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Research Article

Growing Seeds, Minds, and Community: A Case Study Evaluation of the Green Thumb Project's Youth Internship Program

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ABSTRACT

Urban community gardens are often home to a variety of environmental education programs. One such program centered in a community garden is the Youth Internship Program created by The Green Thumb Project. Through mixed methods techniques and a case study approach, the Youth Internship Program's immediate outcomes were evaluated by assessing 12 participants' changes in career preparedness skills, healthy living attitudes, and content knowledge after participating in the eight-week long curriculum. Outcomes were assessed through the lens of situated learning theory and its relation to place-based environmental education. Through analysis of the quantitative and qualitative data, results indicated that the Youth Internship Program was effective in positively changing all interns' skills, attitudes, and knowledge. Linear regressions showed that skills, attitudes, and knowledge had significant positive relationships with one another. This finding indicated that the themes were interconnected and that learning gains in one area helped interns experience gains in another area. Overall, the data demonstrated that the program was effective in helping interns grow personally, professionally, and academically.

Keywords: career preparedness skills, healthy living attitudes, content knowledge, situated learning theory, environmental education

INTRODUCTION

Urban agriculture has been a site in which the intersection of environmental health, personal-wellbeing, and food justice has flourished (Alaimo et al., 2016; Horst et al., 2017). The original purpose of urban agriculture in the United States was to combat the urbanization, economic instability, and environmental degradation of the times (Draper & Freedman, 2010).

Urban agriculture is defined as a location where food cultivation occurs in an urban environment (Hung, 2004). Although goals of urban agricultural spaces may vary, those utilized at the community level often aim to lessen food insecurity in regions characterized by low access to fresh and nutritious foods and promote physical health through the use of community gardens.

Community gardens have personal and community wide impacts that lead to increased health and improved sense of self (Alaimo et al., 2016; Horst et al., 2017; Hung, 2004). Many community garden programs are often centered around experiential learning models with emphasis on food accessibility, healthy eating, and social inclusion (Gibbs et al., 2013). The establishment of community gardens has been shown to have a variety of positive effects on students.

Educational gardens develop career skills, teach healthy lifestyle habits, promote environmental stewardship, demonstrate sustainable food production, address the problem of food deserts, and engage students in the social process of learning (Broaddus et al., 2015; Dutta & Chandrasekharan, 2017; Hung, 2004).

These concepts are defined as career preparedness skills (CPS), healthy living attitudes (HLA), and content knowledge (CK) through learning in a community setting. Career preparedness includes development of workplace, business, and entrepreneurship skills. Healthy living encompasses experiencing positive attitudes toward nutrition and general health and wellness. CK includes the understanding of food systems and developing environmental literacy and pro-environmental civic behaviors. The purpose of this study is to determine the impact of an eight-week long community garden program for urban youth in changing participants' CPS, HLA, and CK.

LITERATURE REVIEW

Community Gardens' Effects on Career Preparedness Skills

Community gardens have been found to be a path for positive leadership skill development in youth. Schusler and Krasny (2010) found a strong link between community garden participation and leadership growth in youth. Schusler and Krasny (2010) demonstrated that youth were able to grow their leadership skills when program facilitators could create safe spaces, provide structure, build respectful and trusting relationships, bridge personal differences, set clear and rigorous expectations, and provide opportunities for meaningful contribution (Schusler & Krasny, 2010). Some urban community garden-based programs are designed to be internships, where participants are paid for their work while also experiencing formal and/or informal education (Hung, 2004). An increase in the availability of leadership development resources and paid internships could strengthen the already known positive effects gardening has on leadership skills.

Community Gardens' Effect on Healthy Living Attitudes

There are many benefits associated with all types of community gardens that are observable at the individual level related to changes in HLA. For example, community gardens can enhance physical and mental health (Alaimo et al., 2016; Diaz et al., 2018). People who participate in community gardens are exposed to new fruits and vegetables which expands their produce variety and increases produce consumption, as consistent exposure to produce can help overcome any dislike for fruits and vegetables (Alaimo et al., 2016). Produce consumption is linked to a variety of health benefits such as obtaining necessary nutrients, improved digestive health, and decreased risk of obesity and disease (Hambright-Belue & Holland, 2016; Horst et al., 2017). Gardening is also a form of physical exercise, which helps people live more active lifestyles. Activities such as weeding, watering, fertilizing, digging, and raking engage the lower and upper body and help people meet the daily recommendation of 30 minutes of moderate-intensity physical activity (Alaimo et al., 2016). Furthermore, participating in community gardens provides a space for individuals to work on mental health goals in a non "illness or deficit oriented" space (Alaimo et al., 2016, p. 306). Also, garden participants experience an increased sense of self and feelings of self-improvement. Community gardening allows individuals to demonstrate internal processes of self-efficacy and self-empowerment due to seeing how hard work produces tangible results (Alaimo et al., 2016; Dutta & Chandrasekharan, 2017). Community gardens have personal and community wide impacts that lead to increased HLA.

Community Gardens' Effect on Content Knowledge

Community gardens can also contribute to citizenship through gaining CK about the natural environment and learning skills in cultivating food (Bradley et al., 1999; Broaddus et al., 2015; Delia & Krasny, 2018; Dutta & Chandrasekharan, 2017; Horst et al., 2017; Madrigal et al., 2020). Numerous studies have shown the positive effects gardens have on connecting students to the land and helping students understand the importance of food systems and pro environmental attitudes. For example, a study done by Kulnieks et al. (2016) showed how K-12 students did not understand the connection between land and food. The production site of food was a foreign concept to many students who had no previous experience with farming or cultivating food. Connecting students to the land increased their appreciation for care of the environment and improved their CK about the importance of food systems and the role sustainable agriculture played in food security. In studies focused on the outcome of environmental awareness in community gardening, results have been linked to improved CK, academic performance, communication skills, self-worth, social commitment and responsibility, social skills, and positive relationships (Delia & Krasny, 2018; Hung, 2004).

Influences of increased CK from community gardens were also seen on the larger community level, not only at the individual level. Participating in community gardens allowed community members to gain CK in environmental science, food systems, and environmental civic responsibilities (Bradley et al. 1999; Diaz et al., 2018; Horst et al., 2017). Furthermore, gardens that were built and maintained by community members often provided extra benefits of community development by allowing members to feel a sense of control and create meaning and awareness of the place. Placemaking has been defined as "the intentional process by which youth and adults seek to transform their neighborhoods" (Hung, 2004). Murphy et al. (2019) demonstrated that when individuals spent time in a place and learned to care for it, they began to understand the social-ecological implications of the place and increased their environmental stewardship behaviors due to an increase in their CK of the gardens.

