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AT THE WELLESLEY CENTERS FOR WOMEN

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We Are Wise Owls

Early Prevention Using a Digital Video Intervention in the Afterschool Setting

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A recent survey of U.S. youth substance use showed that rates for alcohol, tobacco, and marijuana use were similar to those during the previous year—with a rise, however, in overdose deaths, possibly due to synthetic opioid abuse. About 20–30% of high schoolers reported vaping, with a small increase in vaping cannabis in the preceding year. Past-year use of alcohol for high school seniors was 52%, between 6% and 8% of high schoolers reported illicit drug use other than marijuana, and over one-fifth of middle schoolers perceived taking prescription narcotics as high-risk behavior (National Institute on Drug Abuse, 2022).

Initiation of substance use may be due to a youth's natural curiosity about substances, media exposure, or easy availability of products such as alcohol or tobacco (Chadda, 2019). Although the age of initiation of these behaviors is generally in middle and high school, contributing individual, family, and community risk factors (such as parent and peer permissive attitudes and use, childhood trauma, school/academic problems, family troubles, and poverty/violence) can be experienced much earlier (National Institute on Drug Abuse, 2016). Developmental system models of substance use describe the risk factors—and interactions of risk factors—in childhood and adolescence that may be

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predictive of future use or addiction (Partnership to End Addiction, 2022).

Some individual and environmental risk factors experienced during childhood, such as family problems, are predictive of behavioral and conduct problems that manifest in grade school in conflict with peers and teachers. These problems may then lead to peer rejection, delinquency, and substance use in secondary grades. Specifically, problem behaviors during early and late elementary school were shown to be related to progressively delinquent behaviors and substance use in secondary school. Disadvantaged children who experienced risk factors before middle school were most at risk of future substance use or addiction (Partnership to End Addiction, 2022).

Early Prevention and Digital Interventions

A window of opportunity, therefore, opens for early prevention. With decreases in protective factors and increases in risk factors occurring during pre-adolescent and teen years, the elementary age may be critical. The earlier the initiation, the higher the risk for future problems (National Institute on Drug Abuse, 2016). Early childhood, therefore, is a key period for education about safe, healthy behaviors to prevent later substance use (Chadda, 2019). During this developmental period, a child's brain is growing and forming neurological connections that can be especially affected by these individual, family, and community risk factors. As children are attempting to successfully navigate the transition from the home environment to the academic and social environment of the school, their social–emotional and behavioral health may be affected by the same risk factors (National Institute on Drug Abuse, 2016).

Substance use prevention literature focusing on population-based interventions supports the effectiveness of life stage-based early prevention interventions for children. Investments in evidence-based, universal prevention interventions (targeted toward a general population and considering all as "at risk") in early childhood seem to reduce later costs for drug treatment, poor health, and academic problems—not only socially, but also economically (Fox et al., 2015).

Problem behaviors during early and late elementary school were shown to be related to progressively delinquent behaviors and substance use in secondary school.

Elementary school is an ideal age and setting at which early prevention can be addressed. For example, a review found that at this age, many children could already identify and were aware of some effects of alcohol and acquired attitudes toward the substance from parents and adults, and their awareness and knowledge increased as they became older (Jones et al., 2017). Reviews and meta-analyses have indicated that universal, school-based prevention interventions at the elementary-age level have shown at least small, positive effects on alcohol, tobacco, and other drug use. The interventions that showed the most promise included strategies focused on social–emotional learning and healthy, alternative activities (Onrust et al., 2016).

Specifically, interventions focused on substance use prevention and improving personal and life skills in the early years are critical in this developmental stage to delay or prevent future use and pro-use attitudes. The health and social costs of substance use in children and youth can be considered a public health issue; effective interventions across the lifespan are needed. Because early childhood risk factors and early substance exposure can lead to later use and increased risk of mental health issues, early prevention is considered necessary (Nebhinani et al., 2022). Many states recommend starting school-based prevention education in the early elementary grades as a best practice, with continuing booster sessions throughout the elementary years (Pettingill, 2018).

Digital media interventions, including character-focused media, can include audio, video, and photos that may be an engaging and interactive prevention education strategy for elementary-aged children (Reid Chassiakos et al., 2016). Knowledge acquisition and cost-effectiveness were generally favorable with digital interventions, but they showed only moderate effectiveness for attitude changes (Pradhan et al., 2019). When digital interventions were studied for use in promoting and educating for general health in children and teens, limited effectiveness was demonstrated. However, effectiveness may improve when used as part of a multicomponent or hybrid intervention (Fernandez-Leon et al., 2025; Oh et al., 2022). Specifically, in universal substance

use prevention in the school setting, digital media interventions showed limited to some potential promise for reduced use, but studies have focused mostly on adolescents (Fernandez-Leon et al., 2025; Greene et al., 2021; Liu et al., 2023).

An overview of systematic reviews of mental health and substance use prevention interventions for elementary school students (and interventions extending through middle school) was also conducted. Universal interventions demonstrated some positive effects on academics, social behaviors, and substance use. The review found a lack of digital interventions, programs conducted outside the school setting, and interventions for the early elementary level, with recommendations for more study in these areas (Harrison et al., 2022).

Afterschool Prevention

With a focus on decreasing risk factors for substance use such as low age of initiation and permissive attitudes and use among parents and peers, community-based interventions can help positively influence a young person's likelihood of use and future use (National Institute on Drug Abuse, 2016). Thus, the afterschool setting may be another setting where early prevention interventions can be successful. A systematic review found that afterschool programs that promote general health and positive development for children and teens tend to improve participant self-worth and community involvement. Possessing these characteristics decreases youth susceptibility to risky health, social, and substance use behaviors (Donovan et al., 2025).

The afterschool setting may be another setting where early prevention interventions can be successful.

Afterschool programs generally provide students with extended learning and enrichment opportunities. Those that follow best practices such as standardized curricula and reinforcing activities have demonstrated increased academic achievement, school attendance, classroom participation, and improved social behaviors in student participants (Afterschool Alliance, 2017). One U.S. state's study showed mixed evidence for improved academic achievement but some positive outcomes for social behaviors, class participation, and health-related behaviors (Biddle & Mette, 2016). A longitudinal study of elementary afterschool student participants found that academic and social behaviors improved over time, with sustained program participation leading to better outcomes (Grogan et al., 2014). Participation in quality afterschool programs at the elementary level has demonstrated student improvements in social behaviors. Following developmental models, Vandell et al. (2021) determined that participation in early childhood education as well as afterschool programs during preschool and elementary school led to improved social behaviors in adolescence and fewer law violations in adults.

Purpose

Risk factors experienced in childhood may predict future substance use; therefore, prevention education should start early (Chadda, 2019; Partnership to End Addiction, 2022). Both school- and community- or afterschool-based prevention interventions may improve knowledge and skills leading to decreased risk factors for use (Afterschool Alliance, 2017). More studies on digital interventions and interventions in elementary-level and in afterschool programs were recommended (Harrison et al., 2022). Therefore, this exploratory study was undertaken to determine student participant knowledge and attitudes about healthy, drug-free lifestyles pre- and post-interactive digital video prevention intervention in an elementary afterschool setting.

Methods

Sample

After institutional review board approval, afterschool program administrator consent, parent/guardian consent, and elementary student participant assent, 42/42 (100%) elementary students in an afterschool program consented to study participation. The program was a collaboration between a youth-serving agency and a small, rural school district in a midwestern U.S. state. Student participants were in kindergarten through second grade. Thirteen kindergarten students participated, as did 14 first-grade students and 15 second-grade students. Most

students were boys (27/42, 64.3%), and almost all (38/42, 90.0%) were White.

Instruments

Demographic information was collected from participants; their pre- and post-program knowledge about healthy, drug-free lifestyles was measured using confidential tests included in the Wise Owl's Drug Safety Kit curriculum, based on effective, age-appropriate strategies for K-3 drug education (Human Relations Media, 2024). The three tests included 10 statements that related to the three topic areas covered in the program and took approximately five minutes each to complete. The researcher read aloud each statement in the test; students circled their responses as to whether the statement was "true" (visual of a smiling cartoon owl) or "false" (visual of a frowning cartoon owl) in the test. Examples of statements included in the Part 1 test (*Is that good for me?*) are "Fruit is good for you," "Sleep helps your brain think better," and "Exercise is harmful to your body." Examples of statements included in the Part 2 test (*What is a drug?*) are "Alcohol is a drug that can be smoked," "Tobacco is a drug that makes a person's heart beat faster," and "It's against the law for kids to buy or drink alcohol." The Part 3 test (*What is medicine?*) included statements such as "Medicines are drugs that can help you when you're sick," "Only doctors need to read medicine labels," and "If something looks tasty, it is probably safe to eat." Answer keys to these tests were provided with the curriculum. A correct response to a statement was assigned one point, and an incorrect response was assigned zero. Students could earn a maximum score of 10 points for each quiz.

Post-intervention participant attitudes toward healthy, drug-free lifestyles were measured using the confidential, qualitative "Draw-Write-Tell" technique. A long-standing, creative, child-centered method for gauging child perceptions in health education research, this technique allows children to draw how they feel, write an explanation, and then verbally explain to the researcher about their drawing without preset queries. This strategy decreases researcher interference and presents the child's interpretation as the key data point. Researchers then obtain holistic perceptions and themes by linking the objects, people, and places drawn with the child's verbal description (Angell et al., 2014). After the last lesson, the researcher's verbal prompt asked participants to draw how they felt about a healthy, drug-free life, using paper and pencil provided. Student participants drew a picture of their attitudes in a box provided on a worksheet. Next, they wrote and verbally explained their picture to the researcher, who also took notes.

Procedure

An afterschool program (a partnership program between a school district and a local YMCA) was held on-site in three elementary school classrooms for two hours after school dismissal. The typical program schedule in each room was supervised by a certified district teacher and included physical activity, a healthy snack, homework assistance, and a special event provided by community organizations. A substance use prevention coalition sponsored and presented the event "We Are Wise Owls."

Wise Owl's Drug Safety Kit's (Human Relations Media, 2024) curriculum uses interactive digital videos (live-action and cartoon videos relating to drug safety), followed by posters, active learning activity cards and worksheets, and cooperative learning games to instruct students to make healthy lifestyle choices, especially related to drugs and medicines. After each video, discussion and concept reinforcement followed using the fun, interactive activities.

A substance use prevention coalition sponsored and presented the event "We Are Wise Owls."

Adult volunteers from a community-based substance use prevention coalition reviewed the Wise Owl's Drug Safety Kit's teacher's resource book (Human Relations Media, 2024), student learning objectives, and ancillary materials. They then previewed the three digital video prevention lessons, with accompanying posters and activity cards and worksheets, to prepare and practice the lessons for afterschool program presentation. The program was presented once each week for three weeks for 45 minutes each session during the fall school semester.

Immediately before teaching each of the three lessons, the coalition volunteers administered the written pre-knowledge quiz for that lesson to student participants.

Lesson 1, "Is that good for me?", was then taught by the volunteers. In lesson 1's video, participants were introduced to the characters Wise Owl and his niece Wendy, who teach viewers about healthy, drug-free lifestyles. Using three vignettes, healthy food choices, sleep and exercise, and alcohol abstinence were covered as participants learned that some "cool" things are not always safe. An interactive, reinforcing activity based on video content followed.

The next week, in lesson 2, "What is a drug?", Wise Owl teaches Wendy about the dangers of alcohol and tobacco through three vignettes, reinforcing the benefits of a drug-free lifestyle and noting that those who make safe, healthy choices are cool kids. An interactive, reinforcing activity based on video content followed.

During the final week, in lesson 3, "What is medicine?", Wendy learns that medicines can help but must be used correctly and safely. The three vignettes cover asking an adult for help, how medicines may look like candy, and that taking someone else's medicine is not safe. An interactive, reinforcing activity based on video content followed.

Immediately following instruction in each of the three lessons, the coalition volunteers administered the written post-knowledge quiz to student participants. Immediately following lesson 3, the coalition volunteers also administered the written Draw-Write-Tell attitude assessment to student participants.

Analysis

Students' pre- and post-tests were scored following the answer key provided by the Wise Owl's Drug Safety Kit curriculum. A correct response to each statement was assigned a score of one point, and an incorrect response was assigned a score of zero. The total summed score for each test was calculated for each student. Independent *t*-tests were then used to determine differences in pre-post knowledge item score and total summed score for the three tests.

A modified version of Kuhn's thematic analysis was used to examine post-program themes regarding participant attitudes depicted in the Draw-Write-Tell pictures. Elements and text were identified in relation to their location, relationships, motives, and activities. Interpretation was based on how the elements and text influenced their attitudes and perceptions (Kisovar-Ivanda, 2014; Kuhn, 2003). Specifically, objects, people, and places drawn in addition to any text and verbal explanation were identified and categorized by three researchers using consensus to decrease bias. Interpretation of any relationships and influences on perceptions and attitudes was made with participant school and community culture in mind. Main themes were then determined through triangulation of the drawing-writing-telling.

Results

An independent *t*-test was conducted to evaluate whether student participants' knowledge about healthy drug-free lifestyles improved after participating in the three interactive digital video prevention lessons (see Table 1). Results were as follows:

- Lesson 1: The test for summed scores was not significant, $t\ (71) = -1.85$, $p = .068$, but results showed an increase in overall scores after participating in the lesson. Student participants' knowledge that "It is against the law for kids to drink wine" increased significantly, $t\ (71) = -3.51$, $p < .001$.
- Lesson 2: The test for summed scores was significant, $t\ (76) = -3.39$, $p = .001$, and results showed an increase in overall scores after participating in the lesson. Specifically, four areas of knowledge significantly improved after participating in this lesson: the understanding that the brain sends signals to the bodies to help with breathing, thinking, and talking ($p < .001$); "Beer is a kind of alcohol" ($p = .006$); "Cigarettes are made of tobacco leaves" ($p = .009$); and "Tobacco can be smoked or chewed" ($p = .009$) (see Table 2).
- Lesson 3: The test for summed scores was not significant, $p = .059$, but results showed an increase in overall scores after students participated in the lesson. Student participants' knowledge that "Medicines are drugs that can help you when you're sick" increased significantly, $p = .05$ (see Table 1).

Results of the modified thematic analysis (Kisovar-Ivanda, 2014; Kuhn, 2003) determined that, based on their post-program pictures, participants' attitudes about healthy, drug-free lifestyles were emphatically "anti-drug." Objects, people, and places drawn generally fell into two categories or themes: saying "no" to drugs and to not take someone else's prescribed medicines. Results were easily placed in cultural context with the help of the participants, who

Table 1. Wise Owl Sum Score Table

	Pre/Post Test	*n*	*M(SD)*	Difference *M(SD)*	*t*	*p*
Part 1: "Is that Good for Me?" Sum Score	Pre	40	7.20(2.26)	–0.95(2.18)	–1.85	.068
	Post	33	8.15(2.09)			
Part 2: "What Is a Drug?" Sum Score	Pre	42	6.31(2.04)	–1.50(1.942)	–3.39	.379
	Post	36	7.81(1.82)			
Part 3: "What Is Medicine?" Sum Score	Pre	40	6.78 (1.86)	–0.69(1.61)	–1.88	.014
	Post	36	7.47(1.28)			

were excited to describe in detail all the features in the pictures they drew.

