation surveys were administered at the end of each session (post-event) and one month after the event (one month follow-up) to assess the program implementation. For the post-event assessment, the educators provided the anonymous link to the online survey using the chat function in Zoom and encouraged the participants to complete it. For the one month follow-up assessment, the data manager distributed the online survey via participants' email addresses, which were collected as part of the registration process.

Measures

Demographics

Participants' demographic information, including gender, race/ethnicity, education level, and primary profession, was collected post-event.

Evaluation

Post-event, participants were asked the following questions to assess the evaluation of the MHFA course: satisfaction ("How satisfied were you with the overall quality of this event?"), benefit ("I expect this event to benefit my professional development and/or practice."), and application ("I will use the information gained from this event to change my current practice."). Each of these one-item measures was on a 5-point Likert scale, ranging from *very satisfied* to *very dissatisfied* for the satisfaction measure and from *strongly agree* to *strongly disagree* for the benefit and application measures. Additionally, participants were asked whether they would recommend this event to a colleague (*yes* or *no*).

At follow-up, participants were asked the following questions: benefit ("The information from this event has benefited my professional development and/or practice."), application-current ("I have used the information gained from this event to change my practice."), and application-future ("I expect to continue using the information from this event in my future work."). These one-item measures were also on a 5-point Likert scale, ranging from *strongly agree* to *strongly disagree*. Participants were also asked whether they had shared the information gained from this event with their colleagues (*yes* or *no*). These items are from the Government Performance and Results Act (GPRA) post-event and follow-up surveys, which are provided by SAMHSA for their Technology Transfer Center (TTC) events.

Open-Ended Questions

As part of our efforts to incorporate participants' feedback and improve on our program implementation, we included four open-ended questions to the follow-up survey: (1) what about the event was most useful in supporting your work responsibilities, (2) what has improved in

your organization/practice because of this event, (3) how can Maryland ROTA improve its events, and (4) what learning format for the events would you suggest to be offered.

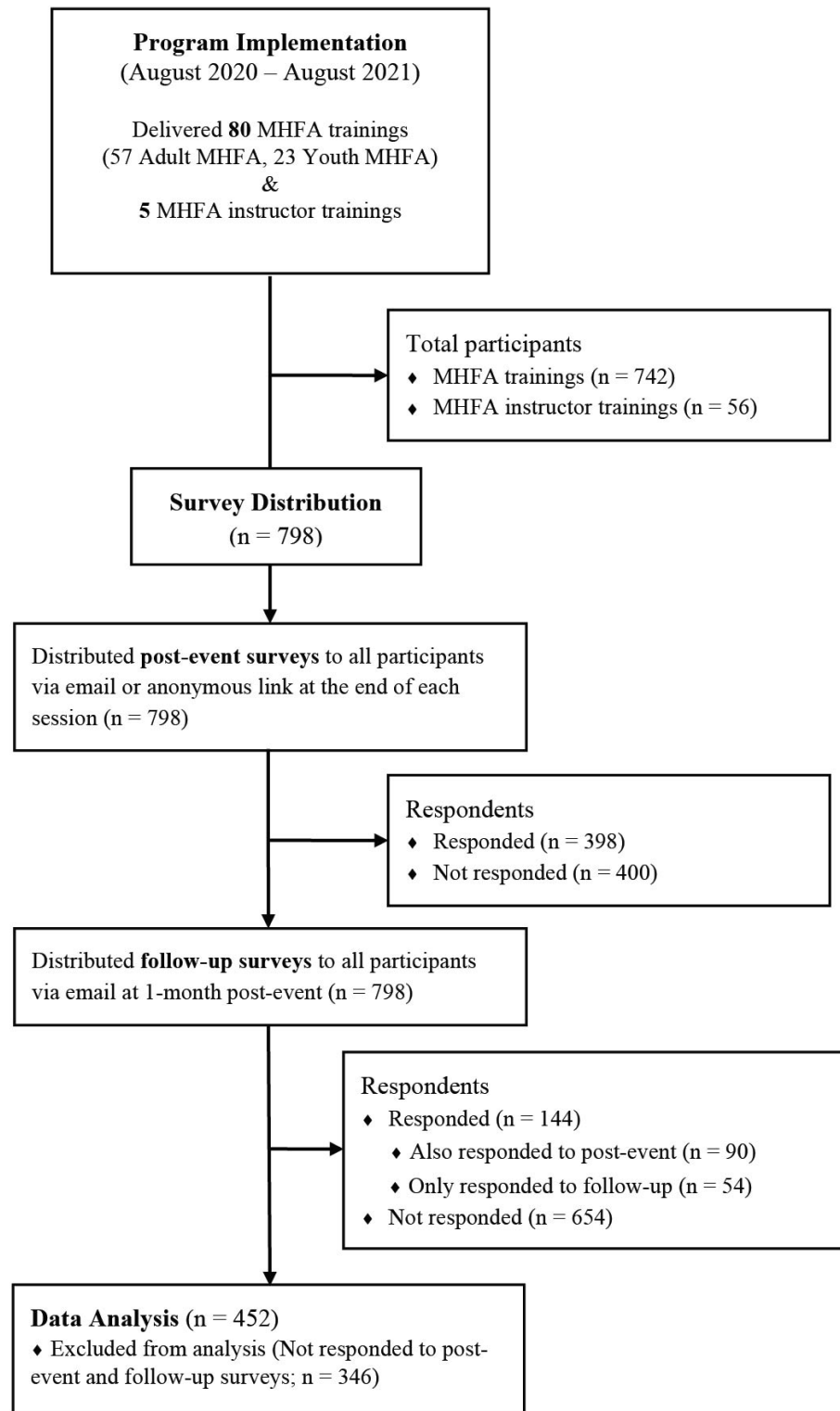
Data Analysis

Participant post-event and follow-up responses were analyzed using IBM SPSS Statistics (Version 28) analytics software. Demographic data and program evaluation measures were summarized using descriptive statistics, including means and standard deviations. A paired *t*-test analysis was used to assess the difference in mean scores on the evaluation measures between post-event and follow-up. An inductive thematic analysis process was used (Braun & Clarke, 2006) to generate codes and themes from the entire dataset. First, the comments were compiled so that they could be read in their entirety. Next, the first author read and re-read the responses multiple times to familiarize himself with the data. The first author then conducted an initial coding of the themes for each open-ended question, grouping the codes into several categories. Upon reviewing the initial codes and themes with the other authors, several of the themes were consolidated into overarching categories for reporting. These categories are detailed in the results section. The qualitative analysis was conducted using Nvivo (QSR International, Version 12).