Situated Learning Theory

Situated learning theory (SLT) builds upon the theoretical concepts of sociocultural theory and constructivist theory, and posits that learning is a social process (Dentzau, 2021; French, 2020) and a student's prior knowledge acts as the foundation for new knowledge (Su, 2022). SLT focuses on the "novice learner," who is not defined as someone who lacks skill, but instead is viewed as a newcomer within a specific community of practice (Lave & Wenger, 1991; Matusov et al., 1994). Through community interactions and collaboration, a novice learner moves from the periphery of a community to the center of community practice, where community beliefs, behavior, and culture are at its core (French, 2020; Matusov et al., 1994; Lave & Wenger, 1991). Situated learning occurring in the periphery allows for self-evaluation, which leads to a deeper sense of personal value within the community (Matusov et al., 1994). Learning does not happen immediately, as the novice learner will go through many cycles of trial and error to develop new skills and knowledge (French, 2020). The learner begins to adopt, adapt, and change attitudes and viewpoints based on knowledge and experience gained within the community of practice (Matusov et al., 1994).

SLT has been utilized as the theoretical framework in the study of several community garden urban youth programs. Dutta and Chandrasekharan (2017) have shown how the SLT

framework, applied in a community garden setting, transformed participants' attitudes. Dutta and Chandrasekharan (2017) examined how situated learning led to development of values and attitudes in the garden setting. They found that the farming experience caused changes in cognition as the result of participating in communities of practice which contributed to a positive change in values and attitudes about the environment. Dutta and Chandrasekharan (2017) also found that to be effective in changing individual attitudes, environmental education needed to go beyond the information-based model and include place-based education suitable for developing communities of practice.

Place-Based Environmental Education

Community gardens represent a context for place-based environmental education (PBEE) programs. PBEE is learner-centered and connects local to global context by implementing inquiry-based strategies, systems thinking, and using the community as a classroom (Cruz et al., 2018; Dutta & Chandrasekharan, 2017; Powers, 2004). Place-based and environmental education has been shown to be an effective educational tool that can lead to attitude, knowledge, skill, and behavior changes in students (McInerney et al., 2011; Powers, 2004). There are many opportunities during PBEE for the novice student to learn in a community of practice by engaging in hands on experiences, interacting with community members, and making learning and knowledge relevant to local environmental and social problems (McInerney et al., 2011; Powers, 2004), which are also core concepts of SLT. The authentic context of a community garden is fertile ground for SLT practices and PBEE.

There are few studies on educational agriculture program outcomes specifically for urban high school youth (e.g., Nolan et al., 2022; Su, 2022). The existing literature focuses heavily on elementary students, middle school students, and adults. High school youth have been largely overlooked when studying the outcomes of urban agricultural programs. Some non-profit organizations attempted to fill this need by providing youth with community garden experiences both inside and outside of the school setting. This research attempts to fill the gap in the literature by measuring a community garden program's ability to change urban highschoolers' skills, attitudes, and knowledge, related to the program's three pillars of career preparedness, healthy living, and content knowledge.

A desire to understand if a community garden has met its intended program goals led to the following research questions:

1. How effective is an urban agricultural farming internship program using a community garden in changing high school participants' CPS, HLA, and CK?
2. What is the relationship among the program's goals of CPS, HLA, and CK?

The present study was part of a larger research project on the effects of a community garden on high school interns. This study will present the results related to all interns' transformations in skills, attitudes, and knowledge.

METHODOLOGY

This study used a mixed methods research approach where quantitative and qualitative data were collected to answer the research questions and provide for a more comprehensive case study evaluation (Creswell, 2009). The research design arose from a social constructivist worldview, wherein the goal was to rely on the participants' view of the situation being studied with the researchers interpreting the meaning (Creswell, 2009).

SLT guided the development of a pre- and post-survey, post interviews, participant observation, and content analysis of journal responses, which were used sequentially and concurrently. Due to time limitations, only immediate outcomes of the internship program were evaluated. Immediate outcomes were those that could be measured directly following the completion of the program and could be considered changes in knowledge, attitudes, skills, and aspirations (Diaz et al., 2018).

Context

The study was conducted in an urban city in the southeast United States. The zip code in which the study occurred has a population of about 20,800 people. The demographics consist of 53% female, 47% male, 53.3% Black or African American, and 43.4% Caucasian (United States Zip Codes, 2021). Over 4,000 households have an annual income of less than $25,000, and 21.1% of families in the zip code live at or below the poverty line (United States Zip Codes, 2021).

The geographical area for this study is considered a food desert because it is characterized by low access to fresh and nutritious foods (United States Department of Agriculture, 2020). In the future, it is anticipated that problems related to being a food desert will be exacerbated due to the city growth rate being three times the national average causing the demand for food to increase while the supply remains limited (City Regional Development Alliance, 2018).

The Green Thumb Project

The Green Thumb Project (GTP) is a 501c3 non-profit organization located in the demographic zip code addressed above and begun with the initial intent to fill the need for food security through community gardening. The GTP builds urban gardens, hosts garden programs with well-developed grade level curricula in line with state expectations and provides a variety of other community garden-based environmental education (EE) programs in the area. The GTP looks to educate participants about sustainability of healthy and local foods while fostering lasting relationships, building community and character, and increasing pro-environmental attitudes.

The Youth Internship Program

The Youth Internship Program (YIP) is an eight-week paid employment opportunity for high school students. The GTP YIP's mission is to empower young people to become active leaders who are connected to the land and their community by cultivating literacy in three pillars: Career preparedness, healthy living, and content knowledge.

Career preparedness

Career preparedness was defined by GTP as workplace, leadership, business, and entrepreneurial skills. Participants were trained in workplace and leadership skills through faculty teaching problem-solving techniques and critical thinking which were applied to work-based problems, conflict resolution, accepting constructive feedback, active listening, life planning, and goal setting methods based within the community garden.

Healthy living

The healthy living pillar was defined as cooking, nutrition, health, and wellness. The YIP taught participants about cooking and nutrition through lessons that assisted interns in building healthy relationships and positive attitudes with their food grown in the community garden. Such lessons helped interns learn the components of a balanced meal and advance self-efficacy skills to advocate for and prepare healthy meals.