For kindergarten students, the message to "not take anyone else's medicines" was drawn in most (7/13, 54%) pictures as the primary theme, followed by a secondary theme of "eating healthy," with a few (3/13, 23%) pictures of apples. For first graders, the overall theme (9/14, 64%) was "say no to drugs, if offered." Pictures were drawn of owls with text saying "No." For second graders, pictures of family and friends with the themes of "saying no to alcohol, drugs, and cigarettes" were the most often (7/15, 47%) drawn. One text stated, "No, no, no drugs," and another, "I learned no to alcohol." Overall, most pictures described "saying no to taking other's medicines" and "saying no to any other type of drug" (see Figure 1).

Figure 1. One Student's Post-Program Illustration: "Do you want a drug? No!"

Discussion

This exploratory study examined a digital prevention intervention at the elementary level in an afterschool program. Starting substance use prevention interventions in the elementary years may positively influence future non-use (Chadda, 2019). Although many early prevention interventions are school based, programs conducted in the general community and in afterschool settings also show promise (National Institute on Drug Abuse, 2016). An elementary-level, afterschool-based substance use intervention was conducted by community volunteers that relied heavily on interactive digital videos to provide prevention content in a fun way for participants. After the intervention's completion, participant scores for overall knowledge of healthy, drug-free lifestyles improved, and they significantly improved their knowledge of how alcohol and medicines affect the body. Participant post-program attitudes about healthy, drug-free lifestyles were anti-use, as strong themes of "do not take anyone else's medicines," "say no to alcohol, drugs, and cigarettes," and "eat healthy" were evident.

Early Prevention and Digital Interventions

Prevention education at the elementary level is necessary because conducting prevention interventions after substance use patterns have already begun is too late. Problem behaviors experienced early in life are related to higher risk for future use (Partnership to End Addiction, 2022); therefore, the early elementary ages can be a critical period to introduce prevention education (Chadda, 2019). Although many young students were already aware of the negative effects of alcohol

Table 2. Wise Owl Lesson 2

Statement	Pre/ Post Test	*n*	*M(SD)*	Difference *M(SD)*	*t*	*p*
Alcohol is a drug that can be smoked.	Pre	41	0.439(0.502)	0.078(0.495)	0.689	.493
	Post	36	0.361(0.487)			
Alcohol changes how the brain works.	Pre	39	0.769(0.427)	–0.049(0.411)	–0.503	.312
	Post	33	0.818(0.392)			
Tobacco is a drug that makes a person's heart beat faster.	Pre	40	0.525(0.506)	–0.218(0.478)	–1.970	.001
	Post	35	0.743(0.443)			
Our brains send signals to our bodies that help us breathe, think, and talk.	Pre	42	0.691(0.468)	–0.309(0.346)	–4.287	<.001
	Post	35	1.000(0.000)			
Beer is a kind of alcohol.	Pre	42	0.619(0.492)	–0.267(0.423)	–2.854	<.001
	Post	35	0.886(0.323)			
Cigarettes are made of tobacco leaves.	Pre	42	0.643(0.485)	–0.246(0.417)	–2.681	<.001
	Post	36	0.889(0.319)			
Tobacco can be smoked or chewed.	Pre	42	0.595(0.497)	–0.262(0.438)	–2.690	<.001
	Post	35	0.857(0.355)			
Tobacco helps a person's lungs feel better.	Pre	41	0.732(0.449)	–0.125(0.408)	–1.335	.007
	Post	35	0.857(0.355)			
It's against the law for kids to buy or drink alcohol.	Pre	42	0.738(0.445)	–0.086(0.420)	–0.882	.074
	Post	34	0.824(0.387)			
Some grown-ups make choices that are not good for them.	Pre	41	0.683(0.471)	–0.123(0.440)	–1.220	.014
	Post	36	0.806(0.401)			

(Jones et al., 2017), participants in the current study were not; this program significantly improved their knowledge of how alcohol affects the body, that beer is alcohol, and that it was illegal for them to drink wine. Participants in the current study received age-appropriate, fact-based education reinforced by discussion with the community volunteers that may have helped improve knowledge scores. Starting prevention education early, as in the current study and recommended by many state education departments (Pettingill, 2018), may delay or prevent future use and pro-use attitudes (Chadda, 2019).

Problem behaviors at this early age as a result of family and community risk factor exposure may also lead to substance use in later years (National Institute on Drug Abuse, 2016; Nebhinani et al., 2022), especially for disadvantaged students (Partnership to End Addiction, 2022). Participants in the current study were generally from low-income homes, as the afterschool program was a partnership between the school district and a YMCA with many students' fees subsidized. Early prevention education for disadvantaged students may potentially decrease some risk factor exposure before middle school, where risk for future use increases (Partnership to End Addiction, 2022).

Although studied mostly in teens for prevention education with some limited effectiveness (Greene et al., 2021; Liu et al., 2023), digital media have been demonstrated to be an appealing teaching strategy

for this age group (Reid Chassiakos et al., 2016). The innovative, digital teaching strategy (use of technology for participatory education) used in this study, therefore, may have assisted in participant knowledge and attitude improvements. Possibly because of the interactive nature of the videos and the fact that the content was applied by the actors to everyday situations, participants' knowledge of those areas may have improved.

The curriculum also focused on positive attitudes and healthy, drug-free activities, similar to interventions in the literature that showed the most promise (Onrust et al., 2016). Participant attitudes post-intervention were strongly anti-drug and pro-healthy activities. The themes were action-oriented, such as "eat healthy, say no…" with pictures of fruits and vegetables and of participants saying no to peers. Again, because community risk factors such as parent and peer permissive attitudes toward use can be experienced in the elementary years (National Institute on Drug Abuse, 2016), pictures showing students taking action post-intervention through behaviors such as resisting peer pressure and making healthy choices is encouraging.

> The hybrid approach of lecture and digital seems to improve overall curricular effectiveness.

Afterschool Prevention

Community-based interventions, as in the current study that used community volunteers, can positively affect substance non-use in youth (National Institute on Drug Abuse, 2016). The discussions with the community volunteer facilitators—adults who were not the participants' regular teachers—about the video messages to make healthy lifestyle choices, especially about drugs and medicines, may have also reinforced prevention facts learned. It seems, overall, that participants showed some knowledge improvement and possessed anti-use attitudes after the digital media-based, afterschool intervention. Results of the current study in the out-of-school setting are like those demonstrated by universal, school-based programs (Harrison et al., 2022). Both found at least some positive outcomes, possibly because of the focus on social skills and healthy lifestyles (Onrust et al., 2016). Because afterschool enrichment programs may also decrease antisocial actions and improve health-related behaviors (Biddle & Mette, 2016), substance use prevention knowledge and attitudes could also be indirectly affected. In addition, these improved social actions and healthy behaviors are characteristics that decrease susceptibility to future substance use behaviors (Donovan et al., 2025).

Limitations

There are several limitations to this study. With a small sample size and from only one afterschool program for an exploratory-type study, generalizability is restricted. Although a one-group pre-post-test design for the knowledge quiz allowed testing under the control condition and then after the intervention, there may be other reasons, in addition to the lack of a control group, for our significant pre-post-test differences. Participants may have learned and remembered content (testing effect) from the pre-test, as each pre-test was given immediately before and each post-test was given immediately after each lesson, or another prevention lesson or activity may have been taught at school or through the media during the intervention period. In addition, the true-false style questions, although in a brief, age-appropriate quiz with pictures of owls as true-false symbols, may have allowed more guessing than other question types.

The addition of the qualitative Draw-Write-Tell method may have favored certain students with more artistic talents over the others. In addition, researcher inexperience in interpreting the student-drawn pictures may have biased the results. Moreover, with no pre-drawing, it cannot be determined whether there was a change in participant attitudes or if they were already strongly anti-drug before the intervention.

Implications for Early Prevention in the Afterschool Setting

Because the intervention in this current study demonstrated some positive effects similar to those of school-based programs, conducting interventions in the out-of-school time setting may be promising, especially for elementary-aged students. As part of enrichment activities, events, and programs in afterschool time, program directors and community substance use coalition leaders can work together to implement fun, educational, and effective prevention programming. Using the technology in school classrooms provided in the afterschool program, interventions featuring interactive,

digital video media can be delivered easily, and prevention programming can start earlier to try to mitigate individual, family, and community risk factors leading to substance use initiation by middle school.

Interestingly, adult volunteers' informal "debriefing" after each lesson indicated that they perceived that participants learned best when the information in the videos was immediately applied in "What would you do…?" scenarios, and they were excited that participant answers were factually correct. Volunteers noted that the participants were engaged in every lesson through active listening, asking questions, and completing activities. During conversations with volunteers, participants recognized healthy behaviors and prevention techniques, and practiced resistance skills. As lessons progressed, the participants continued to recall what they had learned from the previous lessons. Afterschool professional teaching staff present during the program remarked that participants seemed excited to listen to the volunteers, especially with the use of the videos. Ending each lesson with physically active and socially interactive review games also seemed to reinforce how fun it was to make healthy, positive behaviors a daily habit. Participants were also excited to tell the researchers all about their drawings. Researchers gleaned a wealth of information from the explanations that assisted in their thematic analysis.

Results also suggest that interventions for elementary-school students that are of short length and brief duration may still be effective. For afterschool directors, integrating effective substance use prevention interventions into a two-to-three-hour timeframe that must include physical activity, homework help, and other scheduled events may be challenging, but is now doable. For community prevention coalitions, although time-consuming, volunteering to facilitate interventions in the afterschool is a viable strategy to get the anti-drug message out to a receptive audience. Continuing and sustaining early substance use prevention interventions in the elementary afterschool program could lead to improved knowledge and behavior outcomes as do other programs described in the literature (Grogan et al., 2014).

Pre-packaged and digital prevention interventions, too, can make lessons easier for non-teachers like community volunteers to instruct in the afterschool setting. Pre-packaged, standardized lessons require only short preview and practice sessions, and curricular fidelity can be enhanced using digital interventions (Fernandez-Leon et al., 2025). More cost-effective than face-to-face life skills interventions, digital interventions can be integrated into those face-to-face lessons. The hybrid approach of lecture and digital seems to improve overall curricular effectiveness (Pradhan et al., 2025).

As this was an exploratory-type study that demonstrated some positive effects of a digital media intervention on participant knowledge and attitudes of healthy, drug-free lifestyles, confirmation of results in larger studies with control groups would be the next step. Other suggestions for future research are to examine whether any healthy behaviors that were drawn by participants were observed by their teachers, even in the short term. Furthermore, for the long term, it is recommended to track participants longitudinally to follow their future use or non-use patterns.

Conclusion

Elementary school-aged children experience risk factors that are predictive of future substance use, but this age is far before they typically receive drug prevention education. The digital video-based, afterschool intervention in this exploratory study can bridge this gap. Interventions in afterschool settings allow students to receive extended learning opportunities that may have helped increase participant knowledge about healthy, drug-free lifestyles. Moreover, qualitative results demonstrated participant positive attitudes toward healthy, non-use activities. Although the afterschool intervention program in the current study was of short length and duration so it could be developmentally appropriate for early elementary-age students, it did demonstrate promising results.

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From Makers to Mentors

Building STEM Learner and Teacher Identities

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Makerspace activities and creative science, technology, engineering, and mathematics (STEM) projects in afterschool environments can help youth develop academic content and problem-solving skills while expanding what it means to do STEM (Peppler et al., 2016; Yang et al., 2025). These opportunities support students in developing a "STEM identity," defined by Chiu (2024) as "how individuals know and name themselves, who one is or wants to be, as well as to how one is recognized by others" (p. 90).

Afterschool makerspaces can be powerful contexts for learning and identity development, but educator preparation is necessary to provide these opportunities. Educators in and out of school often lack the disciplinary knowledge and the pedagogical content knowledge to lead STEM activities (Freeman et al., 2009; Haverly, 2017). More research is needed on how

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to support pre-service educators in teaching STEM, particularly through out-of-school-time (OST) programs that shape identity development. Therefore, our project investigated how facilitators benefit from these experiences and what they learn from leading STEM maker activities in OST environments.

In this article, we consider the programmatic elements that influenced STEM identity development for undergraduate facilitators and provide recommendations for supporting facilitators in OST STEM learning environments. We start by introducing our afterschool making program at two public elementary schools in California. We expand on our experiences as undergraduate facilitators leading and researching maker activities that were developed to encourage positive STEM identity development for diverse groups of third through sixth graders.

To focus on supporting undergraduate facilitators' STEM identity development, we asked the following research questions:

1. What factors support facilitators in developing confidence and competency in teaching STEM?
2. What recommendations do undergraduate facilitators have for those who want to implement afterschool makerspace activities?

We aim to support facilitators in developing confidence and competence in teaching STEM that can translate to their careers as STEM-empowered educators.

What Is the "Maker Mindset" and How Does It Help Students?

The "maker movement" has spurred engagement in science and engineering in a hands-on, informal setting, supporting youth STEM identity development (Fasso & Knight, 2020; Hsu et al., 2023). Making involves hands-on learning of STEM concepts, with a community of thinkers who design and build objects for both playful and useful ends. We define "makers" as people who investigate, wonder, and create products, or solutions to problems, using their imagination, creativity, and knowledge. Makers use a mix of tools, traditional crafts, electronics, and new technologies in a process that is learner centered and project based (Honey & Kanter, 2013; Peppler et al., 2016).

The "maker mindset" includes the values, beliefs, and dispositions of being playful, growth-oriented, failure-positive, and collaborative (Martin, 2015). Makers also leverage ideation, problem solving, and resourcefulness (Peppler et al., 2016). These values help students work together and view challenges as opportunities to learn collectively. Creation of artifacts, learning in community, and playful experimentation provide opportunities for both hands-on learning and broadening perceptions of STEM (Sharples et al., 2013). The maker movement has increased access to STEM for many, and it can be leveraged to reach historically underrepresented groups, such as girls and students of color who face additional barriers to STEM careers and opportunities (Ambrogio et al., 2018; National Research Council, 2010).