Results

Program Reach

Between August 2020 and August 2021, our team delivered 80 MHFA sessions (57 Adult MHFA, 23 Youth MHFA) and five MHFA instructor training sessions. We reached 742 participants for the regular MHFA sessions and 56 trainers for the MHFA instructor training sessions. These trainings were made possible with six trained instructors from our team and five trained instructors who partnered with us to help co-teach the sessions. Figure 1 provides an overview of the participant flow across program implementation, data collection, and data analysis.

Figure 1. Participant Flow Diagram

Demographic Characteristics of the Participants

Table 1 displays the demographic characteristics of the participants. A total of 398 participants responded to the post-event surveys, 90 (22.6%) of whom also responded to the one month follow-up surveys. Most of them were females ($n = 322$; 80.9%), followed by males ($n = 72$; 18.1%) and transgender or none of these genders ($n = 2$; 0.6%). The sample was predominantly White ($n = 270$; 67.8%), with others identifying as Black or African American ($n = 83$; 20.9%), Asian ($n = 12$; 3.0%), Hispanic or Latino ($n = 17$; 4.3%), or more than one race ($n = 10$; 2.5%). The majority of the participants had a bachelor's ($n = 105$; 26.4%) or a higher degree (master's or doctoral degrees; $n = 150$; 37.7%). Additionally, 54 participants responded only to the one month follow-up surveys. Since the demographic information was only collected during the post-event survey, the demographic characteristics of those who only responded to the follow-up surveys are not available.

Based on the zip code information ($n = 384$), we served participants from all counties in Maryland ($n = 362$) except Kent County, and we had some participants joining from other states as well ($n = 12$). Most ($n = 305$; 84.3%) of the participants in Maryland were from a rural county, according to the categorization of the Rural Maryland Council (*The Rural Maryland Council*, 2013). The counties with the highest number of participants were Allegany ($n = 47$; 13.0%), Wicomico ($n = 42$; 11.6%), St. Mary's ($n = 39$; 10.8%), and Washington ($n = 38$; 10.5%) counties.

Table 1. Sample Characteristics by Survey Completion, $N = 398$

	Total ($N = 398$)	Post-Test Only ($n = 308$)	Post-Test & Follow-up ($n = 90$)	p-value from χ^2 test (Post only vs. Post-Follow- up)
Gender, n (%)				.458
Male	72 (18.1%)	51 (16.6%)	21 (23.3%)	
Female	322 (80.9%)	253 (82.1%)	69 (76.7%)	
Transgender	1 (0.3%)	1 (0.3%)	0 (0.0%)	
None of these	1 (0.3%)	1 (0.3%)	0 (0.0%)	
Race, n (%)				.685
White	270 (67.8%)	206 (66.9%)	64 (71.1%)	
Black or African American	83 (20.9%)	66 (21.4%)	17 (18.9%)	
Asian	12 (3.0%)	11 (3.6%)	1 (1.1%)	
Hispanic or Latino	17 (4.3%)	12 (3.9%)	5 (5.6%)	
More than One race	10 (2.5%)	8 (2.6%)	2 (2.2%)	
Education, n (%)				.187
High School Diploma or Equivalent (GED)	35 (8.8%)	25 (8.1%)	10 (11.1%)	
Some College (no degree)	59 (14.8%)	47 (15.3%)	12 (13.3%)	
Associate's	40 (10.1%)	30 (9.7%)	10 (11.1%)	

	Total (<i>N</i> = 398)	Post-Test Only (<i>n</i> = 308)	Post-Test & Follow-up (<i>n</i> = 90)	p-value from χ^2 test (Post only vs. Post-Follow- up)
Bachelor's	105 (26.4%)	80 (26.0%)	25 (27.8%)	.006
Master's	120 (30.2%)	99 (32.1%)	21 (23.3%)	
Doctor of Pharmacy (PharmD)	4 (1.0%)	2 (0.6%)	2 (2.2%)	
Other Doctoral Degree or Equivalent (e.g., PhD, EdD, DPT)	26 (6.5%)	16 (5.2%)	10 (11.1%)	
Other	6 (1.5%)	6 (1.9%)	0 (0.0%)	
Primary Occupation, <i>n</i> (%)				
Social Services – General	94 (23.6%)	81 (26.3%)	13 (14.4%)	
Social Services – Mental Health	69 (17.3%)	46 (14.9%)	23 (25.6%)	
Educator	88 (22.1%)	61 (19.8%)	27 (30.0%)	
Students	45 (11.3%)	36 (11.7%)	9 (10.0%)	
Medical / Healthcare Provider	17 (4.3%)	12 (3.9%)	5 (5.6%)	
Other (Law, Administration, etc.)	80 (20.1%)	69 (22.4%)	11 (12.2%)	

Post-Event and Follow-up Sample Characteristics

As the proportion (22.6%) of participants who completed both the post-event and follow-up surveys was fairly low, we examined whether there were any differences in demographic characteristics and evaluation ratings between those who completed both the post-event and follow-up surveys ($n = 90$) and those who only completed the post-event survey ($n = 308$). Crosstabs of different demographic characteristics, including gender, race, education level, and primary profession, showed that the participants differed significantly in their primary professions ($p = .006$). Educators (30.7%) and those who work in social services related to mental health (26.1%) made up the majority of those who completed both the post-event and follow-up surveys, whereas those who work in the general social services field (26.6%) and other fields (i.e., law, administration, etc.; 22.6%) were represented more in the group that only completed the post-event survey (see Table 1). For the main evaluation ratings, we did not find any significant differences in scores for satisfaction, benefit, and application between those who completed both the post-event and follow-up surveys and those who only completed the post-event survey.

Program Evaluation

The participants' overall evaluation of the MHFA course was very positive. Among those who completed the post-event survey ($N = 398$), 93.5% ($n = 372$) of the respondents were satisfied or very satisfied with the overall quality of the event, 94.0% ($n = 374$) agreed or strongly agreed that they expected the event to benefit their professional development and/or practice, and 86.4% ($n = 344$) agreed or strongly agreed that they would use the information gained from the event to

change their current practice. Additionally, 97.2% ($n = 387$) of the participants responded that they would recommend the event to a colleague.

Among those who completed the one month follow-up survey ($N = 144$), 95.8% ($n = 138$) agreed or strongly agreed that the information from the event had benefited their professional development and/or practice, 81.3% ($n = 117$) agreed or strongly agreed that they had used the information gained from the event to change their practice, and 97.2% ($n = 140$) agreed or strongly agreed that they expected to continue using the information from the event in their future work. Moreover, 73.6% ($n = 106$) of them said they had shared the information gained from the event with their colleagues.