Content knowledge

The pillar of CK was defined as knowledge about food pollution and waste, farm management practices, science of gardening, and sustainable agriculture. For example, participants learned about food transport, sources of pollution through food systems, the food environment and how a healthy environment promotes healthier choices, the problem of food waste and possible solutions, and the effects of pesticides. Interns gained experience in field work through direct engagement with GTP's urban community garden while being educated about the components of farming, styles of farming, role of farming in food systems, and relationship between the local land and community to enhance participants' capacity to be active stewards of the Earth.

Participants

12 high-school aged interns participated in the study and attended high schools in the greater metropolitan area. Data was collected from all interns (n=12). Four of the interns were 15 years old and eight of the interns were 17 years old at the start of the program. One participant just completed 9th grade, three participants just completed 10th grade, and eight participants just completed 11th grade. Seven interns identified as Black or African American, three interns identified as White or Caucasian, one intern identified as Asian, Asian Pacific Islander, or Pacific Islander, and one intern identified as Middle Eastern. Six interns identified as female, and six interns identified as male. Interns lived in seven zip codes in the county area, and all attended a high school located in the greater metropolitan area. Two interns reported receiving government assistance in the form of Supplemental Nutrition Assistance Program, Electronic Benefit Transfer, or Temporary Assistance for Needy Families and three interns reported qualifying for or receiving free or reduced-price lunch at school.

Data Sources

Survey design and instrument

A survey was developed that consisted of five sections which included questions and statements about participant demographics and program pillars. The first section of the survey focused on demographics. The remaining four sections consisted of a total of 48 statements, which were 5-point Likert-scale items written in the affirmative format. The statements were developed to ascertain if the participants perceived that they were developing CPS, HLA, and CK. For example, a statement for CPS was, "I am able to think critically to solve problems." A statement for HLA was, "I believe the foods I eat affect my body." A statement for CK was, "I can define biodiversity." Participants were to rank their answer on a Likert scale from *strongly disagree* to *strongly agree*. The survey was administered before the start of the program and at the end of the eight-weeks. The survey has construct validity based on experts' opinions in the field who reviewed all survey statements. Four experts in the fields of education, science education, and public health reviewed the survey statements and found that the statements were consistent with SLT and the measurable intended outcomes and purpose of the GTP.

Interview design and protocol

Semi-structured interviews were conducted at the end of the eight-week internship (Berg, 1995). The interview questions built on the survey statements to gain more in-depth information about the YIP pillars. There was a total of nine essential questions to cover the topics of CPS, HLA, and CK. All interviews occurred during the last week of the program, with two-three participants being interviewed per day. One intern was interviewed over Zoom after the program, due to illness. The duration of each interview was approximately 30-75 minutes. All interviews were recorded with participant permission and later transcribed.

Participant observation

While interns went through the 8-week internship program, the researcher conducted participant observations (Laurier, 2009). The researcher was focused on participants' actions and behaviors by monitoring the development of skills, attitudes, and knowledge over the course of the program. The researcher kept a behavior log where field notes relating to the purpose of the study were recorded. *A priori* themes were originally used to guide the participant observations; however, participant observations were not limited by the *a priori* themes which allowed emergent themes to be developed. During the eight-week program the researcher was heavily involved in delivering educational lessons, participating in urban farm workdays, traveling on field trips, and managing the farm stand. Through engagement with the interns during participant observations, the researcher got to know each individual on a personal level, which helped the researcher interpret the meaning behind observed actions, interactions, and verbal expressions.

Journaling

Participants wrote weekly journal responses to prompts that were predetermined by GTP staff in conjunction with the researcher. Eight weekly journal prompts aligned with the word of the week and content from educational sessions. However, not all interns submitted journal entries every week due to vacations, sickness, and other unforeseen circumstances. Participants had the option to take multiple approaches to journaling such as, using bullet points, sensory descriptions, and poems.

Table 1. Chi-square results

Survey section	All interns pre-survey mean score (n=12)	All interns post-survey mean score (n=12)	X^2 value	p-value
Career preparedness skills	3.7	4.4	62.86	7.26E-3*
Healthy living attitudes	3.6	4.3	65.44	2.08E-13*
Content knowledge	2.8	4.3	318.36	1.18E-67*

Note. Results of the Chi-square conformity tests by Likert-scale survey section for all interns (n=12) & *p<.05

Data Analysis

Quantitative data collected from the pre- and postsurveys were analyzed in Microsoft Excel using descriptive statistics and a chi-squared test, while regression tests were done in the statistical program R. A regression test was needed to answer research question 2 to assess the strengths of the relationships between the themes. Survey responses were evaluated by themes and sub-themes, comparing mean responses between and across all themes for the pre- and postsurvey. To determine if changes in mean responses were statistically significant, chi-square conformity tests were done. Then, to evaluate the relationships between *a priori* themes, simple linear regressions were completed. *Z*-tests were used to further examine relationships observed in the linear regression results. Slopes from regression results based on the presurvey were compared to the slopes from the postsurvey data to determine programmatic effects. The sample size for data analysis for all interns met Cochran's rule of 5, making a Chi-square and regression test statistically appropriate (Morgan, 2017).

Qualitative data from this study included transcribed interviews, participant observations, and journal responses. Qualitative data transcripts were analyzed using the program NVivo. All qualitative data was coded in NVivo using open coding techniques (Cope, 2009). In NVivo, analytic and thematic codes were produced. The in vivo descriptive codes and the analytic, emergent codes were connected back to the theoretical framework of SLT and its relation to PBEE (Cope, 2009). The major *a priori* themes of CPS, HLA, and CK, and their subsequent sub-themes, were defined from existing literature and the stated YIP purpose and pillars. Additional emergent themes were developed from the data that were central to the theoretical framework and literature review. All data, quantitative and qualitative, were triangulated to confirm that the data obtained from multiple sources was viable and showed similar results. Triangulation ensured reliability and validity of the results (Cope, 2009).

RESULTS

To answer the research questions, the results for the study were separated by type of data (quantitative and qualitative). The quantitative results were organized by the *a priori* themes of CPS, HLA, and CK. Qualitative data were also organized by *a priori* themes. Qualitative data was used to support quantitative findings and further answer research questions.