The afterschool makerspace context blurs the line between informal and formal learning and allows for "alternative cultures" within STEM. Makers often incorporate interests such as music, art, cooking, welding, software, and robotics, lowering barriers to participate and legitimizing diverse STEM identities (Calabrese Barton et al., 2017;Wittemyer et al., 2014). Educators can support diverse makers by providing an authentic, community-based context, valuing various skillsets, and encouraging students to learn from each other (Calabrese Barton et al., 2017; Holbert, 2016; McBeath et al., 2017).

Many OST maker programs leverage role models and mentoring to broaden participation. Maker mentors can help youth feel welcome and take on complex projects, encouraging creativity and problem solving (Alper, 2013; McBeath et al., 2017; Rees et al., 2015). In particular, undergraduate facilitators in a university–community partnership can be a critical resource for programs that provide STEM opportunities for school-age youth (Muller et al., 2021). College student mentors can be leveraged as "STEM ambassadors" in afterschool programs, teaching youth about STEM fields and helping them envision a future in STEM (Rees et al., 2015; Wittemyer et al., 2014). However, although leveraging the maker mindset and mentorship appear promising, more educator preparation is necessary to provide these opportunities for youth STEM development.

Developing Confident and Competent STEM Teachers: Maker Mindset for Teachers

The production of teachers in STEM fields has declined in the past ten years (Nguyen, 2025).

Furthermore, fewer than half of elementary teachers in the United States report feeling well prepared to teach science, with only 4% of elementary teachers expressing confidence in their abilities to teach engineering (Trygstad et al., 2013). This is problematic considering that in the Next Generation Science Standards, engineering is one of the four core science disciplines and features prominently in the Science and Engineering Practices that span all grade levels (NGSS Lead States, 2013).

> The "maker mindset" includes the values, beliefs, and dispositions of being playful, growth-oriented, failure-positive, and collaborative.

OST facilitators express a similar lack of confidence teaching STEM content. Most afterschool programs rely on "youth workers with little science background" (Freeman et al., 2009, p. 3). Afterschool facilitators have relevant expertise in socioemotional and cognitive development, as well as teaching skills that can translate well to leading STEM projects with youth (Freeman et al., 2009; NASEM, 2025). However, very few people have formal training in both knowledge bases of STEM and OST facilitation (Freeman et al., 2009). This creates a common yet significant challenge in providing regular science programming at afterschool sites. Barriers to facilitator training include a lack of funding, focusing on non-science content areas, and limited opportunities for science-specific professional development (Bradshaw, 2015; Freeman et al., 2009). Despite the "gap between intention and implementation," afterschool program leaders are motivated to support facilitators and improve both the quantity and quality of their science offerings (Bradshaw, 2015, p. 46; Freeman et al., 2009).

Helping undergraduate facilitators develop confidence in STEM content and teaching could be one solution to address a significant need for more STEM-empowered teachers and OST staff. Teaching maker projects in an OST context provides opportunities for pre-service educators and future facilitators to build content knowledge and pedagogy related to science and engineering.

We believe that embracing a "maker mindset" as both learners and teachers can help novice educators build confidence and competence in STEM instruction. Schoolteachers and OST facilitators naturally employ resourcefulness and creativity as they design and adapt lessons. Afterschool educators often excel in flexibility and problem solving, but Carey (2024) argues that all teachers are "educational engineers"—educators who observe students, design lessons to meet their needs, and revise plans throughout the process (p. 3). Valuing this lesson design and revision process is especially relevant for OST facilitators, considering that most afterschool programs report that they "self-create" all science activities and materials (Freeman et al., 2009). Reframing engineering as everyday problem-solving can help teachers, including OST facilitators, recognize and value this role in their practice.

In addition to reframing the lesson design and teaching process, teachers in and out of school can benefit from making connections between the engineering design cycle and everyday problems. For example, finding a way to level a wobbly table at home could help teachers reconceptualize engineering. Teachers who view engineering as more relatable are more likely to feel confidence in engaging in STEM problem-solving activities with their students (Carey, 2024). When teachers see through the lens of an educational engineer or a "maker," the potential exists to strengthen their STEM and teacher identities. OST facilitators can also benefit from demystifying a typically intimidating subject for someone without formal STEM training.

Although this work offers valuable insights, more research is needed on how facilitators develop STEM content and teaching identities, while fostering STEM identity development for the youth they facilitate. Only a handful of studies have reported on how undergraduate facilitators' STEM identities have benefited from implementing interdisciplinary projects (Cano & Arya, 2023; Martin & Betser, 2020; Marshall et al., 2019). Through this study, we seek to find ways that these experiences shift undergraduate facilitators' views of themselves as STEM teachers and learners.

Program Overview

Our program builds on the Mobile Making model, which positions undergraduate students as mentors in afterschool STEM spaces (Hansen et al., 2025). Near-peer mentoring, a research-based practice,

supports both youth engagement and undergraduate facilitators' development as STEM educators (Price et al., 2023). Undergraduates facilitate STEM-focused maker projects for third to sixth graders through an afterschool program. The sessions are designed to align with the "maker mindset": hands-on, creative, and collaborative, while engaging small groups in problem solving. This program is a university–school partnership that is part of a multi-site project. In the fall of 2022, the Mobile Making program expanded to four universities throughout California and their surrounding school districts. University faculty in STEM education work with university staff, afterschool leadership, and undergraduate facilitators to provide inclusive and engaging maker activities for STEM-underrepresented youth (Hansen et al., 2025; Price et al., 2016, 2023; Siyahhan et al., 2023).

University Context

Our study context is an emerging Hispanic-serving institution and one university in the Mobile Making program. Undergraduates meet for a service-learning class titled "Makers in Out of School Time" (MOST) twice a week on campus to learn the material and finalize maker projects. Class topics include growth mindset, encouragement instead of praise, and student-led thinking. Undergraduates make, adapt, and troubleshoot maker projects to prepare for teaching youth and ensure an appropriate level of challenge. Each undergraduate facilitator devises their own lesson plan for their group of students, which allows freedom to choose how sessions run and projects are accomplished. After a few weeks developing and trying out activities, undergraduate students meet on campus once a week and at the school site for four weeks. Each quarter, undergraduate facilitators receive 12 hours of training through the service learning class before going to the school site and an additional 12 hours of experience at the site. Undergraduates are paid for the time spent at school sites and receive credit for taking the support class. In total, over the course of three years, 23 undergraduates have facilitated 25 hours of maker programming for nearly 100 elementary school students.

Afterschool Maker Sessions

Undergraduate facilitators guide elementary students from an afterschool program in developing STEM-based maker projects. The school district serves an ethnically diverse community, with 79% Latinx students and over half qualifying for free or reduced-price meals (Ed Data Partnership, 2022). Small groups pair two to five students with each facilitator. Projects include paper circuits, flashlights, scribble bots, lava lamps, catapults, roller coasters, and pinwheels (see Figure 1). Each one-hour session features an icebreaker, a lesson overview, vocabulary introduction, and hands-on project time. Students also complete weekly Maker Journal entries, documenting observations, drawings, questions, and reflections on the projects and their identities as makers.

Theoretical Framework: Teacher as Learner

The construct of "identity" can provide insight into how facilitators navigate educational pathways and develop skills relevant to science and teaching (Varelas, 2012). From a sociocultural perspective, identity is created moment by moment through actions, relationships, and culturally and historically defined norms of behavior (Calabrese Barton et al., 2013; Silseth & Arnseth, 2011). People engage in a process of "becoming" based on their performances and others' recognition (Carlone & Johnson, 2007; Urrieta, 2007).

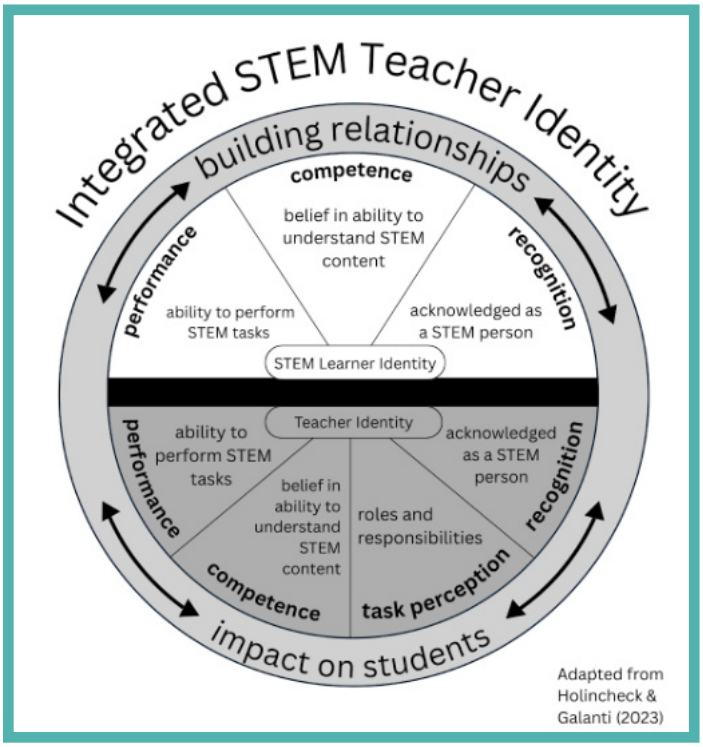
To understand STEM learner and teacher identity development for undergraduate facilitators in our program, we used the Integrated STEM Teacher Identity framework (Holincheck & Galanti, 2023). STEM identity for learners depends on the constructs of *performance*, *competence*, and *recognition*, as well as *STEM content interest*. The added construct of STEM content interest refers to the curiosity and a desire to learn STEM content. Mirroring the STEM learner identity, teacher identity includes similar constructs of *self-efficacy* (feeling capable in STEM teaching abilities) and *teaching interest* (curiosity and desire to learn how to teach STEM). Teacher identity also includes constructs related to teaching philosophy, methods, and goals, including *task perception* (roles and responsibilities as a STEM teacher), *motivation* (rationale for integrating STEM into the classroom), and *self-image* (awareness of abilities and their potential).

We modified Holincheck and Galanti's framework into the Integrated STEM Teacher Identity Coding Framework (see Figure 2). This framework offers insight into supporting facilitators, who are also learners, in developing STEM identities. The

Figure 1. Afterschool Maker Activities (from top left, clockwise: scribble bots, paper circuits, roller coasters, and pinwheels)

Integrated STEM Teacher Identity lens highlights the importance of supportive environments in which novice educators can lead STEM activities and grow into their roles, especially those who do not initially identify as "STEM people." It challenges the notion that one must be a STEM expert to teach effectively, showing that confidence and competence develop together. Integrating STEM and teacher identity bridges the gap between knowing STEM and knowing how to teach it. As future educators gain hands-on STEM experience, they feel better prepared to teach it in engaging ways. Ultimately, this framework aims to foster diverse, STEM-empowered educators by supporting their dual identities as teachers and learners.

Figure 2. Integrated STEM Teacher Identity Coding Framework



Research Design

A design-based research (DBR) approach was used to collect and analyze data. DBR supports the dual goals of informing local practice and providing insight into complex issues, producing a model of learning and innovation that applies on a broader scale (Barab & Squire, 2009; DBR Collective, 2003). Engagement in program design is flexible, ongoing, and codesigned with researchers and practitioners; as such, findings should be applicable and accessible to practitioners

(Anderson & Shattuck, 2012; Collins et al., 2004; Wang & Hannafin, 2005).

Research Team

The research team consisted of two faculty advisors and three undergraduate researchers who acted as teacher-researchers. Two of the co-authors were initially facilitators in the afterschool maker program and in subsequent years took on leadership roles called "STEM Ambassadors," in which they trained new facilitators and engaged in program research. One co-author participated in the research project by interviewing participants and analyzing qualitative data.

Participants

A focal group of five students who participated in the program for multiple quarters were purposefully selected for interviews because of their extended participation, allowing for a more robust understanding of how facilitators' STEM identity develops over time (see Table 1 for participant demographics).

Data Collection and Analysis

We invited facilitators with more than one year of program experience to be interviewed; five participated in the fall of 2024. Three undergraduate researchers, also co-authors, conducted semi-structured Zoom interviews following Spradley's ethnographic guidelines (1979). Interviews lasted 32–53 minutes and included 18 questions about participants' roles, teaching philosophy, and STEM identity, focusing on their feelings of competence, learning, and teaching STEM content. All interviews were transcribed for analysis.

A team of four teacher-researchers performed structural coding (Saldaña, 2012) on transcripts of the interviews, according to Holincheck and Galanti's (2023) model of integrated STEM teacher identity. First-round coding included the broad categories of Teacher Identity and STEM Learner Identity (see Figure 2 for our theoretical framework). Teacher identity included the teacher role, recognition as a teacher, as well as self-efficacy as a teacher, combining the constructs of STEM teaching performance and competence. STEM learner identity included STEM efficacy (performance and competence) and recognition as a "STEM person."

STEM learner identity included STEM efficacy (performance and competence) and recognition as a "STEM person."

Emergent subcodes such as *facilitator recommendations*, *connections with peers*, and *impact on students* were developed and refined through group discussion First, the research team coded one transcript together, discussing questions and revising the coding scheme.

Table 1. Participant Demographics

Participant Name	Program Role	College Major	Gender	Race	Participation in Number of Quarters (10 weeks each)
Maria	STEM Ambassador/ Facilitator	Education	Female	Hispanic/ Latino	5
Clay	STEM Ambassador/ Facilitator	Education	Nonbinary	White	5
Eleanor	Facilitator	Environmental Management and Protection	Female	Asian/ Pacific Islander, White	4
Emma	Facilitator	Education	Female	White	4
Isaac	Facilitator	Education	Male	Hispanic/ Latino	3

Note: All participants were given pseudonyms.

Then, each interview transcript was assigned to two researchers, who coded them individually before the whole group met to review any discrepancies and discuss until reaching a consensus.

Findings: Facilitator Confidence and Competency in Teaching STEM

Many undergraduate facilitators entered the afterschool maker program with hesitancy due to their self-perceptions about their knowledge and ability in STEM subjects. Although Eleanor, a STEM major, entered with a high degree of subject confidence, the other facilitators, with education majors, reported feeling like they "didn't know enough" and found science and engineering "intimidating." Facilitators often had a "bias against science" from negative experiences in school science. This led facilitators to feel nervous about teaching science, even expressing feeling like an "imposter." However, after engaging in class sessions that allowed them to practice and prepare for teaching and leading maker activities themselves, facilitators felt "successful" and "very confident," with one facilitator stating that she became a "different person from when [she] started." All five facilitators reported a shift in their confidence and competency in teaching maker-based STEM activities after their participation in the program. Our findings indicate that this shift in STEM identity stemmed from three factors: 1) a new perspective on STEM as everyday problem solving; 2) a focus on productive failure in maker activities and teaching; and 3) recognition by others as a STEM person.