Post-event and Follow-up Evaluation

Based on the participants who completed both the post-event and follow-up surveys ($N = 90$), there was a significant decrease in the evaluation measures at follow-up. For example, the mean agreement score for the statement on benefit (i.e., “I expect this event to benefit my professional development and/or practice.”) decreased from 4.73 ($SD = .58$) at post-event to 4.49 ($SD = .59$) at follow-up (i.e., “The information from this event has benefitted my professional development and/or practice.”; $p = .003$), and the mean agreement score for the statement on applying the information (i.e., “I will use the information gained from this event to change my practice.”) decreased from 4.51 ($SD = .76$) at post-event to 4.17 ($SD = .83$) at follow-up (i.e., “I have used the information gained from this event to change my practice.”; $p = .001$). Among those who said they would recommend this event to a colleague ($n = 90$), 73.3% ($n = 66$) reported that they had shared the information gained from the event with their colleagues.

Open-Ended Feedback Results

Responses to the open-ended questions were grouped and analyzed for key themes. The questions and themes found from the participants’ responses are displayed in Table 2.

Usefulness of the Course

Four themes were identified using the 120 responses to the open-ended question asking what was most useful about the event in supporting work responsibilities. The most common type of response ($n = 51$) was gaining more knowledge and awareness about mental health. Participants felt more aware and knowledgeable in identifying signs and symptoms of mental health challenges. They found the information on available resources and their role as a first-aider helpful. The next most common type of response ($n = 41$) was on learning and applying the “how to” skills in the workplace and everyday lives. These participants mentioned making changes to their interactions, including active listening or using appropriate terms, and some also described incorporating the assessment tools in their workplace. Additional themes were the quality of the

presentation ($n = 11$) and other mixed responses (e.g., being MHFA certified, everything, N/A; $n = 17$).

Change in Organization or Practice

When asked what has improved in their organization or practice because of the event, the most common type of response ($n = 30$) was having more positive attitudes towards mental health. Many described being more empathetic and perceptive of others, and they felt more confident in stepping in to support mental health challenges. Being more knowledgeable about mental health issues ($n = 21$) was also a common theme. Participants appreciated having a better understanding of mental health challenges and knowing how to interact with clients or deal with situations. Some described more specifically changing their behavior or practice due to the event ($n = 23$). Examples include having better practices around supporting clients' active mental health episodes, engaging with students differently by using the tips learned, being a better listener, and using person-centered language. Additional responses ($n = 14$) included having more community partnerships, improving their mental health, or not yet having tangible changes.

Things to Improve about the Program

Participants were also asked whether our team could improve our events in any way. Most didn't have any suggestions ($n = 51$), mostly because they thought our events were great but also because they couldn't think of anything. Participants also provided various suggestions on course procedures or mode of delivery ($n = 21$), including wanting more opportunities for small group discussions, attending the event in person, or breaking down the event into shorter sessions. Publicity and offering more sessions were also important factors ($n = 11$), where participants wanted more sessions to be offered to a broader audience, and they wanted to hear about them.

Preference in Learning Format

When asked whether they had any suggestions for the learning format of the events, most participants expressed their preference for the virtual format ($n = 33$) or had no preference ($n = 31$). Participants who preferred the virtual format expressed that the format was most appropriate considering the pandemic situation and meeting virtually allowed participants from different counties to attend the sessions (e.g., "virtual works very well unless training is coming to western Maryland," "I would not have been able to attend the event if it was in-person"). They generally thought the virtual format worked well, where they were given access to the course material in advance and were still able to have a face-to-face discussion via Zoom. Fewer participants expressed their preference for the events to be in-person ($n = 8$) or hybrid ($n = 8$).

Table 2. Themes from the Open-Ended Questions

Question	Themes	Sample Responses
What about the event was most useful in supporting your work responsibilities?	Gaining Knowledge & Awareness (<i>n</i> = 51)	<ul style="list-style-type: none"> • Better understanding of how mental health and opioid use go hand in hand • Knowing more about available resources and what to do in various situations
	“How to” Skills / Applicability (<i>n</i> = 41)	<ul style="list-style-type: none"> • A lot of things that I can apply to my current job and things to look for • Communication strategies and redeveloping my own terminology • How to apply the information to effectively work with youth
	Presentation (Content, Discussion, Presenters, etc.) (<i>n</i> = 11)	<ul style="list-style-type: none"> • The online videos prior to the in-person event were interesting and informative, and the in-person event was engaging and informative. Both provided good reminders and some new tips • The rich discussion has been food for thought and shaped how I implement the strategies in my work
	Misc (MHFA Certified N/A, etc.) (<i>n</i> = 17)	<ul style="list-style-type: none"> • Being able to provide MHFA training in my community • N/A
What has improved in your organization/ practice because of this event?	More Knowledgeable about MH Issues (<i>n</i> = 21)	<ul style="list-style-type: none"> • Great knowledge on how to handle mental health challenges and crises • I know more warning signs of someone struggling with mental health
	More Positive Attitude towards MH (<i>n</i> = 30)	<ul style="list-style-type: none"> • Being more empathetic and perceptive of others • Feeling comfortable talking to people about their mental health
	Changes in Behavior/ Practice to Support MH (<i>n</i> = 23)	<ul style="list-style-type: none"> • I engage with students by using some of the tips I learned • I have been better able to assist people with mental health-related issues. • Listening non-judgmentally and how to encourage help
	Misc. (Community partnership, etc.) (<i>n</i> = 14)	<ul style="list-style-type: none"> • Increased community partnerships • My mental health
	None/Not yet/N/A (<i>n</i> = 19)	<ul style="list-style-type: none"> • Hard to answer now with everyone working from home
How can the TTC Network (Maryland ROTA) improve its events?	None (Everything was great) or N/A (<i>n</i> = 51)	<ul style="list-style-type: none"> • Continue what you are doing • Nothing, I thought it was great
	Suggestions for Content (<i>n</i> = 10)	<ul style="list-style-type: none"> • For me, I would have liked it if the examples were more specific to my particular setting of a school • Maybe have some for specific occupational fields?