Quantitative Data

Surveys

CPS are the ability to do something well or complete a task in the workplace environment. Such skills were further defined by the *a priori* sub-themes of problem solving, life planning/goal setting, conflict resolution, constructive feedback, and active listening. The mean score for this section of the presurvey (**Table 1**) was overall positive as it most closely related to "somewhat agree" (M=3.7), which was expected as all inters are familiar with these skills due to holding previous jobs and being involved in school environments. All interns had a higher mean score for CPS in the postsurvey than in the presurvey. This was anticipated as it was expected for interns to strengthen these skills due to the YIP. All interns had a postsurvey mean score of 4.4 which is most closely related to the statement of "somewhat agree." Through analysis of sub-themes, it appeared that all interns felt confident in their active listening, problem solving, and conflict resolution skills. However, not all interns felt confident in their life planning/goal setting and constructive feedback skills for both the pre- and postsurveys.

HLA are defined by thoughts or feelings related to health and wellness that may be reflected in one's behavior. Such attitudes are further defined by the *a priori* sub-themes of relationship between food and mood, mindfulness/balance, and self-efficacy. The presurvey results for HLA were expected. The mean score for this section of the presurvey for all interns (**Table 1**) was overall positive as it most closely related to "somewhat agree" (M=3.6). For all interns, the mean score (**Table 1**) for this section of the postsurvey closely related to "somewhat agree" (M=4.3). Through analysis of presurvey sub-themes, it appeared that all interns had mixed attitudes toward self-efficacy and mindfulness/balance. Statements relating to these sub-themes received positive responses in the postsurvey. The relationship between food and mood was not notable in the presurvey, but interns expressed strong positive attitudes toward this sub-theme in the postsurvey.

CK was defined as understanding, comprehending, and/or mastery of facts and information about sustainable agriculture. Such CK was further defined by the *a priori* sub-themes of farm management practices, food pollution and waste, science of gardening, and farming. All interns did not feel confident in their CK before the YIP as the mean score (**Table 1**) for the survey section was situated just below "neither agree nor disagree" (M=2.8). This section of the presurvey received the lowest mean score which was expected. CK was a brand-new concept for most interns in the program as it focused on sustainable agriculture, which most interns do not learn about or practice in their daily lives. Most local high school core curricula do not include sustainable agriculture; therefore, many interns do not engage regularly with the concept of farming. The mean score for this section of the postsurvey was much higher than the presurvey score and closely related to "somewhat agree" (M=4.3). Through analysis of postsurvey sub-themes, all interns felt confident in their knowledge about food pollution and waste and science of gardening. These sub-themes were the focus of many

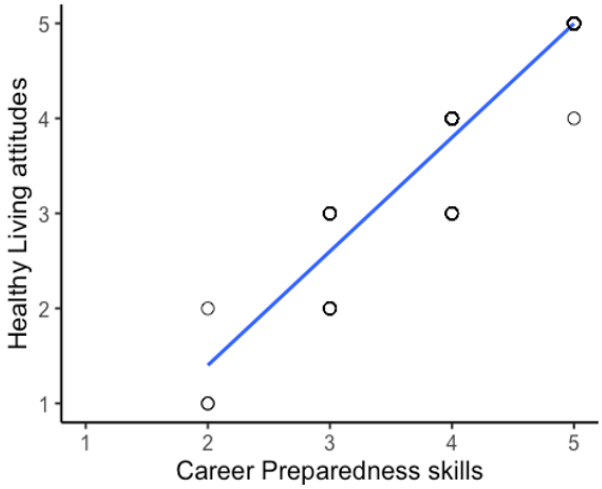

Figure 1. Effects of career preparedness skills on healthy living attitudes (for all interns on post-survey results. Slope=1.20)

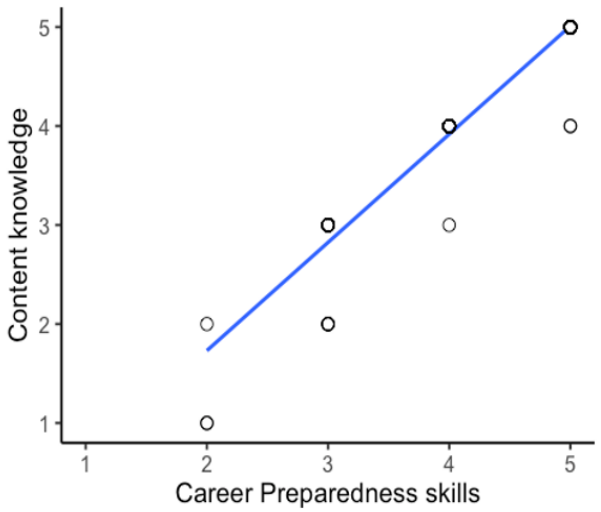

Figure 2. Effects of career preparedness skills on content knowledge (for all interns on postsurvey results. Slope=1.09)

educational lessons and field trips; therefore, it was expected that interns would gain the most knowledge in these areas. However, one aspect of science of gardening that a few interns were the least confident about was knowledge regarding plant lifecycles. This might be because there were no direct educational lessons about plant lifecycles.

Program effectiveness

The postsurvey mean scores (**Table 1**) for all themes increased compared to presurvey results due program intervention. In order to determine the effectiveness of the YIP on participants' CPS, HLA, and CK, survey means for each item in each *a priori* theme was determined. **Table 1** shows the means for the pre- and post-survey responses for each *a priori* theme and the Chi-square value to determine if the change in mean was significant. A chi-square conformity test was used to help answer research question 1. The following results were expected, as it was anticipated that SLT in the context of the YIP would significantly increase participants' skills, attitudes, and knowledge. SLT states that what people learn is situated in their role in a community. Gains in skills, attitudes, and knowledge were significant because the YIP occurred in a place-based setting allowing interns to actively engage in community practices.

There was a significant difference between pre- and post-responses for every Likert-scale section of the survey at the .05 level of significance. The CPS section mean scores increased from 3.7 to 4.4 after completion of the program. The Chi-square test results showed a significant increase in CPS, X^2(4, n=12)=62.86, p=7.26E-13 (**Table 1**). Similarly, for HLA, the pre mean score was 3.6, which increased to 4.3 after the YIP. All interns experienced a statistically significant increase in HLA, X^2(4, n=12)=5.44, p=2.08E-13 (**Table 1**). When looking at CK, all interns' presurvey mean score was 2.8, which increased to 4.3 in the post-survey. Interns experienced a significant increase in CK due to the YIP, X^2(4, n=12)=318.36, p=1.18E-67 (**Table 1**). When looking at the survey results, interns had the greatest gains in the CK section. Therefore, it was expected that CK would have the most significant p-value.