Reframing STEM as Everyday Problem Solving

Facilitators felt more confident teaching when the program reframed maker-based STEM as being focused on critical thinking, rather than predetermined knowledge that the teacher transfers to the student. This shift to viewing everyone as a critical thinker and problem solver in the learning process was described as a "different way to be taught" that was important for both education and STEM majors. Viewing maker-based STEM as collaborative problem solving allowed facilitators to intentionally break down barriers to professional engineering for their students by framing the tasks as an opportunity for creativity—a much less formulaic approach than their previous, more traditional views of STEM subjects. We shifted our maker projects to design challenges that focused on the engineering design process, encouraging students to test new solutions and iterating their designs. For example, when students created spinning tops, they were given a model of a top that worked, but they were also provided with a variety of materials and given freedom to try to recreate the model or experiment with various materials while tweaking their design based on the outcome. These projects with multiple possible outcomes helped facilitators guide more open-ended, student-led sessions rather than giving step-by-step instructions.

This shift from teacher-centered practices to more student-driven problem solving allowed facilitators to see students gain knowledge through collective problem solving. Facilitators came to understand that the thinking and reasoning involved in the problem-solving process are more impactful on learning than the specific content the lesson is designed to support.

Modeling productive failure, one of the key tenets of making, influenced how facilitators viewed their teaching.

This new perceived freedom to think creatively made STEM feel more accessible to both facilitators and students. Leveraging this type of problem solving meant that facilitators and students saw the everyday relevance. One facilitator noted the importance of making the activities relate back to the students' lives. When students and facilitators could see how the content related to their world, it was easier for them to think creatively and engage in those reasoning processes because they drew on their own experiences to work through roadblocks.

Focus on Productive Failure

Another shift in mindset that changed facilitators' views on competence was the focus on productive failure. Modeling productive failure, one of the key tenets of making, influenced how facilitators viewed their teaching. By trying out the same activity multiple times, and improving it each time, facilitators reported developing more confidence. Maria stated, "We went through so many projects. We failed so many times. So that's definitely built my confidence."

For example, the facilitators tested a paper circuit project several times before teaching it, allowing opportunities to find solutions to problems. This gave facilitators confidence when failure occurred with students. When the LED bulb did not light up, they knew what areas of the project to check. Maria elaborated that expecting failure and going through it so many times took away the negative connotations with failure. It was simply part of the process. Within each moment of failure there was something to learn from the experience that helped her build a deeper understanding of the content as a learner. Each failure also increased Maria's ability to predict what could go wrong with the students' iterations of the project, which supported her preparation as a facilitator.

Throughout our study, facilitators consistently emphasized the importance of implementing and modeling a "growth mindset" for both their students and themselves as facilitators. Focusing on failure as a natural component of learning made activities more engaging for students, because no idea was off the table. This focus also shifted facilitators' views of teaching STEM. Clay expressed how developing a growth mindset was one of the areas in which they needed to shift the most in their thinking to "realize that it's not going to be perfect" and to "not beat myself up over it when things go wrong." Eleanor echoed this with her comment that "at the beginning I wouldn't have thought of a growth mindset, and how success and failure aren't exactly black and white. … [This experience] helped me adapt my mindset and seeing the success/failure definitions change, and seeing how a growth mindset can be applied more in situations into our teaching." Even though Eleanor came in with a high degree of confidence and competence as a STEM major, she reported that the program "has helped my confidence in my STEM identity, because the different style of teaching in the mindset … made me see that failure isn't really gonna take away that identity. And I think that being able to teach STEM kind of helps my confidence as well, because if I can teach it, then I can do it." These examples show the benefits of a productive failure stance for developing confidence and competency in STEM teaching for both STEM and education majors.

Not all failure, of course, is productive in complex, hands-on projects. If a project continues to fail after multiple revisions, it may be best to retire it. Conversely, if a project is too easy and requires no iteration, it misses opportunities to build confidence and problem-solving skills. Empowering teachers as "educational engineers" with a "maker mindset" helps them recognize when to push through project setbacks and when to pivot—making thoughtful, student-centered decisions.

Recognition as a "STEM Person"

Recognition from others as a "STEM person" is shown to have a positive effect on a person's STEM identity (Carlone & Johnson, 2007; Stapleton, 2015; Urrieta, 2007); the most notable form of recognition within our data was the perceived recognition from facilitators' peers. Facilitators felt a shift when they took on roles as leaders and trained other facilitators. Clay reported, "I feel most like a STEM person when we're learning the projects and I'm able to help my peers, like maybe if there's a concept that I'm familiar with I'm able to help in that way. It makes me feel like a STEM person." Similarly, Maria stated, "I felt like a STEM person. I felt like my peers saw me [as one] because I talked about my experience, and that I was confident." For both Clay and Maria, that added layer of mentoring the other facilitators supported them in developing their own STEM identity because their peers looked to them for guidance. Maria added, "It wasn't until teaching the college students [that] I felt like, 'Oh, I'm really comfortable [with the STEM content]'." It is one thing when children view an adult as a "STEM person," but it adds a level to one's own STEM identity when undergraduate facilitators are viewed as "STEM people" by their peers.

Recognition from others as a "STEM person" is shown to have a positive effect on a person's STEM identity.

Recommendations for Afterschool Makerspace Activities

Based on their experiences facilitating maker activities in afterschool programs, facilitators provided the recommendations that follow for those who would like to implement similar makerspace activities in their afterschool programming. The ideas of focusing on growth, iteration, and meaningful relationships

connect to high-quality OST practices, including a flexible facilitation style, lessons that build on each other, positive youth peer relationships, and supportive relationships with staff (NASEM, 2025).

Recommendation 1: Focus on Effort and Growth over Perfection

Facilitators recommend promoting STEM learning in both themselves and in their students by focusing on effort and growth over perfection. As facilitator Eleanor stated, "Don't stress out about making mistakes. It's good to model making mistakes to [the students]. They need to see that it's okay as much as you do." By using a growth mindset as a guide for themselves and modeling this for their students, facilitators can promote a makerspace culture that accepts and even celebrates failure as an opportunity to learn. In turn, this lens of productive failure will support STEM identity development for both students and facilitators.

The OST context can provide the perfect context for failing productively. With a focus on flexible content driven by youth choice and not limited by school standards, facilitators can truly emphasize the learning process. In addition, OST facilitators can experiment and become more confident with STEM content with which they are less familiar, while leveraging their expertise in cognitive development, problem solving, and socioemotional skills.

Recommendation 2: Iterate, Iterate, Iterate

Facilitators also recommend choosing projects that provide opportunities for students to iterate and refine their ideas within a limited time frame. Facilitator Clay shared the importance of "choosing [projects] so you have multiple opportunities to revise and fix as you go—rather than a big project that you can only tell if it works at the very end." Testing and revising a design form a key part of the engineering design process. We recommend that facilitators narrow the scope of their projects to prevent cramming for time, or engage in a larger project across multiple days. This process allows lessons to build on each other, which is a luxury that the afterschool program space provides, as most students attend programs five days a week. Furthermore, facilitators learning through iteration can help build up both STEM learner and teacher identities.

Recommendation 3: Build Meaningful Relationships with Students

Another topic facilitators emphasized is the importance of building meaningful, trusting relationships with youth. Beyond the STEM content, undergraduate facilitators are in the position of mentors and role models for elementary students. Decades of research on OST contexts indicate the power of programs in fostering relationships between adults and youth, and how youth feel comfortable learning in OST because they can "be themselves" (NASEM, 2025, p. 177). Our facilitators shared the value of "getting on their level" by having equal roles with the students in collaborative problem solving. Isaac noted the importance of creating an interactive space where students are engaged in communicating with mentors and each other about both STEM content and their lives outside the program. He emphasized, "That is how they start to build trust. And that's how they start to listen to you. And that's how they start to engage. [Even] more is when you kind of know about them, and you're connecting with them." In other words, when students feel like you are invested in them, they become more invested in you and the projects. That sense of safety allows them to feel comfortable taking risks. Additionally, the more facilitators know their students, the more they are able to pick the right moments to challenge them, while still keeping the work fun and engaging.

Conclusion

Through the university and afterschool program partnership, undergraduate facilitators engaged in practices confirmed as high quality by OST research (NASEM, 2025) and grew in their STEM identities as both teachers and learners. All three of the findings that supported this growth in competence and confidence stemmed from learning within the university-based class. The class supported the undergraduate facilitators in developing their understanding of the STEM content and teaching practices, such as productive failure, the engineering design process, and building strong relationships with students. We see evidence of the benefit of foregrounding the maker mindset along with relationship building, which should be emphasized and supported through professional development for OST facilitators and staff.

University–community partnerships can build the skills of both pre-service teachers and OST mentors

(Bradshaw, 2015; NASEM, 2025). Postsecondary programs that include undergraduate and master's programs in youth development can allow hands-on experiences and multidisciplinary learning opportunities for those entering the education field (Evans et al., 2010). Many OST facilitators lack access to continue their education once they start working, so these partnerships can provide pre- and in-service training (Mahoney et al., 2010). University–community partnerships also create opportunities for pre-service teachers and OST mentors to work together, developing more effective teaching practices (Renick et al., 2021). Although not all afterschool programs have an existing connection to university programs, these same practices and mindsets can be supported through professional development opportunities for afterschool program teachers; alternatively, program directors can reach out to STEM and education departments at their local universities for support in developing STEM content and teaching knowledge (Bradshaw, 2015; NASEM, 2025).

In general, more funding is necessary for providing high-quality professional development for OST professionals. OST researchers have provided frameworks for assessing site needs and developing training, highlighting the necessity of time, expertise, access, resources, and support (Bradshaw, 2015). Ultimately, our research reveals the potential, given this research and teaching focus, to forge new science teacher pathways and strengthen the OST workforce pipeline.

Future Directions

Our study supports previous research that notes the important role that peer recognition plays in supporting STEM identity development (Carlone and Johnson, 2007; Stapleton, 2015; Urrieta, 2007). However, we were surprised to find that elementary-age student recognition of facilitators as "engineers" or "STEM people" did not show up in the data as a factor that supported facilitators' confidence. Future research should examine how students' perceptions of facilitators influence the facilitators' STEM identities and compare this impact to the influence of peer recognition. Another potential future direction is to follow the current cohort of trainees after graduation to see how they report that this experience affected their later competence and confidence as educators, STEM professionals, or OST staff.

We hope this article contributes to ongoing efforts to create meaningful opportunities for afterschool program facilitators to develop their identities as both STEM learners and teachers. By supporting facilitators in this dual identity development, we not only enhance their sense of competence and confidence in STEM, but also strengthen the broader pipeline of future STEM educators and OST workforce. This approach holds particular promise for addressing persistent challenges in recruiting and retaining skilled STEM educators. Ultimately, empowering facilitators in this way can lead to richer, more inclusive STEM learning environments that open the doors for a more diverse generation of students to explore and thrive in STEM fields.

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Revitalizing Education

A Tribal Approach to Engaging Educators and Students Through a Native Summer Learning Program

Suzanne Delap, Celia Stall-Meadows, Ashley Nunley, Cheyenne Burkett, & Cassie Mixon

Promoting educational success is a primary focus for the Choctaw Nation of Oklahoma. Choctaw Nation provides scholarships and programming that support student achievement, yet families with school-age students remain challenged by Oklahoma's limited per capita education funding, ranking in the bottom 10% of U.S. states (U.S. Census Bureau, 2024). Furthermore, the cultural needs of Native students are often insufficiently addressed in traditional education practices and curricula.

Photo above: POSSE students studying horticulture of tanchi (corn). Photo courtesy of POSSE host site.

In response, Choctaw Nation established the Partnership of Summer School Education (POSSE) program in 2013. POSSE is an out-of-school time (OST) summer program for early elementary-aged children attending schools within the reservation's boundaries who demonstrate academic need. A tribally developed education initiative, POSSE provides academic support for students while infusing culturally relevant and sustaining pedagogy and engaging practices for teachers. Following seven

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years of implementation, this exploratory study was designed to gather insights from POSSE educators regarding perceptions of programmatic impact on students, school staff, and classroom practices.

Background

Culturally Sustaining Practices

Culturally sustaining pedagogy requires more than simply responsive or relevant cultural instruction; it sustains the language, literacies, and cultures that students and their community embody (Paris, 2012). Culturally sustaining education relies on the cultural knowledge and experience from students' homes and communities to alleviate social and structural barriers. Essentially, students learn best when making connections to their lived experiences (Harper et al., 2023). By incorporating culturally sustaining pedagogy into the classroom, students experiencing marginalization can receive education equal to that of their peers, and the teachings benefit all students (Parkhouse et al., 2022).

When students receive low-quality instruction in unwelcoming environments, they may suffer from underachievement, which fuels a perception of low academic self-competence (Hunter & Tippeconic, 2020). However, students succeed when they are allowed to participate in curricula that reinforce their language, literacy, and culture (Alim & Paris, 2017). This promotes belonging and connection at school and increases cultural pride and identity. These sentiments result in beneficial outcomes for diverse students, including increased motivation, interest in academic content, and enhanced self-perception of their academic ability, which lays the groundwork for supportive and inclusive teacher–student relationships (Hunter & Tippeconic, 2020).

Culturally relevant professional development for educators leads to increased standardized test scores, improved writing skills, and positive ethnic identity for students, fostering perceptions of respect and appreciation from their teachers (Parkhouse et al., 2022). These relationships are critical foundations of a positive and safe classroom environment that promotes student success (Hunter & Tippeconic, 2020).

Students succeed when they are allowed to participate in curricula that reinforce their language, literacy, and culture.

For educational programs, culturally sustaining pedagogy is reflected in the resources and access to services for learning communities with diverse needs. For example, incorporation of culturally sustaining pedagogy could include specialty programs and coursework, inclusive signage, language instruction, and communication in multiple languages. It may also include review of accountability structures, teacher evaluation and support systems, and professional development practices (Parkhouse et al., 2022).

Local partnerships, such as those between Choctaw Nation and school sites hosting POSSE, are integral to the success of culturally sustaining OST programs. Community organizations partnering with OST programs hold important knowledge about local community values and resources to help programs succeed. These organizations support and sustain OST programs by providing space, funding, materials, and staff training, as well as developing and delivering programming (Levine, 2024).

For this study, the researchers conceptualized culturally sustaining pedagogy in a broad sense, beyond a single focus on American Indian/Native American curricula. Our view encompasses holistic student and educator experiences within the program, both seen and unseen. These experiences include infusion of Choctaw culture and heritage into program materials and resources, along with support from the tribe for teacher training, programmatic leadership, and summer school partnerships with school communities.