Suggestions on Course Procedures (<i>n</i> = 21)		<ul style="list-style-type: none"> • A little more time for discussion maybe. Also added time for more role-play and “practice.” • Encourage cameras on, full participating in Zoom events • Present a quiz in which there are different scenarios where the participant has to choose how to respond and what to do
	More Offerings & Publicizing (<i>n</i> = 11)	<ul style="list-style-type: none"> • By reaching out to community-based organizations • Getting this training out to a broader group would help • More marketing! I wouldn't have known about it if I wasn't notified through personal email.
What learning format for the events would you suggest to be offered?	In-person (<i>n</i> = 8)	<ul style="list-style-type: none"> • In-person if possible, but online is good too • When it becomes possible, in house
	Virtual (<i>n</i> = 33)	<ul style="list-style-type: none"> • Remote is key for now because of the immuno-sensitive / compromised • Stick with online because most of us in Maryland have to travel • Virtual options are a great way for more people to participate
	Hybrid (<i>n</i> = 8)	<ul style="list-style-type: none"> • Hybrid - virtual for foundational learning, in-person small group discussion
	Misc. (No preference, N/A) (<i>n</i> = 30)	<ul style="list-style-type: none"> • Any available • As much emphasis on the discussion as possible

Discussion

Positive Evaluation of MHFA

The overall evaluation of the MHFA virtual sessions was very positive. Most participants were satisfied with the overall quality of the event, which was also supported by the fact that almost every participant said they would recommend the event to a colleague. Participants also found the information gained from the session to be beneficial and applicable to their professional development and practice. Specifically, they described gaining more knowledge about mental health, such as issues that youth may be experiencing or substance misuse that often co-occur with mental health challenges and their role as a first-aider, which included identifying signs and symptoms or initiating conversations about mental health support. These results are consistent with previous findings indicating the program's effectiveness in increasing mental health knowledge and confidence in helping a person with a mental health problem (Hadlaczký et al., 2014; Morgan et al., 2018). Our findings also support Reavley et al.'s (2018, 2021) study that showed the effectiveness of the virtual format of the training and how it was positively received by the participants.

It is important to note that while such positive evaluation scores at post-event statistically significantly decreased at one month follow-up among those who completed both surveys, the ratings remained considerably high at follow-up, with all measures having scores higher than 4 out of 5. Among those who completed the follow-up survey, more than 95% of the participants agreed that the information from the event had benefited their professional development and practice, and more than 80% of them reported that they had used the information gained from the event to change their practice. These findings suggest the positive impact that MHFA has on participants is mostly sustained one month after the event, and many participants were able to immediately apply the knowledge and skills learned during the session to their practices. Such findings support the previously well-established literature that demonstrates MHFA's effectiveness in increasing participants' knowledge of mental health, competence in supporting difficult situations, and decreasing stigma (McCormack et al., 2018, Morgan et al., 2018).

Applying the Program Content in Their Practices

In their qualitative responses, participants articulated ways that they incorporated the information gained from the event into their practices. These included attitudinal changes, such as feeling more confident in supporting mental health needs and being more mindful in their daily interactions. There were behavioral changes as well, where participants described including a procedure in their practice routines (e.g., trauma-informed program planning, asking patients directly whether they thought about suicide) or having more conversations about mental health in the workplace. These are meaningful findings in that participants were reporting concrete examples of changes made as a result of attending the MHFA sessions, and such examples of application supplement the quantitative measures in demonstrating the benefits of delivering evidence-based programs. Further analysis of the qualitative comments provided by participants revealed that the program was perceived as useful in a variety of ways across professional groups. This information is helpful for practitioners aiming to scale up their implementation of MHFA because it supports the broad applicability of the program. Notably, these professional categories included healthcare professionals who may have already had some familiarity with mental health topics from prior training or education. This suggests that the information contained in MHFA may be useful as part of ongoing education for a variety of allied health professionals in addition to the general public.

Fully Virtual Delivery as a Stopgap Measure

Before the pandemic, MHFA had not been delivered in a fully virtual format. However, the need for mental health services remained comparatively high during the pandemic (Czeisler et al., 2020). The ability to pivot toward fully virtual delivery placed the skills to respond to mental health challenges and crises in more people's hands at a time when they needed it the most. Furthermore, when asked about their preferences, a large percentage of participants remarked that virtual delivery was their preferred method of receiving MHFA instruction. This is important

feedback, especially for delivery to audiences in sparsely populated regions. Long driving distances to a site for in-person instruction may pose barriers to attendance, which virtual delivery overcomes. By providing this training to a variety of residents and service providers in rural areas, the potential for an indirect reach of our programming grew. Each service provider reaches even more people in their daily work than we could reach via our own virtual delivery scheme. In this way, our pivot to virtual programming combined with our recruitment strategies helped us meet particularly high demand for mental health support in underserved communities during a highly stressful period.

One of the many benefits of MHFA online delivery was increased participation due to ease of access. Online training proved desirable for many as it removed geographic barriers, eliminated travel expenses, eliminated weather-related travel concerns, and ultimately saved time. This appeared particularly true for MHFA participants, given that before the pandemic and the MHFA 2.0 update, classes required a full-day commitment outside of the office or home. The addition of independent pre-work as a prerequisite to the live workshop also proved to be very helpful. All participants entered the workshop with a foundational knowledge of mental health issues and MHFA strategies. This foundational knowledge allowed for more robust conversations throughout the workshops.

Adjusting to this virtual format was not without challenges, as instructors were forced to become adaptable to many situations that were previously of no concern. Instructors had to develop intuitive abilities when managing their workshops so that all participants felt supported and cared for should someone feel triggered by the subject matter. In addition to adjusting how instructors “read a room,” it was evident that there will always be those who simply attend without engaging in the activities with virtual delivery. The virtual delivery format also required more administrative action on instructors as multiple online platforms were needed to create courses, complete attendance records, purchase materials, and track evaluations.

Limitations of the Present Study

The present study has some noteworthy limitations. First, our data do not include assessments of specific helping behaviors engaged in by the participants. Our measure of application is global and only asks whether participants have applied or plan to apply what they learned in the MHFA courses. Second, the study follow-up period is rather short, at only one month post-course. Follow-up data at longer intervals would strengthen our findings. Finally, the present study does not include measures of specific changes in participants’ knowledge or attitudes. However, there are extant studies that provide evidence for these changes in virtual delivery (Jorm et al., 2010; Reavley et al., 2021).