Relationship between themes

The next step of quantitative data analysis was to complete several regression analyses in R Studio to look at the relationship between *a priori* themes. This was done to answer research question 2. Each theme (CPS, HLA, and CK) was plotted against each other to determine how one variable affected the other. Within each of the following sub sections, results are reported by examining the relationship between themes based on postsurvey results because the relationship between themes after program completion was of most interest for this research project. Relationships between themes were examined by focusing on the regression slope and statistical significance.

Effects of career preparedness skills on other variables: The effects of CPS on HLA, and CK were examined for all interns (n=12) using postsurvey results. First, simple linear regression was used to test if CPS significantly predicted HLA. The fitted regression model was lm(HLA~CPS). The overall regression was statistically significant at the .05 level (R^2=0.90, F(1, 190)=1,626, p=<2.2E-16). It was found that CPS significantly predicted HLA (β=1.20, p≤2.2E-16). Next, simple linear regression was used to test if CPS significantly predicted CK. The fitted regression model was lm(CK~CPS). The overall regression was statistically significant at the .05 level (R^2=0.94, F(1, 190)=2,984, p=<2.2E-16). It was found that CPS significantly predicted CK (β=1.09, p≤2.2E-16). Meaning, as CPS increased so did CK. The presurvey results slopes for lm(HLA~CPS) and lm(CK~CPS) were both 0.98.

Figure 1 and **Figure 2** show a positive relationship between the effect of CPS on HLA and CK, with slopes of 1.20 and 1.09, respectively. The x- and y-axis values represent the Likert scale mean values for each theme between 1-5. The increase in slope values indicates that the effects of CPS on HLA and CK strengthened due to the YIP.

Effects of healthy living attitudes on other variables: The effects of HLA on CPS (**Figure 3**) and CK (**Figure 4**) were examined for all interns (n=12) using postsurvey results. The fitted regression model for the effects of HLA on CPS was lm(CPS~HLA). The overall regression was statistically significant at the .05 level (R^2=0.90, F(1, 190)=1,626, p≤2.2E-

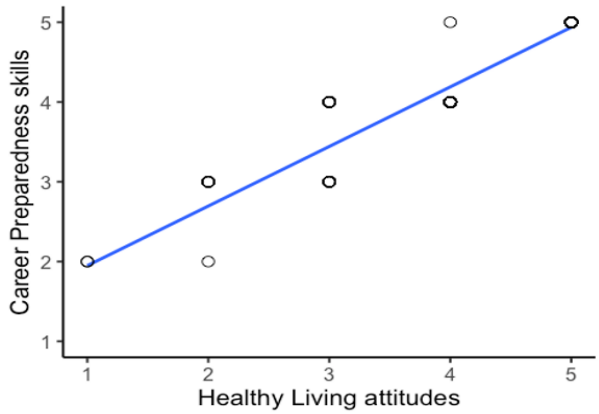

Figure 3. Effects of healthy living attitudes on CPS (for all interns on post-survey results. Slope=0.75)

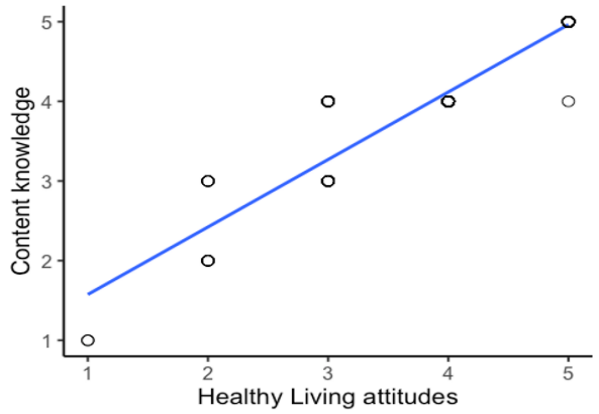

Figure 4. Effects of HLA on content knowledge skills (for all interns on post-survey results. Slope=0.85)

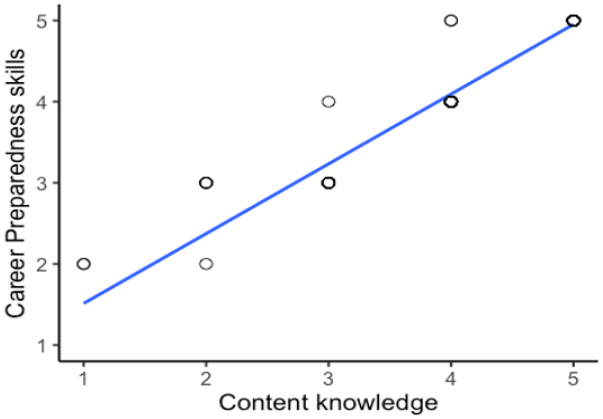

Figure 5. Effects of content knowledge on career preparedness skills (for all interns based on post-survey results. Slope=0.86)

16). It was found that HLA significantly predicted CPS (β=0.75, p≤2.2E-16). This means that as HLA increased so did CPS. Then, simple linear regression was used to test if HLA significantly predicted CK. The fitted regression model was lm(CK~HLA). The overall regression was statistically significant at the .05 level (R^2=0.91, F(1, 190)=1,841, p≤2.2E-16). It was found that HLA significantly predicted CK (β=0.85, p≤2.2E-16), meaning that as HLA increased so did CK. The presurvey results slopes for lm(CPS~HLA) and lm(CK~HLA) were both 0.98.