Teacher Engagement

Multiple theories exist regarding employee or work engagement (Shuck, Reio, & Rocco, 2011), ranging from human motivational approaches to economic measures of behavior (Pincus, 2023). As a broad term, *work engagement* may be measured in terms of vigor, dedication, and/or absorption in one's job (Minghui et al., 2018) and as the positive and fulfilling state of well-being or attitude about one's work (Bakker et al., 2008). In the education sector, educator engagement has been conceptualized in three dimensions: cognitive, emotional, and social (Klassen et al., 2013). These constructs draw heavily from Kahn's (1990) theory of teacher engagement,

which defines engagement as "the harnessing of organization members' selves to their work roles; in engagement, people employ and express themselves physically, cognitively, and emotionally during role performances" (Kahn, 1990, p. 694).

Employees who are engaged at work feel connected to a larger purpose within their organization and are more likely to commit to that purpose. Applying this principle to the educational setting, teachers who feel connected with their school organization experience deeper commitments to their jobs, schools, and students. Furthermore, resources such as social support from colleagues and supervisors enhance teacher engagement (Hultell & Gustavssen, 2011), thereby leading to increased connection and commitment. Teachers with this sense of commitment demonstrate greater effort and are less likely to leave their jobs, with a significant correlation among teachers' success, their enthusiasm, and positive outcomes for teacher–student relationships (Jackson, 2018).

Increased educator engagement benefits both teachers and students. For example, self-determination theory posits that teacher engagement influences the quality of teacher–student relationships (Wang et al., 2022). Students build positive relationships when teachers make them feel valued by supporting their life situations and respecting their perspectives (Jones & Jones, 2020). This, in turn, significantly affects student motivation, which supports improved academic engagement and behavioral outcomes for students. Conversely, negative teacher–student relationships are associated with students' lack of enjoyment of school, limited cooperation in the classroom, and overall diminished academic readiness (Palermo et al., 2007). The implications for OST programs are that students will have higher investment and improved outcomes when they feel a sense of belonging fostered by a welcoming atmosphere. Therefore, educator engagement is integral to promoting culturally sustaining pedagogy and fostering student success in both the regular and OST classroom settings.

Students build positive relationships when teachers make them feel valued by supporting their life situations and respecting their perspectives.

For this study, researchers conceptualized *teacher engagement* as teachers' self-reported increased enthusiasm for their work. Engagement was also defined as a sense of purpose, meaning that educators perceived that their work in the POSSE program made a difference in both their professional lives and their students' lives.

Program Context

Originally established in a single school district, the POSSE program has expanded to 52 host sites across nearly 11,000 square miles of the Choctaw Nation reservation in southeastern Oklahoma. Internal education data from Choctaw Nation show that the POSSE program has enrolled approximately 38,000 students to date, including 33% who identify as Native American. Since its inception, POSSE has served students in kindergarten (22%), first (24%), second (21%), third (19%), and fourth (6%) grades. Currently, POSSE's programming supports students in grades K–3.

Regardless of race, all early elementary students within Choctaw Nation territory who score below the 40th percentile on nationally normed reading assessments are invited to participate in POSSE. Others are invited based on recommendations by school staff. The average student–teacher ratio is 10.8:1.

Methods

The purpose of this study was to qualitatively explore educator perceptions of POSSE's impact on students, school staff, and classroom practices. Perspectives were sought from principals and teachers during six focus groups. Additional descriptive statistics provide educator demographics.

The study design was approved by the Choctaw Nation Institutional Review Board and conducted by the Choctaw Nation tribal research department and an external Choctaw researcher. Since 2016, the tribal research department, managed by a professional Native American educator, has conducted scientific research for the tribe, allowing tribal leaders to make value-rich and data-driven decisions.

Data collection for the study occurred during the Choctaw Nation Professional Learning Conference (CNPLC) held in Durant, Oklahoma, in May 2022.

To recruit educators for the sample, researchers selected an equal number of smaller and larger POSSE sites from the CNPLC registration list to represent all quadrants of the reservation. Researchers then contacted principals at selected sites via phone to invite them to participate in a focus group. Each principal was also asked to recommend one novice and one veteran POSSE teacher for focus group participation. Principals used their own discretion when categorizing POSSE teachers as novice or veteran. The tribal research manager contacted teachers via email with an invitation to participate. Before each focus group, participants provided informed consent, with documents stored securely by the research department.

Six researchers conducted the focus groups in pairs consisting of one senior researcher and one research assistant. The three senior researchers were Choctaw tribal members, lending cultural sensitivity to the data collection process. Focus groups began with a standardized script read aloud to participants. Research assistants noted information on coding sheets, allowing the research team to cross-reference names and speaking order with recorded voices.

Participants introduced themselves by sharing their first name, total years of teaching experience, and time spent in the summer learning program. On average, novice teachers had 1.1 years of experience teaching in POSSE and 9.2 years of teaching during the regular school year, and veteran teachers averaged 4.7 years in POSSE and 17.5 years in the school year. Principals reported an average of 16 years of teaching experience and 6.5 years in the principal role.

Table 1 contains the questions asked of all focus groups.

Within 24 hours following the focus groups, the three lead and senior researchers documented overall impressions of their focus groups in the form of two-page field notes, which were shared among the researchers as well as with POSSE administrators. For accuracy, the focus group sessions were recorded, transcribed using Descript software, and verified by lead researchers. Following processes described by Braun and Clarke (2006) and Miles and Huberman

Table 1. Focus Group Questions, May 2022

Items	Asked of Principals	Asked of Teachers
What do you see as the most significant change in teachers as a result of POSSE?	X	X
What do you see as the most significant change in students who attended POSSE?	X	X
What are social/emotional needs that could be hindering students in the classroom?	X	X
In what ways does POSSE support social/emotional needs of its students?	X	X
What do you see as the most pressing academic needs of our students?	X	X
What aspect of POSSE has the greatest impact on students' academic achievement?	X	X
What aspect of POSSE has the greatest impact on students' confidence?	X	X
In your opinion, what determines success in the POSSE program?	X	X
How might these successes affect Choctaw children's adult lives?	X	X
What are your perspectives on (thoughts about) integrating the Choctaw culture in the POSSE curriculum?	X	
What suggestions do you have for other POSSE principals?	X	
What suggestions do you have for other POSSE teachers?		X

(1994), inductive thematic analysis was used to identify important descriptive concepts (such as data elements). Researchers initially coded their own sessions; interrater reliability was achieved by reviewing and cross-validating field notes and coding processes via shared files. Emerging concepts were grouped into themes; the relative importance of each theme was determined by content analysis or frequency of occurrences. A natural break in frequency of theme occurrences aided researchers in selecting the top themes (n = 7); these are discussed in the Findings section. A coding example for one of the most frequently occurring themes, *Confidence*, is shown in Table 2.

Focus Group Findings

This section presents each primary theme from the principal and teacher focus groups. The seven themes developed through inter-rater coding were Engaged Students, Engaged Teachers; Inspiration and Motivation; Love of Learning; Providing a Social Safety Net; Giving Voice; Lifetime of Confidence; and Planting Seeds for Future Success.

To visualize each theme from a cultural lens, a graphic using traditional Chahta tanchi (corn) was developed (Figure 1). Tanchi was chosen because it represents a meaningful and cultural food staple used by Choctaw people for centuries.

Engaged Students, Engaged Teachers

POSSE educators experienced autonomy during the summer learning program that was different from that experienced during their traditional academic year. They felt empowered to follow best practices and experiment with teaching methods that met each student at their level. For example, POSSE educators focused on content mastery as opposed to "teaching to a test," such as standardized and high-stakes assessments. This resulted in greater teacher enthusiasm and a positive sense of renewal in their teaching careers.

Many POSSE teachers and principals observed that engagement was a reciprocal process between teachers and students. When children exhibited increased excitement and interest, it led to positive outcomes for teachers, such as increased enthusiasm and a sense of professional renewal.

When children exhibited increased excitement and interest, it led to positive outcomes for teachers, such as increased enthusiasm and a sense of professional renewal.

Figure 1. Tanchi Illustration of POSSE Interview Themes

This reciprocal loop of engagement was noted by both experienced and novice educators across subject areas. A principal in a focus group stated, "If your teacher is excited, guess what? You're going to be excited. The kids really feed off the teachers, a relaxed atmosphere, and their willingness to be there and make it fun."

Inspiration and Motivation

POSSE was a source of both academic and social inspiration for students. During the regular school year, some POSSE students exhibited social–emotional needs manifesting as discipline concerns and social skills challenges. During POSSE, students were given opportunities to practice and model positive friendship skills. Many children found commonalities with peers while viewing themselves in a new, positive light. Teachers and administrators noted that POSSE students were inspired by their successes rather than demotivated by their failures: "[T]he focus level goes way up with those kids … it's just little, small victories that you get to see here and there, but those are huge milestones for a lot of kids," said a veteran teacher.

Having supplemental and culturally relevant resource materials provided by POSSE was seminal for educators. Returning POSSE teachers benefited from themed literacy and mathematics tools, such as free trade books for

Table 2. Identifying *Confidence* Theme by Coding Data Elements

Data Elements	Frequency
Increases student confidence	10
Builds student confidence and sense of pride	10
Builds confidence and sense of pride	9
Confidence (for students)	9
Builds student confidence	4
Small groups help to increase student confidence	4
Less intimidating (for students)	3
Fosters student/teacher confidence	1
Increased self-confidence	1
Large classes during school year decrease student confidence	1
Teachers need to be excited to build student confidence	1

students to use and keep. These resources provided flexibility and creativity in instruction, because teachers were allowed to scale instructional approaches according to their professional strengths and student needs. Further, teachers applied the themed learning to their academic year outside POSSE and viewed POSSE as an ongoing supportive resource. For educators, the toolkits and resources were a source of inspiration for their teaching practices that endured well after the summer school program ended.

Love of Learning

For many students, learning gains in POSSE represented their first experiences with academic success. POSSE's small group settings were often cited as the primary reason for improved student performance, along with teachers having time to return to concepts and to appropriately pace learning for each student. One principal explained this phenomenon in action:

> A lot of students are more excited about coming to school because it's more of a 10:1, 11:1, 12:1 ratio. They get more individualized instruction, and they're more successful. They're not frustrated. That transcends not only through the summer, but they're more excited about coming back to school when school starts.

Educators noted that POSSE students were excited about attending summer school in a way that contrasted with their usual school year experiences. Many teachers and principals reported that they, too, experienced this increased excitement in their approach to POSSE.

Providing a Safety Net

The extended school year was an opportunity to provide wraparound support for POSSE students. When asked to describe challenges faced by students in Choctaw Nation, teachers reported lack of childcare, isolation, poverty, and food insecurity as realities for many families. As a buffer against

these challenges, POSSE provided a consistent and predictable schedule for students, maintained a safe and secure setting during the summer, and helped combat food insecurity by providing free breakfast and lunch to each participating child. These provisions met basic needs and supplied critical foundations for supporting student readiness for learning. POSSE, as an extended OST learning program, ensured that the primary needs of students were consistently met—needs that often derail student capacity for learning. A veteran teacher shared:

> [There are] lots of broken homes and lots of kids coming to school with a lot of trauma in their lives, that these little five- and six-year-old kids have to endure, I mean nightly and during the day, so school's their happy place, it's their safe place. So that's what I like about [POSSE].

Giving Voice

POSSE elevated the voices of educators and their students. POSSE staff were given autonomy and the necessary resources to determine how best to meet their students' needs, and teacher voices were further highlighted during the subsequent focus group process. POSSE students became much more vocal and likely to contribute during summer school classes through increased participation, raising hands to answer questions, and interacting with peers. A veteran teacher observed that POSSE's small group settings allowed teachers to provide individualized attention that empowered student voices:

> You can focus on what each student needs. You can—not that we don't try to do that throughout the year, but it's just easier when you're in a small group. They start talking and you find out so much because once they start talking, they don't stop.

POSSE's small group settings allowed teachers to provide individualized attention that empowered student voices.

For teachers and principals, this led to positive teaching experiences and potential easing of stressful aspects of education, such as navigating disciplinary referrals and behavioral concerns.

Traditional education settings in the U.S. have marginalized Native teachings, leading to a lack of exposure to tribal culture and decreased relevance for Native students. In contrast, POSSE educators noted that the program provides a platform for Choctaw culture and heritage. Through POSSE, students were introduced to Choctaw language and history. Trade books, such as *Chukfi Rabbit's Big Bad Belly Ache* (a Choctaw traditional folktale), were provided free of charge to each student. The books were used during classroom instruction before being sent home with the student for use after summer school. By giving voice to Choctaw language and culture within the learning environment, the program provided a bridge for Native students to learn more about their heritage while also introducing Native teachings to non-Native students.

Lifetime of Confidence

POSSE educators indicated that the program fosters a love of learning that sets the stage for improved academic outcomes in the future. Small group settings, cultural teaching resources, autonomous instructional approaches, and social–emotional learning opportunities worked together to build confidence in POSSE students. Essentially, experiencing academic and social success instilled a belief in students that they *could* succeed. Teachers and principals noted that this belief flowed into increased enthusiasm and engagement at school and with peers, enduring well into the following school year. A veteran teacher shared:

> I think it helps for those kids to build that confidence that normally doesn't get to shine during [the] normal school year when we're in regular class with all the other kids. It gives them the opportunity to shine with summer school and they feel like they're proud, you know, and they're confident, that confidence.

Planting Seeds for Future Success

POSSE teachers noted that the program can have a potential lifelong impact for students. Modeling, broadening student's horizons, and instilling confidence during the early years of development may lead to improved life outcomes for students, such as degree attainment and vocational success. A novice teacher shared thoughts on the importance of modeling positive future outcomes for POSSE students:

> In their adult life, they realize when they do get older, they're not limited to what mom and dad, and grandma or grandpa, have always done. Then they know because they are becoming better readers and more confident, they have options of what they want to do with their life. They're not stuck in the same town or the same place. They can choose to do that if they want to, but it's just a choice now and not a generational curse.

For example, POSSE incorporated field trips into the summer learning program. For instance, students visited a local vocational-technical campus and fire training facility to learn about careers as first responders. They learned fishing skills at a state park on the reservation. Students toured the Choctaw Nation hangar and learned about careers in aviation. The Choctaw Nation recycling center taught lessons in waste management. They toured a grocery store and learned about careers in food distribution. A popular cultural destination was the Choctaw Cultural Center, where students learned social dancing, beading, or cornhusk doll making. Teachers and principals cited these experiential learning opportunities as among the most impactful elements of POSSE. Many noted that students in Choctaw Nation may lack access to models of vocational and academic success, or that they live in isolated communities. POSSE field trips represent ways to expand students' horizons by modeling different vocations and opportunities within their communities.

Teachers and principals were also positively affected by the POSSE program. The autonomy and support provided by POSSE represented a professional renewal, which led to increased enthusiasm as educators reinvested in their careers.

Discussion

Given POSSE's unique opportunity to reach tribal and nontribal children early and effectively, the implications of influencing future growth and success in Indian country are profound. The focus group findings highlight how providing support, building confidence, and empowerment can increase engagement and investment for both teachers and their students in OST settings.