Future Implications and Considerations for MHFA in Rural Settings

Implementation of MHFA in virtual or hybrid format offers an opportunity to build community capacity to address mental health needs in rural settings. We provide several suggestions and considerations for successful implementation based on the participants' feedback and our team's experience delivering the program virtually:

- Several participants mentioned that they found out about the trainings by word of mouth and wished that there were more visible notices provided about the offerings. Local community partners would be a great point of contact to spread the information about events being offered. Additionally, attending virtual community action meetings and other relevant virtual events, as well as making continued efforts to publicize about the events via social media and e-newsletters, were a central part of our program implementation.
- Facilitators can increase the buy-in from the participants by emphasizing that MHFA is a way to enhance the community's ability to support itself. Such an emphasis would align with rural communities' cultural emphasis on self-sufficiency - not having to depend on "outsiders" or urban areas for resources. This was evidenced in our participants' acknowledgment of having more community partnerships and improving their capacity to interact with a person experiencing a mental health challenge as a result of attending the trainings.
- Suggesting the program as mandatory staff training for capacity building is one approach that we have found to be well-received by organizations. Based on our experience, more employers are seeing the need for this type of professional development, and we can keep that momentum going through a series of training opportunities. When expanding partnerships, identifying potential key partners who would be committed to being trained as instructors and delivering the program locally would be a great asset.
- We also recognize that offering the training in multiple formats will become increasingly important. As COVID restrictions evolve, organizations may be transitioning back and forth between virtual and in-person operations. Moreover, not all instructors may feel comfortable delivering the training fully virtually, so capitalize on that by having them offer in-person or hybrid formats. Our participants' responses suggested that, despite the gradual lifting of the COVID restrictions, they appreciated having virtual options because of better accessibility. Particularly for the rural context, however, it is important to consider accessibility factors, including limited broadband access, digital literacy of the participants (e.g., familiarity with virtual interface), and device access.

- Consistent communication and marketing efforts need to be put into publicizing the events offered. A few participants mentioned they wanted more notifications about the events we are offering because they were only able to attend via word of mouth from co-workers or a personal connection with the educator.

Conclusion

Pre-existing mental health disparities among rural populations, coupled with the mental health impacts of COVID-19, call special attention to the mental health needs of rural residents in the U.S. Building community capacity through delivering evidence-based programs and training community members is one approach to addressing such health problems. The Maryland ROTA project was launched right before the COVID-19 pandemic hit the U.S., resulting in the need to adjust our implementation strategies to deliver evidence-based programs entirely virtually. MHFA was one of the programs offered by Maryland ROTA. In contrast, the effectiveness of the MHFA program is well-documented. Limited information is available on this new virtual delivery of MHFA. Our team had this opportunity to be at the forefront of implementing the program with a newly revised delivery option as we navigated the restrictions and uncertainties associated with the pandemic. The data included in this study replicate and expand upon the evidence for the effectiveness of virtual delivery found in other countries (Jorm et al., 2010; Reavley et al., 2021) in two notable ways. First, our data are based on the utilization of a newly updated version of the MHFA curriculum. Second, our data provide implementation outcomes from a time period of population-wide mental health challenges and needs.

Findings from our preliminary evaluation data illustrate the virtual program's positive impact on participants' knowledge, attitudes, and skills in addressing mental health problems. In addition, the program in virtual format was generally well-received by the participants. Findings suggest that the virtual format of MHFA can be effective and serve as an important resource to address rural mental health disparities by reaching rural populations beyond the pandemic. Despite the overall positive experience, several factors need to be considered for future research and practice efforts. We learned that building sustainable partnerships with local community organizations is foundational to a successful implementation. It is critical to communicate with partners to meet their specific local needs when offering these training opportunities. While we successfully adapted to the pressing need for entire virtual operations, we also recognize the importance of staying flexible as the uncertainties with COVID-19 circumstances persist; factors such as Zoom fatigue, limited broadband access and digital literacy of audiences, and gradual preference to return to in-person sessions, need consideration when strategizing for program implementation. Future research and practice efforts should account for such factors to effectively deliver interventions for mental health needs in rural settings.

References

- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77–101. <https://doi.org/10.1191/1478088706qp063oa>
- Cohen, L., & Swift, S. (1999). The spectrum of prevention: Developing a comprehensive approach to injury prevention. *Injury Prevention*, 5(3), 203–207. <https://doi.org/10.1136/ip.5.3.203>
- Czeisler, M. É., Lane, R. I., Petrosky, E., Wiley, J. F., Christensen, A., Njai, R., Weaver, M. D., Robbins, R., Facer-Childs, E. R., Barger, L. K., Czeisler, C. A., Howard, M. E., & Rajaratnam, S. M. W. (2020). Mental health, substance use, and suicidal ideation during the COVID-19 pandemic—United States, June 24–30, 2020. *Morbidity and Mortality Weekly Report*, 69(32), 1049–1057. <https://doi.org/10.15585/mmwr.mm6932a1>
- El-Amin, T., Anderson, B., Leider, J., Satorius, J., & Knudson, A. (2018). Enhancing mental health literacy in rural America: Growth of Mental Health First Aid program in rural communities in the United States from 2008–2016. *Journal of Rural Mental Health*, 42(1), 20–31. <https://doi.org/10.1037/rmh0000088>
- Hadlaczky, G., Hökby, S., Mkrtchian, A., Carli, V., & Wasserman, D. (2014). Mental Health First Aid is an effective public health intervention for improving knowledge, attitudes, and behavior. A meta-analysis. *International Review of Psychiatry*, 26(4), 467–475. <https://doi.org/10.3109/09540261.2014.924910>
- Holland, K. M., Jones, C., Vivolo-Kantor, A. M., Idaikkadar, N., Zwald, M., Hoots, B., Yard, E., D’Inverno, A., Swedo, E., Chen, M. S., Petrosky, E., Board, A., Martinez, P., Stone, D. M., Law, R., Coletta, M. A., Adjemian, J., Thomas, C., Puddy, R. W., ... Houry, D. (2021). Trends in U.S. emergency department visits for mental health, overdose, and violence outcomes before and during the COVID-19 pandemic. *JAMA Psychiatry*, 78(4), 372–379. <https://doi.org/10.1001/jamapsychiatry.2020.4402>
- Jensen, E. J., & Mendenhall, T. (2018). Call to action: Family therapy and rural mental health. *Contemporary Family Therapy*, 40, 309–317. <https://doi.org/10.1007/s10591-018-9460-3>
- Jorm, A. F., Kitchener, B. A., Fischer, J. A., & Cvetkovski, S. (2010). Mental Health First Aid training by e-learning: A randomized controlled trial. *Australian & New Zealand Journal of Psychiatry*, 44(12), 1072–1081. <https://doi.org/10.3109/00048674.2010.516426>
- Jorm, A. F., Kitchener, B. A., & Reavley, N. J. (2019). Mental Health First Aid training: Lessons learned from the global spread of a community education program. *World Psychiatry*, 18(2), 142–143. <https://doi.org/10.1002/wps.20621>
- Kitchener, B. A., & Jorm, A. F. (2006). Mental Health First Aid training: Review of evaluation studies. *Australian & New Zealand Journal of Psychiatry*, 40(1), 6–8. <https://doi.org/10.1080/j.1440-1614.2006.01735.x>
- McCormack, Z., Gilbert, J. L., Ott, C., & Plake, K. S. (2018). Mental Health First Aid training among pharmacy and other university students and its impact on stigma toward mental illness. *Currents in Pharmacy Teaching and Learning*, 10(10), 1342–1347. <https://doi.org/10.1016/j.cptl.2018.07.001>