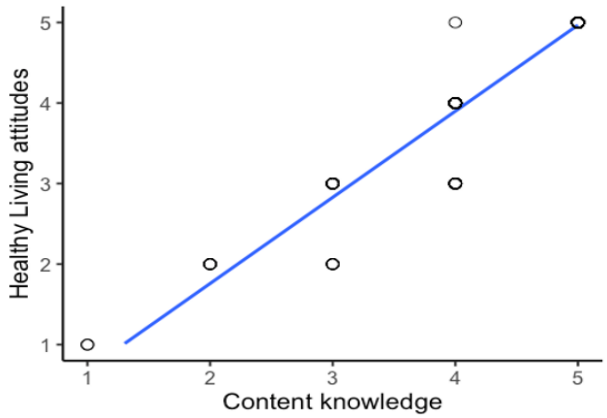

Figure 6. Effects of content knowledge on healthy living attitudes (for all interns on post-survey results. Slope=1.07)

Figure 3 and **Figure 4** show a positive relationship between the effect of HLA on CPS and CK, with slopes of 0.75 and 0.85, respectively. The x- and y-axis values represent the Likert scale mean values for each theme between 1-5. The slopes describing the effect of HLA on CPS and CK decreased from the beginning to end of the program. Due to the decrease in slope seen in the postsurvey simple linear regression results, it can be assumed that the effects of HLA on CPS and CK were not strengthened due to the YIP. This finding was unexpected. However, the results were still statistically significant indicating that there is still a strong positive relationship between themes.

Effects of content knowledge on other variables: Next, the effects of CK on CPS (**Figure 5**) and HLA (**Figure 6**) were examined for all interns (n=12) using postsurvey results. Simple linear regression was used to test if CK significantly predicted CPS. The fitted regression model was lm(CPS~CK).

The overall regression was statistically significant at the .05 level (R^2=0.94, F(1, 190)=2,984, p≤2.2E-16). It was found that CK significantly predicted CPS (β=0.86, p≤2.2E-16). Next, simple linear regression was used to test if CK significantly predicted HLA. The fitted regression model was lm(HLA~CK). The overall regression was statistically significant at the .05 level (R^2=0.91, F(1, 190)=1,841, p≤2.2E-16). It was found that CK significantly predicted HLA (β=1.07, p≤2.2E-16). The presurvey results slopes for lm(CPS~CK) and lm(HLA~CK) were both 0.80.

Figure 5 and **Figure 6** show a positive relationship between the postsurvey effect CK on HLA and CPS, with slopes of 0.86 and 1.07, respectively. The x- and y-axis values represent the Likert scale mean values for each theme between 1-5. Due to the increase in slope seen in the postsurvey simple linear regression results, it can be assumed that the effects of CK on HLA and CPS were strengthened due to the YIP.

Qualitative Data

All *a priori* themes and sub-themes were found in the qualitative data, which came from interviews, participant observations, and journal responses. The following paragraphs explore each of the *a priori* and emergent themes in more depth and help answer research questions 1 and 2. Aliases were used to protect the identity of internship participants, staff members, and community residents. Furthermore, the

qualitative data confirmed what was seen in the quantitative data, which is that interns experienced gains in all areas due to the YIP. The definitions for each theme were found in the literature. The definitions for the *a priori* and emergent sub-themes were developed from the data.

Career preparedness skills

CPS are the ability to do something well or complete a task in the workplace environment and included the *a priori* sub-themes of problem solving, life planning/goal setting, conflict resolution, constructive feedback, and active listening. There were 99 references to CPS in the qualitative data. Through analyzing these references, 1 emergent sub-theme was discovered which was called leadership. Evidence of *a priori* and emergent sub-themes in the qualitative data for CPS are discussed in the following paragraphs.

Problem solving was defined as finding solutions to problems that arise. More specifically, it included learning and/or using new strategies to deal with problems, individually or as a group, that already happened or might be foreseen in the future. Most interns demonstrated the skill of problem solving throughout the internship program, as interns often had to use this skill to complete tasks during fieldwork or farm stand. "[At farm stand] … a couple times we did not have all the necessary materials like crates to hold all the peppers we had. We had to improvise and had to use pint cartons" (Larry, interview, 8/14/2021).

Interns demonstrated life planning and goal setting when they were able to articulate goals for the immediate and/or distant future. All interns demonstrated the skills of life planning and goal setting mostly through educational lessons, such as setting SMART goals. "I'm most proud of finding a more confident and mindful version of myself. This achievement has carried me to building meaningful relationships with my community, which was my career goal at the beginning of the program" (Katie, journal response, submitted 8/13/2021).

The sub-theme of conflict resolution was defined as understanding interpersonal conflicts and working with others to compromise and facilitate a peaceful working environment. This included being able to recognize sources of disagreement and work as a team to resolve it. Most interns demonstrated conflict resolution skills during the YIP through working alongside peers and community members. "If you have a mindset of something being right… [people] may say [your idea is] wrong. To me, I'd take [that] as let's find another solution to this problem… you'd like to be right, but you have to come to some mutual agreement that's gonna benefit you both" (Pax, interview, 8/5/2021).

The sub-theme theme of constructive feedback was defined as the ability to provide and accept meaningful and realistic feedback to peers and community members in a peaceful manner. Almost all the interns evidenced constructive feedback skills. Constructive feedback was observed during internship activities such as cooking lessons and straight talk, where interns' progress is reviewed. "During straight talk, I had to take the corrective criticism that I answer other people's questions all the time and I know it's a big problem and it felt good that someone noticed it" (Willow, interview, 8/5/2021).

Active listening was defined as the skill of listening to others in an engaged and thoughtful manner without interrupting or dominating conversations. Interns showed the ability to stay attentive during lectures, field trips, and other learning and workplace activities. All interns demonstrated active listening at some point throughout the internship. Active listening occurred mostly during field trips because field trips allowed interns to learn alongside a variety of community experts. "One personal responsibility I'm working on perfecting is being present… To achieve this, I try to ensure that my energy is high, I'm actively listening, and distractions are put away" (Katie, journal response, submitted 7/2/2021).

Leadership was an emergent sub-theme which arose from analysis of the qualitative data. The following example from the qualitative data led to the emergent sub-theme of leadership, notably there were more examples of leadership in the data than what is provided below. Larry submitted a journal response on July 23rd which stated "I stayed on top of every job and task and was making sure to direct anyone without a certain task at the time. I volunteered every chance I had and took the first step in clearing an area for the garden beds, as well as carrying the lumber for building them." This journal response demonstrated how during fieldwork Larry completed his tasks, took initiative, and helped others. Through analyzing and coding the data, a definition for leadership was developed. Leadership was defined as the ability to take charge or initiative in a group setting, such as helping direct others to complete a task. Most interns demonstrated leadership during the internship program.

All interns demonstrated CPS throughout the internship. Skills were seen through analysis of interviews, journal responses, and participant observations. It was expected that all interns would demonstrate CPS throughout the YIP. The internship was a paid job; therefore, it was necessary for interns to develop and use the skills. These findings corroborate the quantitative data results.