Professional Implications for Educators

Educators often cited small group settings and autonomous teaching opportunities as seminal components of the POSSE program. Teachers could reinvest in their careers by engaging in their preferred teaching modalities while providing individualized instruction. Students also benefited from an increased love of learning and confidence in their academic and social skills. This led to deeper engagement, paving the way for improved academic and social outcomes for POSSE children.

Academic/Social Emotional Loop

The POSSE program provides academic support for students struggling to meet grade- and age-based benchmarks. Educators have noted the links between poor academic performance and behavioral and social skills challenges. At first glance, the POSSE program appears to center solely on academic skills. However, the interconnection between academic and social–emotional development is clear. By providing students with small group settings that encourage success and allowing teachers to dedicate time to individualized instruction, POSSE models a supportive classroom environment fostering social skills development, leading to decreased discipline referrals and improved peer interactions.

POSSE models a supportive classroom environment fostering social skills development.

POSSE demonstrates the importance of early academic and social intervention, coupled with addressing unique needs and realities of children living in Choctaw Nation. Food insecurity, lack of access to childcare, and isolation were cited as concerns. Providing a form of wraparound services in summer, POSSE represents a bridge between ensuring wellness and encouraging academic gains for children.

OST summer learning programs offer opportunities to fill gaps between academic and social outcomes. Safety, social–emotional wellness, and enrichment form building blocks of health and well-being for students facing significant challenges in their home lives. Considering that many students, both Native and non-Native, on tribal lands can benefit from access to social support, programs like POSSE represent pathways to supporting these children in numerous ways.

Culturally Sustaining Approach and Implications

Intervening early in a student's academic life and incorporating relevant culture are important pathways to improving academic success and promoting inclusion. Native students may feel disenfranchised in educational settings. To address this, POSSE incorporates Choctaw language and celebrates Choctaw customs to create a welcoming environment. This inclusion has immediate academic and social impacts, promoting a culturally sustaining approach by engaging both Choctaw and non-Native youth during a critical learning period.

As a valued link in the chain of cradle-to-career initiatives, POSSE's extended summer learning plays a crucial role for vulnerable children in Choctaw Nation. POSSE students were given access to experiential learning opportunities such as guest speakers and field trips, modeling positive vocational and life outcomes. By allowing children to think outside their daily experience, POSSE exists as an incubator for future success and allows children to envision what could be, rather than simply what is.

The findings from this research demonstrate the unique potential for Native nation building in OST education. Developed by Choctaw Nation, POSSE's goals are twofold: to address the specific learning needs of children in Choctaw Nation through summer recovery education, and to suffuse curricula with Choctaw language and culture. Students are introduced to basic Choctaw vocabulary and have access to culture and heritage, which enhances academic and social relevance for Native students in POSSE and introduces these topics to non-Native students. It is important that Native students feel represented in their curriculum and school settings. For non-Native students, exposure to Native culture is the first of many steps to combat the marginalization and "othering" of Native peoples, with the ultimate goal of improving representation across multiple academic and social settings.

Recommendations for Practice

Encouraging academic success in a culturally rich setting is an important goal for OST programs like POSSE. Similar to POSSE students, many Native youths attend school in public education systems. For communities located within or near tribal boundaries, programs like POSSE present pathways to encourage and support improved academic outcomes and to provide culturally sustaining instruction in a partnership model between tribes and local school agencies. Specifically, the partnership between the Choctaw Nation and its 52 public school host sites highlights the benefits of collaborating with external organizations to create and sustain OST programming. For example, in the POSSE program, Choctaw Nation coordinates logistics, funding, and materials, and develops culturally grounded programming. As an external partner, the public school system provides access to a skilled educator workforce and significant infrastructure that bolsters OST program delivery.

Next, the POSSE program recruits public school educators to engage in learning that focuses on formative and student-paced processes, rather than "teaching to a test" or state standards. Educators in this study highlighted the benefit of a model that revitalizes teacher and student engagement and success. Teachers and principals shared their increased enthusiasm and sense of renewal and remarked on students' improved behavioral, academic, and personal growth. The processes developed by POSSE demonstrate the reciprocal, positive loop between teacher and student engagement. Essentially, OST programs can reap twofold benefits of improved student outcomes and positive workforce engagement through a liberating and culturally sustaining approach.

The processes developed by POSSE demonstrate the reciprocal, positive loop between teacher and student engagement.

However, a general lack of awareness of Native teachings, lack of workforce capacity, and logistical and cost challenges are barriers to implementation of culturally sustaining programming for Native students. For programs that serve Native students but are not in proximity to Native lands, forging relationships and increasing awareness of Native identities and practices are the building blocks of promoting student engagement and improved outcomes. As a next step, non-tribal OST programs may consider merging Native teachings (such as traditional folktales and experiential learning) into curricula. Consulting with elders in tribal communities and inviting feedback from Native families are additional ways to begin the journey from cultural sensitivity to culturally

sustaining educational practices, building bridges that ensure academic success for all Native youth.

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YPAR as Process

Supporting Youth Development Through Youth Participatory Action Research

Sally Neas, Steven Worker, Car Mun Kok, & Dorina Espinoza

As a new Latina immigrant to the United States, Julia remembered feeling devalued and marginalized because she did not speak English: "People … tell you that you are less for not knowing how to speak the language, because this is a country where only that [English] language is spoken." Julia then enrolled in a Spanish-facilitated youth participatory action research (YPAR) program, in which she and her peers designed and analyzed a survey on how other immigrant students had learned English.

Through analyzing data, she discovered that many others shared her struggle. Doing so reframed her understanding of her experience: "I have more confidence in myself, and I can share things in some other classes. And I dare speak English without fear and share my ideas," she noted. Julia's journey shows that when the topic of a YPAR project centers young people's lived experience, it can be deeply transformative.

In YPAR, young people develop and implement research and action projects (Cammarota and Fine, 2008). YPAR is often used to support youth-generated

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knowledge and action, but it is also recognized for its value in youth development. In particular, YPAR supports youth in developing critical consciousness, which is the process of critically reflecting, developing motivation, and taking action to change injustices (Cammarota and Fine, 2008). Research has documented that YPAR supports the development of critical consciousness, but there is less understanding of the mechanisms by which it does so.

We explore the programmatic components by which YPAR supports the development of critical consciousness and, thus, youth development more broadly. To do this, we implemented YPAR with four cohorts of middle and high school youth in Northern California. Using data generated from youth focus groups and educator interviews, we explore how the youth's topic selection—in particular, having an open topic selection, as opposed to one that is constrained by the adult facilitators—was pivotal in affording the opportunity to develop critical consciousness. First, we discuss relevant literature, program implementation, and our methodology. We then explore our findings, including a discussion of the practical implications for the use of YPAR as a tool for youth development.

Youth Participatory Action Research as a Developmental Pathway

Positive Youth Development, Youth Empowerment, and Critical Consciousness

Positive youth development (PYD) is a field of research and practice that examines the inputs that lead to positive outcomes for youth by taking an asset-based approach, placing young people and their context at the fore (Arnold, 2018; Lerner et al., 2011). The long-term goals of PYD programs are to help young people develop positive norms, skills, and attitudes to successfully negotiate a transition into adulthood (Arnold, 2018). PYD frameworks and approaches predict that when youth are engaged in high-quality programs, they will experience better outcomes and fewer adverse health or risk-taking behaviors (Arnold, 2018; Lerner et al., 2011).

In the literature on youth development, the role of empowerment is central. However, youth empowerment is often poorly defined, lacking conceptual clarity and using a multitude of definitions (Úcar Martínez et al., 2017). One more radical conception of empowerment comes from Brazilian educator Paulo Freire, who developed the concept of *critical consciousness* (Freire, 2018; Úcar Martínez et al., 2017). Critical consciousness involves an oppressed group coming to critically analyze and seeking to change social injustices. It involves three domains: (1) critically reflecting on social injustices; (2) gaining critical motivation to change the injustices; and (3) taking action to address them (Christens et al., 2016; Freire, 2018; Watts et al., 2011).

Youth have been shown to benefit from developing critical consciousness. For example, critical consciousness can address feelings of powerlessness and internalized oppression by providing a means to challenge the dominant culture (Ginwright & Cammarota, 2002; Ginwright & James, 2003; Watts et al., 2011). Among these youth, it can also build resilience (Ginwright, 2010). For people of color, engaging in community action to address inequities may help such communities cope with the hardship of structural oppression (Hope & Spencer, 2017).

Youth Participatory Action Research

YPAR emerged as a youth-centered extension of participatory action research (PAR). PAR was developed, primarily by scholars of color, as a way to co-create knowledge with communities, who then co-own and leverage that knowledge for change (Ayala et al., 2008; Cammarota and Fine, 2008). YPAR was developed with the same goals and perspectives applied to youth contexts, emerging from critical youth studies, to provide "young people with opportunities to study social problems affecting their lives and then determine actions to rectify these problems" (Cammarota and Fine, 2008, p. 2). The topic of YPAR projects may be constrained or predetermined by adult facilitators, as discussed by Luguetti et al. (2024) and Anderson et al. (2021), or could be open, unconstrained, and determined by youth.

Critical consciousness can address feelings of powerlessness and internalized oppression by providing a means to challenge the dominant culture.

Although it was initially conceived as a tool for youth-generated knowledge and change, YPAR has also proven beneficial for youth development, especially for promoting empowerment and critical consciousness (Anyon et al., 2018). YPAR has been shown effective in building relational empowerment among youth (Langhout et al., 2014) and positioning youth as experts in understanding and changing their own experience (Bertrand, 2018; Ozer & Wright, 2012; Scorza et al., 2017; Villa et al., 2018). YPAR also supports youth in developing agency and envisioning change (Bertrand et al., 2017; Scott et al., 2015). Anderson et al. (2021) examined the process of developing critical consciousness in YPAR more closely. They found that at the beginning of the program, youth tended toward individual, as opposed to systemic, analyses of injustice. However, through the YPAR process, they were able to place their individual-level attributions of injustices alongside dialogue about structural inequities and thus develop a more systemic level of analysis.

Although YPAR supports the development of critical consciousness, there is little research on the mechanisms by which this happens. Anderson et al. (2021) examined the pedagogical practices that support critical consciousness; however, in general, there is a lack of attention to implementation of YPAR (Leman et al., 2024). Our research addressed this gap by exploring how youth developed critical consciousness and the mechanisms of YPAR that afforded this in a multi-site, multi-year YPAR project.

Program Implementation and Context

Data from this project were generated through a YPAR study we conducted over three years at four school sites. Most programs were offered after school, although two took place during school hours. Both in-school sessions and afterschool programs were facilitated by an outside educator, using the same curriculum, and with an emphasis on youth development (as opposed to typical classroom pedagogies). The program was led by the University of California 4-H youth development program; the specific sites are listed in Table 1. Groups were facilitated in English except for site A, which was facilitated in Spanish. Educators were trained in the *Community Futures, Community Lore* curriculum (Erbstein et al., 2021), which outlines nine *stepping stones* (program phases) that guided the youth and adult educators in their YPAR projects (see Figure 1). Programs were implemented on a weekly basis during the school year for 60 to 90 minutes each, with each session including at least one stepping stone activity.

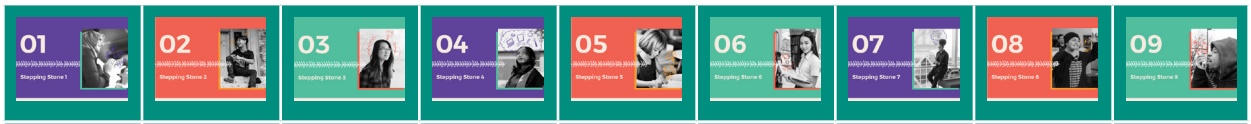
Exploratory Research Methods

Our research was exploratory and qualitative, starting with the viewpoint that knowledge is created through social interaction and shared meaning, rather than existing as an objective truth that can be measured independently of people and context (Creswell & Poth, 2018). We employed semi-structured educator interviews and youth focus group interviews to solicit adolescent meanings and experiences (Krueger & Casey, 2014; Seidman, 2013). We analyzed interview transcripts using thematic analyses (Braun & Clarke, 2006, 2022; Braun et al., 2019).

Data Collection

The research team conducted individual educator interviews and youth focus group interviews at the end of each program year. Interviews were conducted in English, except those at site A, Year 1, which were conducted in Spanish and then translated into English. Youth focus groups were formed randomly as subsets of youth from each site. We used semi-

Figure 1. *Community Futures, Community Lore* Curriculum Stepping Stones



Get Ready for Your Project	Get to Know Your Project & Team	Choose a Focus: What Do You Want to Change?	Develop Your Research Plan	Practice Research Skills	Conduct Research	Analyze Your Data	Create & Share Final Product	Take Action

Table 1. YPAR Sites, Participants, and Youth-Identified Research Topics

During School or After School	Number of Sessions (Minutes per Session)	Educator(s)	Youth
Site A: Public high school with a high Latinx population. In year 1, the program took place during an English learning class within the school day; in year 2, the program was offered after school. Youth participants in both cohorts were Latinx English language learners.			
Year 1: During	23 (75 min)	1 Latino male	16 (16 Latinx; 6 female/10 male)
Year 2: After	8 (75 min)	2 Latino males	10 (10 Latinx; 4 female/6 male)
Site B: Public K–8 school with half of the youth from lower socioeconomic status families. Youth identified as Latinx and participated during after-school hours in both years 1 and 2.			
Year 1: After	11 (90 min)	Latina female (first author)	4 (4 Latinx; 4 male)
Year 2: After	12 (60 min)	Latina female	7 (5 Latinx, 2 African American; 5 female/2 male)
Site C: Public high school with a majority White student body (less than 10% and 1% of youth identified as Latinx or Black, respectively). The program was offered during the school day.			
Year 2: During	13 (60 min)	Latina female	11 (5 Latinx, 2 African American, 4 non-identified; 6 female/5 male)
Site D: Continuation high school, with a lower-than-county average graduation rate. The program was offered as an afterschool activity.			
Year 2: After	12 (60 min)	2 Latino males	8 (5 Latinx, 1 African American, 2 White; 5 female/3 male)

structured interviews with 16 educator questions and ten youth questions. The interviews and focus groups were recorded and transcribed. We conducted six educator interviews and 15 youth focus groups in the two years reported here. This project was approved by the University of California's Institutional Review Board. All names have been changed to pseudonyms to protect participants' anonymity.