- Monteith, L. L., Holliday, R., Brown, T. L., Brenner, L. A., & Mohatt, N. V. (2020). Preventing suicide in rural communities during the COVID-19 pandemic. *The Journal of Rural Health*, 37(1), 179–184. <https://doi.org/10.1111/jrh.12448>
- Morgan, A. J., Ross, A., & Reavley, N. J. (2018). Systematic review and meta-analysis of Mental Health First Aid training: Effects on knowledge, stigma, and helping behaviour. *PLOS ONE*, 13(5), e0197102. <https://doi.org/10.1371/journal.pone.0197102>
- Pettrone, K., & Curtin, S. C. (2020). *Urban-rural differences in suicide rates, by sex and three leading methods: United States, 2000–2018* (NCHS Data Brief no. 373; p. 8). National Center for Health Statistics.
- Reavley, N. J., Morgan, A. J., Fischer, J. A., Kitchener, B., Bovopoulos, N., & Jorm, A. F. (2018). Effectiveness of eLearning and blended modes of delivery of Mental Health First Aid training in the workplace: Randomised controlled trial. *BMC Psychiatry*, 18(1), 1–14. <https://doi.org/10.1186/s12888-018-1888-3>
- Reavley, N. J., Morgan, A. J., Fischer, J. A., Kitchener, B. A., Bovopoulos, N., & Jorm, A. F. (2021). Longer-term effectiveness of eLearning and blended delivery of Mental Health First Aid training in the workplace: 2-year follow-up of a randomised controlled trial. *Internet Interventions*, 25, 100434. <https://doi.org/10.1016/j.invent.2021.100434>
- Robertson, M. N., DeShong, H. L., Steen, J. S., Buys, D. R., & Nadorff, M. R. (2021). Mental Health First Aid training for Extension agents in rural communities. *Suicide and Life-Threatening Behavior*, 51(2), 301–307. <https://doi.org/10.1111/sltb.12705>
- Summers-Gabr, N. M. (2020). Rural-urban mental health disparities in the United States during COVID-19. *Psychological Trauma: Theory, Research, Practice, and Policy*, 12(S1), S222–S224. <https://doi.org/10.1037/tra0000871>
- Talbot, J. A., Ziller, E. C., & Szlosek, D. A. (2017). Mental Health First Aid in rural communities: Appropriateness and outcomes. *The Journal of Rural Health*, 33(1), 82–91. <https://doi.org/10.1111/jrh.12173>
- The Rural Maryland Council*. (2013, October 23). Rural Maryland Council. <https://rural.maryland.gov/the-rural-maryland-council/>
- Wilson, W., Bangs, A., & Hatting, T. (2015). *The future of rural behavioral health* [National Rural Health Association Policy Brief]. National Rural Health Association. https://www.ruralhealth.us/NRHA/media/Emerge_NRHA/Advocacy/Policy%20documents/The-Future-of-Rural-Behavioral-Health_Feb-2015.pdf

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Acknowledgments

We gratefully acknowledge the contribution of our study participants, educators who helped deliver the programs, and local community partners who connected us to various groups and supported our program implementation. Funding for this study was provided by the Substance Abuse and Mental Health Services Administration (SAMHSA; Grant no. H79TI082561) under the Rural Opioid Technical Assistance (ROTA) program.

Organizational Leader's Leadership Competencies Assessment Technique

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We developed a three-phase assessment technique to define Extension administrators' leadership competencies. The new three-phase leadership assessment technique can help maximize the individual's contributions, foster creative small group discussion, and share group vision. However, this tool could be applied to groups of 9-12. Our technique can be implemented within Extension and other organizations to determine future leadership skills needed among top organizational leaders.

Keywords: qualitative needs assessment technique, leader competencies, leadership competencies, leadership competencies assessment technique

Introduction

The article aims to introduce readers to the newly developed, three-phased leaders' competencies assessment technique. We believe this technique helps maximize individuals' contributions, foster dynamic small group discussion, and share small group vision with a larger group. This assessment can help identify leadership development needs among top organizational leaders.

Why Did We Develop the Assessment Technique?

A systematic process of needs assessment for health and human services and education has been used in the United States since 1960 (Witkin, 1984). Cooperative Extension organizations use different approaches to identify assets and needs and develop and deliver educational programs. The traditional approach to needs assessment methodology has been widely criticized since the 1970s (Alschuld, 2015; Altschuld & Kumar, 2010). Major concerns include the following: fully quantitative, costly, negative connotation of needs assessment, which does not inspire an uplifting environment, and voices of the target population are not included in the assessment. Cooperative Extension has investigated leadership development for both county Extension educators (Argabright et al., 2019; Benge et al., 2011; Benge & Sowcik, 2018; Lakai et al., 2014; Ricketts et al., 2012) and state specialists (Radhakrishna, 2001). However, a gap in the literature was identified related to professional development needs and assessments for Extension administrative positions. Leadership needs assessment of Extension administrators should be a concern for the modern Extension organization (K. Cason, personal communication, October

2018). Due to a lack of needs assessment research on the leadership competencies of top leaders in Extension, we developed a qualitative approach to help Extension administrators better understand the leader (intrapersonal) and leadership (interpersonal) competencies needs of developing future thriving Extension leaders. Day (2000) distinguished leader (intrapersonal) and leadership (interpersonal) development. The authors emphasized “a general need to link leader development, primarily based on enhancing human capital, with leadership development that emphasizes the creation of social capital in organizations” (p. 581). In 1999, Lepak and Snell indicated that organizations primarily invest in a leader’s training and development to enhance and protect their human capital and emphasize individual-based knowledge, skills, and abilities associated with formal leadership roles. Day (2000) described leadership development as “an integration strategy by helping people understand how to relate to others, coordinate their efforts, build commitments, and develop extended social networks by applying self-understanding to social and organizational imperatives” (p. 586). Day’s leader (intrapersonal) and leadership (interpersonal) development approach helped us to develop an assessment tool with both components.