Healthy living attitudes

HLA are thoughts or feelings related to health and wellness that may be reflected in one's behavior. Such attitudes were further defined by the *a priori* sub-themes of relationship between food and mood, self-efficacy, and mindfulness and balance. There were 112 references to HLA in the qualitative data. Through analyzing these references, one emergent sub-theme was discovered which was called general positive HLA.

Relationship between food and mood was defined as interns' understanding of how food choices affect the body mentally and emotionally and enhance the desire to make choices that they know will positively affect them. This included wanting to consume nutrient dense foods, limiting consumption of processed foods, and reducing sugar intake. All interns embodied positive attitudes about the relationship between food and mood. Attitudes toward the relationship between food and mood were noticed during health and wellness lessons and in conversations with interns. While talking to interns, they expressed how their meals changed after understanding how foods affect moods and to be more prepared for the physical demands of the internship. "If you're eating healthy, you'll have a good mental mindset and it'll change your mood. Like if I were to go to [a fast-food

restaurant] every day and if I eat some [fatty] meal I'll feel sluggish" (Duncan, interview, 8/12/2021).

Self-efficacy refers to the desire to practice advocating for personal health. This definition included standing up for oneself by voicing opinions and educating others about healthy choices. Self-efficacy is viewed as an attitude because it refers to interns believing in their abilities and choices to promote a healthy lifestyle for themselves and people around them. Almost all the interns expressed self-efficacy attitudes. Self-efficacy attitudes were mostly discovered through interviews as interns discussed how they incorporated healthy living into their lives outside of the internship. "I've been going to the grocery store with mom a lot more and voicing my opinions on what I want a lot more. [I've been] pointing out what's healthy, let's not do white rice, let's do brown rice or couscous" (Amy, interview, 8/11/2021).

Mindfulness and balance were defined as individual decisions being thought out and with a purpose (not impulsive). This included demonstrating balance in healthy and unhealthy choices such as exercise, eating habits, and work/life balance. It also encompassed wanting to or willingness to try new foods, which contribute to a balanced diet. "Mindfulness is important to a healthy lifestyle because it's being aware of your thoughts and feelings. You need to be in touch because it comes into play with balance, like hey maybe I'm overworking myself and maybe I need to balance" (Julian, interview, 8/5/2021).

General positive HLA was the emergent sub-theme for this section. This theme was discovered through analysis of interviews, as interns would explain attitudes that did not fully fit into other healthy living sub-theme categories. For example, through conversation interns expressed how they enjoyed healthy living aspects being taught, but they were not always able to adopt these practices for personal reasons. Some interns did not have access to the nutrient dense foods that they knew were most beneficial for their bodies. Nutrient dense foods can be expensive, making it impossible for all people to continuously afford. "I don't have many fruits and veggies at home… but I try to eat healthy as much as I can, and I'd like to get into making my own food, but I'd have to get my own food to do that" (Duncan, interview, 8/12/2021). Through recognizing healthy Living barriers and understanding the benefits of living a healthy lifestyle, interns developed general positive HLA. General positive HLA were defined by interns' expressing an overall positive feeling or thinking positively about healthy living. This included wanting or liking aspects of healthy living, even if they were unable to practice healthy living at the time (due to family situations, financial status, etc.). Most interns demonstrated general HLA.

All interns expressed HLA through interviews, participant observations, and/or journal responses. All *a priori* sub-themes for HLA were found in the qualitative data. The emergent sub-theme was discovered predominantly through analysis of interviews. The qualitative data aligned with what was previously discussed in the quantitative data, therefore further supporting that the YIP allowed interns to develop positive HLA.

Content knowledge

CK is understanding, comprehending, and/or mastery of facts and information about sustainable agriculture. CK was further defined by the *a priori* sub-themes of food pollution and waste, farm management practices, science of gardening, and farming. No emergent sub-themes were found for CK. There were 190 references to CK in the qualitative data. The following narratives explored how aspects of the YIP helped interns learn CK, therefore giving an in-depth look at aspects of the program that allowed participants survey mean scores to increase.

Food pollution and waste was defined as demonstrating CK on food pollution and waste, including possible problems and solutions related to the concept. Food pollution was defined as sources of pollution from food systems and how these food systems contribute to pollution. For example, this included how the industrial food system contributes to global warming. During an interview with Duncan, he spoke to the problems with food waste, "[Problems with food waste need to be solved because] if they are not then the problem, we already have could get a lot worse. We're already producing man made gasses and hurting the ozone layer" (8/12/2021). Food waste was defined as extra food that is not used during production, processing, distributing, and/or consumption. All interns demonstrated CK about food pollution and waste. Knowledge about food pollution and waste was demonstrated through various internship activities. Several YIP activities focused on composting which allowed interns to learn about the benefits of composting and negative effects of food pollution and waste. "Food waste is food that is produced and goes to waste and goes unused. It's bad because of methane emissions and it's a waste of resources" (Julian, interview, 8/5/2021).

Farm management practices were defined as demonstrating CK about how to transport food, soil management techniques, pest management, and effects of pesticides. This included management practices such as irrigation, cover cropping, composting, integrated pest management, and other sustainable agriculture techniques. An overwhelming majority of interns exhibited CK about farm management practices. Interns learned farm management practices though fieldwork where participants actively engaged in crop production and by engaging with community experts. For example, interns learned organic ways to remove pests. "Jennifer showed me this really good method for red bugs we get on squash, use veggie oil, soap, and water, and spray it on… Also, [plant] aromatics [because] bugs don't like the smell, so they won't come as often" (Lucille, interview, 8/12/2021).

Science of gardening was defined by demonstrating CK on how biodiversity plays a role in cultivating a healthy farm, how climate change affects crop production, environmental factors that influence when crops should be planted, plant life cycles, nutrient cycling, what makes healthy soil/why healthy soil is important to the cultivation of crops, and the science behind compost. For example, this included explaining what it means for a crop to be "in season" and how to tell if soil is healthy. Such knowledge was learned through fieldwork in garden spaces, engaging with community experts, educational lessons, and fieldtrips. Almost all the interns displayed science

of gardening knowledge. "Lucille asked the question, 'Compost needs air, so why are we stomping on it?' The other interns answered her question by saying we are stomping on it to compact it so we can fit more in the bin, but there is still plenty of air available" (Participant observations, 7/6/2021).