Data Analyses

Our inquiry was grounded in thematic analysis, a flexible analytical method for constructing themes in qualitative data (Braun & Clarke, 2006, 2022). We analyzed transcripts collaboratively, through a consensus-based process designed to emphasize diverse perspectives. All the authors coded the 2019 educator and youth transcripts and developed codes independently and then came together to discuss and agree upon an initial code set. We applied these codes to all data, with one team member serving as the primary coder and the other members serving as reviewers. Discussions followed to reach inter-coder agreement (Cornish et al., 2014).

Links among Lived Experiences, Topic Selection, and Critical Consciousness

We discovered a tight intertwining of young people's lived experiences, their selection of a topic for their YPAR projects, and their development of critical consciousness. Youth cohorts selected topics and defined research questions that were directly related to their lived experiences. Then, through the research phase of the project, they systematically investigated this issue, enabling them to reflect on

their own experiences. When time allowed, cohorts then used this new knowledge to generate action projects. Our findings indicated that, during YPAR, a primary mechanism for youth to develop critical consciousness was having the ability to identify the topic of their YPAR project, as opposed to a topic that was constricted by adults.

Lived Experience and Topic Selection

After forming as a group, the youth participants' first task was to select a topic for their YPAR projects. There were few, if any, constraints on their topic selection; youth were encouraged to select any social issue they found salient and interesting (see Table 2). This autonomy was difficult for many youth, as Isabella at site A said: "Sharing the ideas, I think, was the most difficult, because you feel that other people are going to make fun of what you say." This sentiment was expressed by many youth across sites. The educators worked with the youth, using the curriculum and their own personal experiences, to help them find their voices. One educator, Derek, responded when asked how involved they were in topic selection, "It was 100 percent them [youth]. I was really just trying to see what they cared about."

Although an open topic selection was challenging, the interview data revealed that it was rewarding; many youth identified choosing their topic as the most interesting part of the project. For example, at site A, where the topic was methods for learning English, Allan said, "The interesting thing about the project was that there are many methods to learn English." Similarly, at site B, Cassie said, "[The project] is not for school, so we do have a little more freedom to choose a topic that we want to talk about, that maybe the school wouldn't have allowed us to talk about."

The crux of the issue was not just that the topic was "interesting" or that participants valued the "freedom," but rather that, with this freedom, participants were able to define a YPAR project that was directly related to their lived experiences. In all instances, their topics—methods for English language learning, cafeteria food, or racism in their school or wider community—reflected aspects of young people's lives where they experienced marginalization and were struggling for agency (see Table 2).

For example, at site A, all the youth were English language learners. Their topic was experiences and methods of learning English. They wanted to know how other English language learners had acquired

Table 2. Summary of Research Topics, Methods, and Action by Site

Site	Topic	Research and Action
Site A	English language learning: Youth identified inadequacy of formal language learning instruction and investigated what worked best.	Created survey for peers to understand how they best learned English Created afterschool learning space for them to practice English
Site B	School food: Youth wanted to get rid of "fake food" at the school and bring in fresh options.	Developed peer survey about opinions on school food Interviewed school personnel to learn how to improve food options
Site C	Ethnic studies: How to implement an ethnic studies class at school.	Initial topic was homelessness, but changed after youth experienced racism from White teacher Examined syllabi from other courses and talked with administrators about incorporating ethnic studies classes
Site D	Racial bias: What causes people to act with racial bias and how to address those issues.	Developed interview protocol to ask peers and adults about their experiences of racism

the language, which they investigated through surveys with their peers. Their focus on English language learning reflects a daily struggle in their lives. This is clear in Mateo's comment, where he describes his experience of not speaking English: "[S]ometimes you are afraid to pronounce things and that's the problem, that you know what you are going to say, you can defend yourself, but at the same time it gives you as a type of anxiety when talking." This sentiment resonated with other youth.

The saliency of the topic was also reflected in interviews with youth at site B. These youth, all of whom were low income, chose to address their selection of food at the school cafeteria. Food is an inherently personal topic, but for low-income youth, it is also a place of further marginalization. During the project, these youth came to call the cafeteria food "fake food"; in the interview, Eli elaborated: "Because we get served like really cheap, nasty food (school cafeteria food) that isn't even like food and we want like actual food." Eli's complaint about the school's food was more than simple dislike. Despite finding it "cheap and nasty," all the youth in the project were eating cafeteria food anyway. As low-income youth, they did not have the opportunity to bring food from home as wealthier youth could. They also had limited food choices at home. One youth, Emiliano, commented that they would use what they learned in this project "[a]t my house because we get the same food as the school does. I'm pretty sure the school gets stuff from the food bank, and I get it from there." Another exchange revealed that several of the youth access food through WIC, a federal nutrition program. WIC provides important access to food, but it also severely limits the food choice, as those using it can purchase only pre-approved items with the benefit. Thus, in selecting cafeteria food as their topic, youth at Site B were creating an opportunity to influence something that deeply affected their daily life, yet they had limited agency over it.

Youth at sites C and D both chose to address racism, albeit through different lenses. At site C (all youth of color in a predominantly White school), participants had originally chosen to address homelessness through their YPAR project and were making headway in doing so. Then, during a field trip, one of the participating youth experienced racism from a White teacher. The group then decided to change their topic to researching and developing an ethnic studies class at their school. The educator at this site described the change as follows:

> They went [on a field trip] and had this horrible experience. And they were like—why is it that nobody knows who we really are? And one of the high schools that they went to visit actually had an Ethnic Studies class and they were like, "Why don't we have that?" … And they were like, "Alright, we want an Ethnic Studies class."

In this case, youth expressed to the educator a sense that "nobody knows who we are." As youth of color in a predominantly White school, these young people experienced erasure and misunderstanding of their identity at school. They then sought to change that by creating education that reflected their needs.

Youth at site D centered their YPAR project on understanding racial bias in their wider community. The cohort of youth were mostly Latinx, living in a predominantly White town. With the support of educators, they crafted the following question: "How do people in our community experience and express racial bias?" As youth of color, these youth had faced such bias. As Maria said, "We all face similar struggles and that bias can affect us all and we have to know we have biases too." Thus, with the autonomy to identify their YPAR topic, these youth also defined one that related to their lived experiences.

Youth expressed to the educator a sense that "nobody knows who we are."

Selecting a topic was the most challenging aspect of the project for many youth—and it was also pivotal for many. Given an open choice of topics, all groups selected a topic that was connected to their daily lived experiences—as youth who do not speak English, as youth who were low income and have limited choice over their food selection, and as youth who experienced racism in their schools and community. This is not to say that an open topic *inherently* will lead youth to choose one that is connected to lived experience (although we believe, based on this research, that that is likely), but rather that it *allows for* that opportunity—and, in these projects, that proved beneficial.

Youth Afforded Opportunities for Critical Consciousness

We found evidence that many youth engaged in the various domains of critical consciousness: critical reflection, critical motivation, and critical action (although not all youth and sites engaged in these domains evenly), and that doing so was connected to the open topic selection. Having the autonomy to define their own topic afforded these youth the opportunity to identify a topic closely connected to their everyday lived experiences; then, as they moved through the YPAR process, they reflected critically, developed motivation, and, in some cases, took action on their issue, and thus their lived experience.

We found the strongest evidence for critical reflection. For example, many youth from site A, who were English language learners investigating methods of language acquisition, commented that a key lesson from this project is that people learn English through different methods, without a "right" way of doing it. For instance, when asked what he learned from this project, Barrett said:

> That English is very difficult. That it is not very easy to speak, since what we have learned are the ... methods of learning English. ... Because there are people who—not all people use the same method, there are people who learn differently.

These youth had previously expressed that not knowing English created "anxiety" and a sense of insecurity. By gathering other people's experiences, they came to understand that their difficulty with English was not their personal problem or failing, but, rather, unresponsive methods of teaching. Or, as Barrett said, "not all people use the same method; there are people who learn differently."

A similar process was observed at the other sites. For example, at site D, where youth were examining racial bias, Maria said, "Racial profiling was so prevalent, and I didn't think my peers would have faced it. It was hard to learn that they did and how it affected them."

Through the YPAR research phase, youth were able to connect their experiences of oppression in conversation with their peers. Similar to the process described by both Anderson et al. (2021) and Bloomer and Brown (2024), this enabled youth to move from individual-level attribution, thinking that the problems they faced were theirs alone, to a systemic-level attribution, understanding that their experiences of oppression are not individual failings, but rather faced by many and shaped by societal factors beyond their control. This process of critically reflecting on their own experiences is described by Damian at site B. When asked what he learned from the project, he said:

> Well, I think teaching other people the same way we did, to analyze society; and I think that people would be a little less selfish if we would tell them as: "Think of that problem that you have; another person also has it." That is, the program helped us analyze the problems of society.

There is also ample evidence that many youth began to develop critical motivation to create change. When asked what he learned from the project, Fabian at site B said, "I learned that you can change school things." Similarly, Maria at site D described the project as "an educational program where we talk about how the issues affect us at various levels, like the school board vs. a teacher vs. our points of view and it's important to see how we can make change." And Sadie at site C described the YPAR project as "a good way to get together with your friends or make a group with people who have the same interests and make a change, definitely, like anything, your community or what surrounds you." These youth expressed a sense that they can make societal change. In their comments, the youth emphasized the connection between this novel motivation and the proximity of their topic to their own lived experiences. Sadie said it is to "make change [with] your community or what surrounds you."

Many youth began to develop critical motivation to create change.

There is evidence for critical action, although not at all sites. Youth at site A were able to move to the action phase of YPAR. Leveraging their newfound knowledge, they created an afterschool club in which they could practice English in a non-pressured setting, using popular media. Because their experiences of oppression came not only from lacking English fluency but also from the unresponsive pedagogy of their classroom, their move to create an afterschool club that better suited their needs reflects action to change an oppressive situation.

Unfortunately, the other sites were not able to finish developing and implementing their community action projects, in part because implementation took longer than expected (see discussion that follows), and in part because of interruption by the 2020 pandemic. Nevertheless, youth at all other sites were in the process of planning their projects and, given the three additional months they had planned for, likely would have enacted them. Youth at site B, who were examining the reasons for their cafeteria's "fake food," were working with their school staff to introduce fresher and more culturally relevant food options. Youth at site C were developing a proposal for an ethnic studies class and youth at site D were considering opportunities to share their findings. Because all the issues addressed through the YPAR projects were proximal to the youths' lived experiences, the subsequent action projects thus represent changes that would address the structural inequities in their lives.

Even though not all critical consciousness domains were observed at all sites, nor did our research assess whether all youth experienced critical consciousness, our results nevertheless support the conclusion that YPAR created a context in which youth could develop critical consciousness, and that having an open topic selection was central to doing so. When given the freedom to select a topic, these youth were able to define a project that was closely connected to their lived experiences; then, during the YPAR process, and especially the research phase, they were able to critically reflect on their own experiences in the context of their peers' experiences, moving from an individual-level to a systemic-level attribution. This, in turn, helped them develop critical motivation, the sense that they could create change, and, when time allowed, critical action.

YPAR created a context in which youth could develop critical consciousness.

Balancing Topic Autonomy and Project Completion

Through this project, we expanded knowledge about programmatic elements of YPAR that support critical consciousness development. We found that, among these sites, giving youth the freedom to define the topic of their YPAR projects was pivotal in affording them the opportunity to develop critical consciousness, although not all sites or all youth engaged with all domains of critical consciousness. For the youth who did, there was a tight interweaving of young people's selection of their YPAR topic, their lived experiences, and their development of critical consciousness. Given the autonomy of an open topic selection, cohorts selected topics that were connected to their daily lived experiences of oppression. Then, through the YPAR process, they could systematically examine—and, in some instances, change—their conditions of oppression, which led to the development of critical consciousness.

We found the most evidence for youth engaging in critical reflection, which is particularly beneficial for youth development. For the youth in this project, the critical reflection came largely through the research phase, when they discussed their own experiences of oppression in conversation with their peers. Youth in these projects were able to do so because they had the autonomy to define their own topic. However, this was a lengthy and difficult process, and ultimately impinged on their ability to complete the entire YPAR project within the timeline of the program. Although the pandemic shutdown was a key reason that many sites could not finish, the program also took longer than we had initially allotted; we envisioned the program being one semester long, but it would have likely taken a full school year for successful completion. This was due in part to the amount of time spent selecting a topic.

Our findings thus suggest that when program duration is limited, educators may face a trade-off: They may confine topic choices to keep the project moving and improve the likelihood that youth will reach the action phase, or they can leave the topic selection open, creating a rich opportunity for critical reflection, but at the expense of not enough time to fully complete the action phase. Balance is key but is difficult to achieve in time-limited programming. This finding is similar to what Zeller-Berkman et al. (2015) and Stacy et al. (2018) found: When engaging in participatory research or evaluation with youth, constraining the autonomy of youth helps with timeliness, but limits youth voice. Programs with sufficient time can achieve both aims. However, a year-long program can be difficult to implement and

many educators may face a choice between depth of participation and project completion.

Our findings have implications for both YPAR theory and practice. YPAR can be thought of as a *product* or a *process* (or both). Historically, YPAR emerged as an approach for producing youth-generated knowledge and action, thus emphasizing the *products* or outcomes of YPAR. These products are significant for their epistemological contributions and likely support youth engaging with critical action. In our study, however, we came to see YPAR as a *journey*, as it was engagement with the *process* that afforded youth the greatest development gains. The time that youth spent debating possible topics, selecting an issue, and then conducting research on that issue fostered deep critical reflection. Deemphasizing the final product and foregrounding the investigative journey may thus enhance the opportunity for youth development.

As with all research, ours contains limitations. We drew on a relatively small sample size and our qualitative methodology, though allowing for an open exploration of youth-determined outcomes, did not allow us to investigate how evenly outcomes were experienced by all youth. In addition, youth programming is complex and influenced by many factors; thus, there are likely other aspects that shaped critical consciousness development. Furthermore, we acknowledge that the connection between an open topic selection, lived experience, and the development of critical consciousness is not the *only* way for youth to develop critical consciousness in a YPAR project, but rather is *one possible* pathway. Thus, our research findings are not definitive, should be generalized cautiously, and rather highlight a pattern that was found in these cases.

Implications for Practitioners

Our work suggests that developmental gains ensue when young people are given autonomy and time to determine their own YPAR project topic. This finding has direct implications for practitioners. Educators who launch YPAR projects should first clarify their primary goals and make them explicit to the youth involved in the project. If the intent is to co-produce research findings or actions, YPAR may function more as a product, likely requiring more adult guidance and tighter topic boundaries. Such expectations should be communicated during recruitment and the earliest sessions. When the objective is youth development, however, adults should consider foregrounding YPAR as a process. This means allowing participants ample time, mentorship, and emotional safety to identify issues that resonate personally and collectively. Doing so may lengthen implementation and feel daunting for youth, yet it can enable deeper critical reflection. To ease this phase, facilitators can provide structured support, such as guided brainstorming protocols, reflective journaling prompts, and peer-feedback circles.