A Three-phase Assessment Technique

Our qualitative assessment technique is a three-phase methodology. The technique capitalizes on an individual participant’s contribution in assessing leaders’ and leadership challenges and competencies needs. In the first phase, participants reflect on four questions at the individual level related to their leader and leadership development based on their experience. During the second phase, participants have small and large group discussions about the team leaders’ challenges. During the third phase, participants work in small groups, assessing organizational leaders’ competencies and skills needs; then, they discuss with large group participants. During the analysis phase, the facilitator independently evaluates participants’ responses and synthesizes them into common themes. This approach helps to connect each participant’s past leadership experiences, discuss the leadership team’s challenges, and identify the competencies and skills needed for Extension administrators in their state. The five leading experts in the Extension field reviewed developed questions to establish instrument face and content validity. The leaders’ competencies assessment technique steps are further described in Table 1. The facilitator should welcome the participants and introduce them to the format of the technique. The welcome should include the introduction, and the three phases of the session can be completed in 90 minutes. We also recommend using the technique with groups of nine to 12 participants. A facilitator guide and a participant worksheet are presented in Appendix A and Appendix B.

Table 1. Steps in Conducting the Leader (Intrapersonal) and Leadership (Interpersonal) Competencies Need Assessment

Step	Time allotted
Face-to-face session	
<i>Introduction</i>	
1. Review the facilitator guide (see Appendix B).	Before the session
2. Establish and provide a comfortable meeting environment.	
3. Describe the purpose of the session.	5 min
4. Introduce the audience to the technique and provide the participant worksheet (see below, Table 1).	
<i>Phase 1 – Reflect on experience with a leader (intrapersonal) and leadership (interpersonal) development.</i>	
Individual work: Give participants 4 minutes to address each question. Have them write their answers on the participant worksheet.	16 min (for four questions)
1. Looking back over your life, what experience are you most proud of as a leader?	
2. What was your most disappointing experience as a leader?	
3. List your top 5 leadership activities as an Extension program leader in a year.	
4. In what ways do you feel you could have improved in the category of personal growth as a leader?	
<i>Phase 2 – Assessing the team leader's challenge (interpersonal level)</i>	
Small group work: Give small groups 10 minutes to discuss each question. Have them write their response on their worksheets.	20 minutes (for two questions)
1. What leadership challenges have you faced being a team leader?	
2. What factors accounted for these challenges working in a team?	
Large group discussion: Give the large group 5 minutes to discuss each question related to the leader's challenge.	10 min (for two questions)
<i>Phase 3 – Leader's competencies need (interpersonal level)</i>	
Small group work: Give small groups 10 minutes to discuss each question. Have them write their response on their worksheets.	20 min (for two questions)
1. What are the most important skills/competencies that will help improve your leadership teamwork?	
2. What contributes to being a thriving Extension leader in the State (portrait of a thriving leader: skills, abilities, traits)?	
Give each small group 3 minutes to present the results of their discussion on "Competencies of a future thriving leader at [State] Extension" to the large group.	9 min (for three small groups)
Large group discussion: Give the large group 5 minutes to discuss each question related to the leaders' competencies and needs.	10 min
After session	
Analyze participants' responses and share the results.	

Leader's Competencies Assessment Technique: Benefits and Challenges of Using

In our experience, we found that the leaders' competencies assessment technique has the following benefits:

- It allows practitioners to distinguish between the leader (interpersonal) and leadership (interpersonal) competencies needs.
- It capitalizes on individuals' insights while also optimizing contributions by small and large groups.
- Identifying the positive qualities of a leader provided a more positive connotation and environment for the needs assessment.
- Our assessment tool is only effective when it is result-focused and provides evidence. This evidence can be used to determine which of the possible competencies are most effective and efficient for achieving the desired results.

We have found that implementing the technique has some challenges:

- Preparation is the key, and it is time-consuming.
- Richer data may have been gathered with a longer session.
- The lack of time to discuss how funds may be identified and used to address challenges weakened the strength of the assessment report.

References

- Altschuld, J. W. (2015). *Bridging the gap between asset/capacity building and needs assessment: concepts and practical applications*. SAGE Publications.
- Altschuld, J. W., & Kumar, D. D. (2010). *Needs assessment: An overview*. SAGE Publications.
- Argabright, K. J., Davis, G. A., Torppa, C. B., King, J., Scheer, S. D., & Stollar, M. K. (2019). Developing and supporting the future Extension professional. *Journal of Extension*, 57(4), Article 21. <https://doi.org/10.34068/joe.57.04.21>
- Benge, M., Harder, A., & Carter, H. (2011). Necessary pre-entry competencies as perceived by Florida Extension agents. *Journal of Extension*, 49(5), Article 3. <http://www.joe.org/joe/2011october/a2.php>
- Benge, M., & Sowcik, M. (2018). Online leadership short course for county Extension directors. *Journal of Extension*, 56(6), Article 20. <https://doi.org/10.34068/joe.56.06.20>
- Day, D. V. (2000). Leadership development: A review in context. *The Leadership Quarterly*, 11(4), 581–613. <https://www.sciencedirect.com/science/article/pii/S1048984300000618>
- Lakai, D., Jayarante, K. S. U., Moore, G. E., & Kistler, M. J. (2014). Identification of the current proficiency level of Extension competencies and the competencies needed for Extension agents to be successful in the 21st century. *Journal of Human Sciences and Extension*, 2(1), 71–89. <https://doi.org/10.54718/UUTF8010>

- Lepak, D. P., & Snell, S. A. (1999). The human resource architecture: Toward a theory of human capital allocation and development. *Academy of Management Review*, 24(1), 31–48.
<https://journals.aom.org/doi/abs/10.5465/AMR.1999.1580439>
- Radhakrishna, R. B. (2001). Professional development needs of state Extension specialists. *Journal of Extension*, 39(5). <https://archives.joe.org/joe/2001october/rb4.php>
- Ricketts, K. G., Carter, H. S., Place, N. T., & McCoy, T. (2012). A look inside: Self-leadership perceptions of Extension educators. *Journal of Extension*, 50(5), Article 3.
<https://tigerprints.clemson.edu/joe/vol50/iss5/3>
- Witkin, B. R. (1984). *Assessing needs in educational and social programs*. Jossey-Bass.

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Appendix A

Participant Worksheet

Phase 1:

Reflect on experience with the leader (intrapersonal) and leadership (interpersonal) development (total time 16 minutes).

Looking back over your life, what experience are you most proud of as a leader? Capture a few details here (1-2 examples). (4 min) (*Individual work*).

What was your most disappointing experience(s) as a leader? Record your thoughts in the space below. Provide 1-2 examples. (4 min) (*Individual work*).