The sub-theme of farming was defined as demonstrating CK on components of farming, styles of farming (industrial, local, vertical, indoor, organic), and the role of farming in food systems. For example, this included articulating knowledge about the resources and tools it takes to run a farm. Furthermore, it also encompassed carrying out the actual act of farming observed through participant observations. Interns were able to gain farming CK by working in a local small-scale farm daily. The place-based nature of the program provided interns with baseline knowledge which they were then able to build upon by visiting different types of farms. Through seeing differences in farms firsthand, interns were able to compare a familiar setting to other types of farms and learn the difference between industrial and local farming. Liam briefly mentioned this during his interview, "If you want supreme access [to food] the way to do it is super-efficient industrial famers pumping out food, which is not good for the environment. But [sustainable agriculture] is good for the environment" (8/3/2021). This quote showed that interns could differentiate between styles of farming and how they affect food systems.

All interns demonstrated CK through interviews, journal responses, and participant observations during the internship. CK was primarily gained through internship activities such as engaging with community experts, field trips, and fieldwork. Fieldwork was especially helpful in gaining CK because it provided interns with hands-on opportunities to learn about sustainable agriculture, environmental literacy, and food systems.

DISCUSSION

These research findings appeared to confirm that learning occurred due to the place-based setting of the YIP, which in turn allowed situated learning to transpire. The intern as the novice learner was able to successfully gain skills, attitudes, and knowledge in the PBEE context, which ultimately allowed SLT to occur. As interns gained these skills, they began to move from the periphery to the center of community practices. The transition from the periphery to the center of community practices was evident through the gains observed in learning in both the quantitative and qualitative data.

Preparing for Life and Vocation

CPS are a common outcome observed and reported in relevant literature. Schusler and Krasny (2010) showed that EE programs allowed participants to gain not only knowledge, but also skills applicable in the workplace. Through building upon previous knowledge and supporting youth as they encountered new challenges, EE participants were able to develop skills that prepared participants for future jobs (Schusler & Krasny, 2010). Schusler and Krasny's findings are consistent with those in the present study, as interns in this study also developed these same skills, through the place-based YIP.

Positive HLA are another common outcome from urban agricultural programs. Several studies have found that working in garden spaces allowed individuals to become involved with food cultivation which led to social-emotional processes linked to overall health and wellbeing (Alaimo et al., 2016; Delia & Krasny, 2018; Diaz et al., 2018; Draper & Freedman, 2010; Gibbs et al., 2013; Hambright-Belue & Holland, 2016; Horst et al., 2017; Hung, 2004). This outcome was also seen throughout the YIP, as interns were exposed to the production of crops. Being involved in this process caused interns to learn about nutrition and try new foods which improved attitudes about mindfulness/balance. By feeling passionate about their garden work and feeling positively about mindfulness and balance, interns began to share knowledge and attitudes with family members. Sharing these educational experiences with family outside of the YIP was evidence of improved self-efficacy attitudes as interns advocated for their opinions about healthy living, as qualitative data noted.

The linear regression results exploring the relationship between CPS and HLA shed new light on the findings of the impact of situated learning in a place-based program. According to the researcher's present knowledge, there is no previously discussed outcome quantitatively linking CPS and HLA in a place-based garden program. The present research found that there was a strong statistical link between these skills and attitudes, which were strengthened throughout the YIP. CPS and HLA had a strong positive relationship due to situated learning allowing interns to simultaneously transform skills and attitudes in a place-based setting.

Content Knowledge as a Basis for Life and Vocation

CK was the area where all interns experienced the most growth. Due to the YIP, CK overlapped with attitudes and skills. This was seen through the quantitative and qualitative data. Looking at the regression results, one of the strongest relationships between themes was seen when looking at the effect of CK on HLA for all interns. This strong positive relationship indicated that learning gains under CK helped increase interns' HLA. An example of how the themes were connected could be seen through the relationship between farming and mindfulness/balance. As interns gained farming experience through fieldwork, they became familiar with a variety of different crops. Through tending to crops in garden spaces, interns increased their exposure to fruits and vegetables which allowed them to become familiar with the produce. Increased exposure led to increased curiosity about the crops, making the interns more likely to try new produce and contributing to mindfulness/balance. Alaimo et al. (2016) had similar findings, as their study showed how youth exposed to new fruits and vegetables expanded their produce variety and increased produce consumption.

CK was also connected with CPS. Since the YIP was place-based, interns had to use CPS in garden spaces where most internship activities took place. Simultaneously, garden spaces were a source of CK as interns engaged in kinesthetic learning through fieldwork. The place-based nature of the YIP created the perfect foundation for skills and knowledge to merge in one setting. Youth Internship Program expectations were that interns would strengthen and utilize skills during all activities, but many activities required learning CK. This was

seen through fieldwork. Interns had to communicate with each other to discuss how to effectively complete tasks in groups. This required problem solving, active listening, and leadership skills for example. Several other studies found similar findings. For example, Delia and Krasny (2018) found that a place-based agricultural program allowed participants to develop communication skills, increase academic performance, and practice leadership.

The qualitative findings about the intersection of CPS and CK were supported by the quantitative data. Regression analysis showed that the strongest relationships between themes were seen when looking at the effects of CPS on HLA and CK for all interns. This demonstrated that practicing CPS allowed interns to gain CK. Diaz et al. (2018) reported similar findings as their literature review found that garden programs enhanced academic performance, healthy eating habits, personal development, and community building.

CONCLUSION

A mixed methods approach was used to answer the research questions. Through analysis of the quantitative and qualitative data, it was found that the YIP was effective in positively changing all interns' CPS, HLA, and CK. Future research could benefit from looking at interns' development of skills, attitudes, and knowledge for all themes of career preparedness, healthy living, and content. This study was restricted by time constraints; therefore, skills, attitudes, and knowledge could not be assessed for all themes. Such research would provide a more holistic idea of how skills, attitudes, and knowledge regarding career preparedness, healthy living, and content intersect in a place-based garden setting through SLT. Future research could also benefit from evaluating long-term learning. This study focused on immediate outcomes; therefore, the long-term effects of the YIP are currently unknown. Overall, the YIP was successful in transforming all interns CPS, HLA, and CK. However, the program was impactful beyond the scope of just these immediate outcomes. Interns experienced personal and social transformations which allowed them to be better individuals, co-workers, and community members.

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