To support youth in identifying a meaningful topic, we suggest using structured activities that combine reflection and discussion with concrete planning. For example, in the *Community Futures, Community Lore* curriculum (Erbstein et al., 2021), the "Real versus Ideal" activity asks groups to describe their current school or community on one chart and their ideal version on another, then analyze gaps, underlying causes, and decision-making power. The activity "Choosing a Topic for Change" draws on notes from the previous activity: Youth sort issues, barriers, allies, and steps toward the ideal on a four-column chart, then debate feasibility and set initial goals. Together, these exercises give youth voice in topic selection while providing educators clear points for guidance and scaffolding. In addition, Kohfeldt and Langhout's (2012) "Five Whys" activity may also be helpful.

Educators who launch YPAR projects should first clarify their primary goals and make them explicit to the youth involved in the project.

Developmental gains in YPAR can arise when young people have the autonomy to define a research topic that resonates with their lived experience, even if doing so lengthens the project or inhibits completion. Offering autonomy is one pathway to foster critical consciousness in YPAR projects. Educators can safeguard this autonomy while still offering structure through scaffolded activities such as the activities above. As calls to scale up YPAR continue (Anyon et al., 2018), we hope that practitioners will prioritize the process of inquiry, providing intentional supports that help youth surface and analyze their experiences of marginalization. By centering youth voices in this way, YPAR can fulfill its promise as both a rigorous research approach and a transformative pathway to empowerment.

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NEW FROM NIOST

Taking Literacy Skill Building to Scale in OST Programs

A Three-Tiered Approach from the Philadelphia Out-of-School Time Literacy and Quality Improvement Initiative

Patricia McGuinness-Carmichael, Karen B. O'Neill, & Kathryn A. Wheeler

Research indicates that out-of-school time (OST) programs have the capacity to support literacy skill development and can provide a comfortable environment where youth can build excitement about literacy (Afterschool Alliance, 2015). Providing literacy-rich environments outside the school classroom where children can practice and enhance their literacy skills has been a priority for the City of Philadelphia and the William Penn Foundation.

From 2019 through 2023, with generous funding from the William Penn Foundation, the National Institute on Out-of-School Time (NIOST) implemented a model of training and support for OST professionals that focused on developing literacy-rich OST environments through training, coaching, and ongoing support in a community of practice (CoP). This article provides an overview of an effective intervention model using a combination of well-practiced professional development strategies that assisted staff to successfully incorporate light-touch literacy[1] practices in their everyday OST program activities.

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1 *Light-touch literacy* refers to "a way to promote a love of reading among children through practices such as read-aloud, literacy-rich environments, and independent reading" (City of Philadelphia Office of Children and Families, 2020).

Research consistently demonstrates a strong connection between professional development in OST and the benefits experienced by program participants (Bowie & Bronte-Tinkew, 2006; Garst et al., 2014; Palmer et al., 2009). OST staff, however, have limited time, resources, and opportunities to participate in regular workshops, training, or courses. Organizations also face challenges with investing in ongoing staff training because of financial limitations, time restrictions, and high turnover. In addition, staff often fail to apply new information from training as the result of a lack of support from colleagues, insufficient time and accountability to implement what they have learned, and the absence of follow-up support (Buher-Kane, et al., 2006). Therefore, to be effective, professional development approaches must consider the specific challenges faced by OST programs and identify realistic and sustainable strategies for supporting ongoing learning in the field. OST educators have long advocated for professional development that includes immediately applicable activities, relevant resources, and content knowledge expansion (Clark et al., 2021).

Model Building

With this understanding of the field in mind, NIOST researchers and coaches implemented a learning model (see Figure 1) combining asynchronous video training, individualized program coaching, and CoPs with ten OST programs in Philadelphia with the goal to enhance staff ability to integrate literacy practices into daily activities for children in kindergarten through third grade. The project team included an expert literacy coach (content expert) who developed training videos and provided related literacy skill-building resources. The model was designed to meet the need for convenient and content-focused training, opportunities for ongoing targeted support, putting strategies into immediate practice, and the chance to learn with peers through shared experiences. Staff participation in video training, coaching, and CoP meetings varied by program, but generally included program directors, site directors, OST coordinators, lead teachers, and group activity leaders.

Video Trainings

The rise of microlearning and online or virtual training options has introduced new opportunities to overcome time and schedule constraints for professional development. Microlearning, as described by Nieves for Edutopia (2021), consists of "bite-sized" training opportunities that participants can access at their own pace, at times and locations convenient to them. By mitigating challenges such as time constraints and accessibility, these novel modes of instruction align with the readiness of OST staff to use online or hybrid methods, particularly video-based training (Clark et al., 2021).

Figure 1. NIOST Model for Literacy Skill-Building in OST Programs

Video Training	Individualized Coaching	Community of Practice
•Five 15-to-20-minute training videos focused on a specific theory and practice released each month.	•Ongoing 1:1 coaching to support programs.	•Monthly virtual meetings for programs to reflect, learn, plan, obtain resources, and support each other.

Each month, the literacy coach designed and recorded a 15-to-20-minute training video, focusing on a specific light-touch literacy practice. NIOST administered these videos through an online learning management system, allowing completion tracking and making the videos accessible anytime. Participants in some programs watched the videos together as a group; others viewed them individually at their convenience. The videos often featured a role model demonstrating the strategy with children, such as conducting an interactive read-aloud. The practices highlighted in the videos were designed to be implemented immediately by staff. This model allowed program leaders and staff to view the training at their convenience and share the videos widely, even as new staff members onboarded throughout the year. Program participants were asked to try each month's strategy but ultimately focus on the techniques that worked for them and could be sustained within their daily program practices. Each video was accompanied by resource documents and reflection questions to support program implementation planning.

Individualized Coaching

Like other organizations, OST programs must adapt professional development content to their unique setting and ensure that it reaches all staff, particularly those working directly with youth. The transfer of

knowledge from program leaders to site coordinators, staff, and volunteers requires considerable buy-in, capacity building, and ongoing effort at the site level. Previous research suggests that individualized coaching is one of the most effective ways to support OST program staff and improve program quality (O'Connor et al., 2020). Coaching fosters trust and creates space for reflection, ultimately allowing staff to build self-efficacy (Costa & Garmston, 2003). By overcoming the challenge of sustained professional development, coaching helps transform novel learning into improved practice (Kraft et al., 2018).

NIOST coaches made an initial visit to each program site to understand its structure, staffing, physical space, history, mission, and program practices. Using a literacy skill-building inventory, coaches assessed the specific literacy skill-building practices already in place at each program. Each program received monthly coaching sessions focused on literacy skill-building approaches and practices tailored to their specific needs. Some programs kept a focus on light-touch literacy fundamentals; other programs explored ways to incorporate literacy into other program areas, such as physical activities or transitions.

Follow-up coaching calls were structured around the monthly topic introduced in the training videos, giving programs the support needed to implement new practices when ready. Feedback through coaching calls was also instrumental in helping coaches determine the comparative effectiveness of different strategies and change direction when warranted.

Communities of Practice

OST programs often have staff with a wide range of experience, knowledge, and skills. CoPs offer a valuable opportunity for OST staff to learn together—leveraging these diverse experiences and knowledge to focus on shared goals (Wiedow, 2018). Recent research has found CoPs to be an effective method for building capacity in OST programs (NIOST, 2023). The NIOST team facilitated monthly virtual CoPs, following each month's completion of video training, the implementation of the literacy practice, and the coaching session. These meetings offered programs a platform to share learnings, challenges, and successes, as well as receive updates from NIOST on other aspects of the initiative. Each CoP followed a consistent format:

- **Warm-Up Activity**: a community-building activity often centered around personal experiences with literacy.
- **Keeping It Real**: one or two programs shared their experiences with implementing light-touch literacy practices.
- **Extending the Learning**: the literacy coach provided further insights or clarification on the monthly literacy topic.
- **Small-Group Discussion**: facilitated breakout groups allowing program leaders to discuss their experiences with the monthly literacy topic.
- **What You Should Know**: a segment during which the NIOST team addressed initiative logistics.

These monthly meetings allowed staff to reflect, learn, plan, and support each other. Many staff found the breakout groups particularly helpful, as they provided a space for creative lesson planning and sharing ideas for delivering literacy skill-building activities. By discussing challenges with other program leaders, staff were able to find solutions to common obstacles. The CoP fostered professional connections and allowed staff to gain new insights, experiment with new strategies shared by their peers, access creative approaches, avoid common challenges, and continue growing with ongoing support.

Some programs kept a focus on light-touch literacy fundamentals; other programs explored ways to incorporate literacy into other program areas.

Reflections and Key Takeaways

The three-tiered model was successful in getting literacy practices into programs quickly, building confidence with literacy skill-building with both program leaders and direct service staff, and encouraging programs to set goals and plans for creating literacy-rich environments. Outcome findings are captured in the Philadelphia Out-of-School Time Literacy and Quality Improvement Initiative (NIOST, 2023).

Focus groups with youth participants highlighted the variety of literacy skill-building activities they experienced, such as independent reading, reading with a partner, being read to by staff, writing stories,

journaling, and playing word games (see Marshall, 2024 for additional findings).

Program staff appreciated the approach of integrating literacy skill-building into activities that were already taking place in their programs. The sense of confidence, excitement, interest, and engagement in literacy activities grew for both staff and children. Throughout the process, program leaders were engaged, eager to learn, and willing to try new things in their programs. Based on feedback gathered during CoP meetings as well as coaching calls, this dedication translated into authentic adoption of light-touch literacy practices. Even though a few programs struggled to keep up with trainings and implement practices, overall, programs saw significant positive changes in children's enthusiasm and engagement with literacy activities, including extended read-alouds, paired reading, journaling, collaborative writing, word games, vocabulary scavenger hunts, and book clubs, among others.

Key Takeaways

The following are important lessons learned from this program:

- **Readiness**: A program's existing commitment to ongoing quality improvement coupled with an intentional assessment of current readiness for change were key ingredients toward successful implementations.
- **Clarity of goals**: Staff felt more comfortable implementing light-touch literacy strategies when they understood that the goal of the initiative was to improve attitudes toward and engagement with literacy skill-building versus measuring school-related literacy achievement.
- **Customization**: Programs were given training on the same light-touch literacy practices, but the planning, implementation, and coaching were individualized to meet the needs and goals of each program.
- **Design for sustainability**: Learning activities were all designed with the realities of OST in mind and the goal of sustaining practices despite typical challenges such as staffing turnover, time available for professional development, and creating buy-in at all levels of program staff.

Conclusion

This three-tiered model made it possible for programs to access training on their own timeline, tailor strategies to their specific program, and receive ongoing support through coaching and peer learning. Together, these components ensured an environment in which programs could experiment, get feedback, and identify practices that worked for them. This approach helped to address the barriers of cost and time that affect a program's capacity for staff training, and worked for programs in a variety of settings with interest in adding or expanding literacy skill-building opportunities for their children and youth.

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An Opportunity for Community-Service Leadership Through Sports

Audrey Boyer

Sports can be a defining aspect for young people that shapes their identity. For me, starting at an early age, sports provided me with a community bonded by a shared passion. My journey began early with ballet at four, followed by soccer, softball, and basketball.

Basketball, which I started playing in sixth grade, captured my heart with its fast pace, teamwork, and energy. It was a place where individual talents could shine while contributing to a collective effort. Basketball became my outlet, my community, and the first arena where my community service leadership emerged.

During eighth grade, one of my teammates lacked proper basketball shoes, and I happened to have an uncomfortable pair of special brand sneakers that I decided to give her. She wore them the entire season, playing and expressing heartfelt gratitude. That moment was the spark for Soleful Sports, my project dedicated to leveling the playing field for youth athletes.

Soleful Sports started as a simple idea—a collection bin at my elementary school for gently used athletic shoes to distribute to local youth teams in need. Thanks to the support of out-of-school-time coaches and athletic directors, Soleful Sports grew. It evolved into an organization that provides free footwear and equipment to youth athletes who can't afford them in school districts throughout Fresno County. Through these opportunities, I learned that entrepreneurship can be about more than just business, it can be about serving a greater community.

The sports experiences I had in high school taught me the typical lessons of teamwork and perseverance. But they also taught me deeper lessons about social justice, empathy, and taking action. Without these experiences, I wouldn't have learned as much about myself or my community. All of these experiences happened outside of school hours, where my learning from school, home, and community were able to foster my curiosity and drive. These out-of-school time moments have shaped me into who I am today.

AUDREY BOYER is a high school senior and founder of Soleful Sports.

Afterschool Matters

Call for Papers

Afterschool Matters is a peer-reviewed journal dedicated to promoting professionalism, scholarship, and consciousness in afterschool education. Published by the National Institute on Out-of-School Time, *Afterschool Matters* serves practitioners who work with youth in out-of-school time (OST) programs, as well as researchers and policymakers in youth development.

We are seeking articles for future issues of the journal, beginning with Fall 2026. Scholarly or practice-based work on all aspects of OST programming for children and youth, from a variety of disciplines and academic perspectives, will be considered. We welcome submissions that explore practical ideas for working with young people in OST programs. Personal or inspirational narratives and essays are appropriate for our section "Voices from the Field."

All articles, whether scholarly or practice-based, should connect theory to practice and should be broadly applicable across the field. Articles must be relevant and accessible to both practitioners and academic researchers.

We invite you to discuss possible topics in advance with us. A broad variety of topics will be considered, including the following:

- Innovative program approaches in creative youth development, STEM, civic engagement, social and emotional development, or academic improvement
- Research or best-practice syntheses
- Key aspects of program leadership and administration
- OST system-building, such as cross-city and statewide initiatives
- Expanded or extended learning time and the OST hours
- School-community partnerships that support OST programming
- Physical activity and healthy eating
- Special needs youth, immigrant and refugee youth, or other vulnerable populations in OST
- Youth-centered participatory action research projects
- Gender-focused research and policy initiatives related to OST

Submission Guidelines

- For consideration for the Fall 2026 issue, submit your article no later than May 1, 2026, to ASMsubmission@wellesley.edu.
- Submissions should not exceed 5,000 words.
- Submit your article electronically in Microsoft Word or rich text format. Use 12-point Times New Roman font, double-spaced, with one-inch margins on all sides. Leave the right-hand margin ragged (unjustified), and number pages starting with the first page of text (not the title page, which should be a separate document).
- Include a separate cover sheet with the manuscript title, authors' names and affiliations, and the lead author's phone number and e-mail address.
- The names of the authors should not appear in the text, as submissions are reviewed anonymously by peers.
- Follow the *Publication Manual of the American Psychological Association, 7th Edition* (2019), for reference style guidelines. Present important information in the text and do not use extensive footnotes.

We welcome inquiries about possible article topics. To discuss your ideas, please contact:
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