List your Top-5 leadership activities as the Extension program leader in a year. Write your Top-5 leadership activities below. (4 min) (*Individual work*).

In what ways do you feel you could have improved in the personal growth category as a leader? Record your thoughts in the space below. (4 min) (*Individual work*).

Phase 2:

Team Leader's Challenge (total time 30 minutes).

Please think about challenges you have faced when working as a team leader. Please list the challenges below. (10 min) (*Working in small groups*).

What factors accounted for these challenges when working in a team? Please list them below. (10 min) (*Working in small groups*).

Large group discussion on team leader's challenge. (10 min)

Phase 3:

Identifying future leader's competencies need/creating a thriving leader's portrait (total time 39 minutes).

Please list several of the most important things and skills that will help improve your team leadership. Please list skills here: (10 min) (*Working in small groups*).

What contributes to being a thriving leader in Extension (i.e., a profile of a thriving leader: skills, abilities, traits)? Please write down at least 5. (10 min) (*Working in small groups*).

Note to the facilitator: If using this assessment technique with another organization, replace the word "Extension" with your organization's name.

Appendix B

Facilitator Guide

Materials needed: printed participant worksheets, pens for each participant, three large Post-it sticky note pads, and at least three jumbo markers

1. Establish and provide a comfortable meeting environment. Describe the purpose of the session, and explain the protocol for Phases 1, 2, and 3. Provide the participant worksheet. Answer any questions participants may have. Remind them that they will be able to refer to the instructions on the worksheet (see Table 2). (5 minutes)

2. Use a stopwatch to keep the session on time. This is important because of the number of tasks participants are working on completing. We included times here in the facilitator guide and Table 1 in the text.

3. Phase 1. Ask participants to work individually by reflecting on their personal experience with the leader and leadership development. (16 minutes)

4. Phase 2. Ask participants to work in small groups and discuss the leader's challenges. (30 minutes)

5. Phase 3. Ask participants to work in small groups to identify the leadership competencies of a future thriving leader at your organization. Tell each group to assign a scribe. Ask them to write their results on one of the Post-it notepads. After, have each group place their Post-it on a wall in the room. Tell each group to assign a presenter to read their results to the group. Then, lead a large group discussion on outcomes. (39 minutes)

Note: Only one facilitator is needed to facilitate the leadership assessment.

Enhancing Production Efficiency and Farm Profitability Through Innovative Extension Programming

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Cooperative Extension strives to provide agricultural producers with non-formal educational opportunities designed to positively impact agriculture (NIFA, 2021). Therefore, a team of Extension professionals at the University of Nebraska – Lincoln developed and facilitate an ongoing professional development program designed to enhance the engagement of agricultural producers in farm management, especially in the areas of input use efficiency and profitability. Andragogy was used as the framework to help ensure the Testing Agricultural Performance Solutions (TAPS) program provided agricultural producers with non-formal education that aligned with andragogical principles. Knowles (1980) refers to andragogy as the “art and science of helping adults learn” (p. 45) and his assumptions of andragogy include: 1) Learner’s need to know, 2) Self-Concept of the learner, 3) Prior experience of the learner, 4) Readiness to learn, 5) Orientation to learning, and 6) Motivation to learn (Knowles, 1998, as cited in Knowles et al., 2015, p. 6). The TAPS program uses the assumptions of andragogy (Knowles, 1998, as cited in Knowles et al., 2015) to provide a common platform for experiential and peer-to-peer learning that includes the involvement of university researchers, extension specialists, and industry personnel.

Keywords: andragogy, Extension, experiential learning

Cooperative Extension strives to provide agricultural producers with non-formal educational opportunities designed to positively impact agriculture (National Institute of Food and Agriculture, 2021). Therefore, a team of Extension professionals at the University of Nebraska-Lincoln developed and facilitated an ongoing professional development program designed to enhance the engagement of agricultural producers in farm management, especially in the areas of input use efficiency and profitability. Andragogy was used as the framework to help ensure the Testing Agricultural Performance Solutions (TAPS) program provided agricultural producers with non-formal education aligned with andragogical principles. Knowles (1980) refers to andragogy as the “art and science of helping adults learn” (p. 45), and his assumptions of andragogy include (a) learner’s need to know, (b) self-concept of the learner, (c) prior experience of the learner, (d) readiness to learn, (e) orientation to learning, and (f) motivation to learn

(Knowles, 1998, as cited in Knowles et al., 2015, p. 6). The TAPS program uses the assumptions of andragogy (Knowles, 1998, as cited in Knowles et al., 2015) to provide a common platform for experiential and peer-to-peer learning that includes the involvement of university researchers, Extension specialists, and industry personnel.

TAPS consists of a series of annual farm management competitions coupled with educational and social events, which connect producers to new and developing technologies, tools, methods, peer support and recognition, and other resources, all without exposure to actual production or financial risk(s) (Burr et al., 2020). TAPS focuses on three critical outcomes, which are incentivized by decreasing cash prizes in the following order: (a) most profitable farm, (b) most water and nutrient-efficient farm, and (c) highest-yielding farm. The TAPS competitions provide producers the space and environment to evaluate and benchmark multiple input and management choices, including crop insurance selection, hybrid selection and planting density, marketing strategy, irrigation scheduling and quantity, fertilizing method, timing, and amount.

There are four foundational components and one general philosophy behind the TAPS program. The four foundational components include (a) competition, (b) experiential learning, (c) peer-to-peer opportunities, and (d) social interaction. They align with the six assumptions of andragogy (Knowles, 2015). TAPS is centered around participant interaction, educational opportunities, and relationship-building and provides an atmosphere that drives competition. The physical components, such as the contest farm site, provide experimental and experiential workspace; measurement of input and output differences; facilitation of communication reference points; and ensures reliability, realism, detail, and consistency, which help to enhance the quality of the TAPS program.

References

- Burr, C. A., Rudnick, D. R., Stockton, M. C., Tigner, R., & Rhoades, K. (2020). Engaging farmers and the agriculture industry through the testing agricultural performance solutions program. *Journal of Extension*, 58(5), Article v58-5a3.
<https://archives.joe.org/joe/2020october/a3.php>.
- Knowles, M. S. (1980). *The modern practice of adult education: From pedagogy to andragogy*. Cambridge Adult Education.
- Knowles, M. S., Holton, E. F., III, & Swanson, R. A. (2015). *The adult learner: The definitive classic in adult education and human resource development*. Routledge.
- National Institute of Food and Agriculture [NIFA]. (2021, Sep. 15). *Extension*.
<https://nifa.usda.gov/extension>

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ISSN

ISSN 2325-5226

Publication Agreement

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