

Advances in

Youth Development



*Research and Evaluation from
the University of California
Cooperative Extension
2001-2010*



Edited by

**Aarti Subramaniam
Katherine Heck
Ramona Carlos
Sharon K. Junge**



University of California
Agriculture and Natural Resources



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Youth Development Programming

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Foreword by

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Foreword

In 2000, the University of California 4-H Youth Development Program (4-H YDP) released *Advances in Youth Development Programming: Reviews and Case Studies from the University of California*, a sampling of research and evaluation being conducted by UC Division of Agriculture and Natural Resources (ANR) academic advisors and specialists. This work represented new thinking and approaches just as the field of positive youth development (PYD) was emerging. In the last decade the field of PYD has accelerated its evolution, fueled by increased research, empirical studies on youth development, and the release of the National Academy of Science's (National Research Council and Institute of Medicine Committee) *Community Programs to Promote Youth Development* in 2003. This led to increased interest in PYD by national level foundations such as Robert Wood Johnson, William T. Grant, Wallace, W.K. Kellogg, Annie E. Casey and others, all supporting the growth and development of PYD and assisting in the creation of a consistent language and framework for the field.

The nation's land grant institutions have been leaders in the development of the field of PYD with over a century of ensuring that the growing knowledge base was translated into effective community-based programs, especially its own 4-H club program, reaching over six million youth nationally. In the past decade the University of California 4-H YDP renewed its commitment to this endeavor and in 2003 released its new dual purpose mission and direction statement of engaging "youth in reaching their fullest potential while advancing the field of youth development." These efforts refocused the work and redefined its niche to innovate responsive programs and conduct relevant applied research for the betterment of California youth and families and the larger field of positive youth development. ANR workgroups provided much guidance to this task as did the nationally defined 4-H mission mandates around science, engineering, and technology, healthy living, and citizenship. The eleven articles in this volume of *Advances in Youth Development (2001-2010)* provide just a glimpse of

the research and evaluation conducted by the UC 4-H YDP over the past decade on these topics.

On the horizon, the California 4-H YDP will continue to advance the field of youth development. The recently launched large-scale implementation of thriving, a new construct from which to view youth development research, theory, and practice, will provide cutting-edge guidance for PYD program delivery. Additionally, as part of ANR's Vision 2025 and division-wide initiatives, the California 4-H YDP will broaden its scope to focus on the relevance its work has on policy. This is an evolutionary phase for 4-H and the broader field of PYD, which over the past two decades has found its intellectual niche, defined its framework and parameters, and conducted and compiled evaluation and research to inform best and effective practices. Bridging PYD research and practice with policy seems the next step in the maturation process for the 4-H YDP as it continues along its own developmental pathway. 4-H will continue to identify and exemplify new approaches to youth issues which will lead to greater policy awareness and informed community decision-making. The ultimate goal for the 4-H Youth Development Program will continue to be to enhance the positive youth development of all California youth.

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Introduction

The University of California Cooperative Extension (UCCE) system promotes positive youth development through its commitment to bridge research and practice. To achieve this end, program staff, county-based academics, and campus-based researchers are in constant dialogue. The benefits of this type of interaction have been captured in this volume, featuring work from 11 research and evaluation projects – a mere glimpse of the range and breadth of topics and programs that have been undertaken in the past decade within California 4-H.

Organizational mandates and structures have influenced the outcomes of research and evaluation in the last ten years. For this past decade, UCCE actively promoted workgroups, which involved groups of academics from campus and county collaborating around a specific research area. Several of the research and evaluation papers in this volume are a product of these teams coming together. Additional papers involve collaborative research projects outside of the workgroup framework. The topics represented by this collected volume include health and healthy living, citizenship, leadership, life skills, and science education.

We have organized this volume starting with four papers that contribute to youth development research. Following this, four articles are presented that evaluate various 4-H youth development programs. Finally, the volume ends with three articles on evaluations of program resources for staff and volunteer development.

King & Murray address a critical topic in the first paper, examining the influence of body self-image in the treatment of childhood obesity. Their research highlights psychosocial variables that may influence childhood obesity in African American girls and boys. King and Murray's analysis provides important data for obesity prevention policies in minority populations, a topic that has been gaining increasing attention in recent years.

The paper by Heck & Nathaniel, uses data from a study conducted by the Teen Decision Making subgroup of the Adolescent workgroup. The study provides new insights into the influence of urban, suburban, or rural residence as a factor in teen driving.

This paper provides an ecological perspective on risks associated with adolescent driving.

Murdock, Patterson, Lee, and Gatmaitan present work on youth-adult partnerships based on a study conducted by a collaborative research team in the Bay Area. The study contrasts successful practices in organizations that are effective in promoting youth voice with those that are not as effective. Their results provide further support for the idea that organizations need to make a significant commitment to promote youth voice.

Moncloa, Schmitt-McQuitty, Go, Nathaniel, and Truong describe research in the area of afterschool programming, which grew out of work of the Afterschool workgroup. Their research highlights the importance of relationships in potentially bridging afterschool program outcomes and academic outcomes. The importance of a positive youth development environment in a school setting for young people's healthy social and academic development is brought out here, and again has substantial policy implications in a time where there may be limited resources to provide for these supports in public schools.

Two papers in this volume focusing on program evaluation feature outreach youth development programs that are effective in engaging young people from diverse and lower-income communities. Bird and Subramaniam's paper showcases a program called 4-H On the Wild Side that engages elementary students from low-income schools in experiential and environmental science learning through an overnight weekend camp program, led by teens. Consistent positive outcomes indicate that the program has been successful in increasing participants' learning in environmental science as well as being an empowering experience for teenagers. In her paper, Conklin-Ginop highlights a Sonoma County program called 4-H Bloco Drum and Dance, which has also been successful in reaching minority youth. The evaluation shows evidence that an arts-based program can be successful in facilitating positive impacts for young people in a broad range of areas such as healthy living and nutrition, attitudes toward gang involvement, and self-esteem. Both of these

programs may be duplicated in other settings to test whether there are similar positive outcomes.

Mahacek and Worker share their process of developing and evaluating a new 4-H Robotics curriculum. Improving youth science literacy through nonformal science education is an important component of the 4-H program. To provide such education, it is necessary to have engaging curricula that can provide information through experiential learning in an inquiry-based format. Such curricula are important in providing developmentally appropriate, research-based programming for young people that will meet future needs for workforce preparation. The authors discuss the importance of engineering curricula for young people and describe the formative evaluation they undertook in their curriculum development process.

The final paper in this section, by Matthieson, Horowitz, Neelon, Smith, and Kaiser, shares insights gained through an evaluation of a 4-H healthy living curriculum. Their study brings out clearly the challenges in evaluating nutrition curricula, and offers a discussion on selecting appropriate methodologies for different types of nutrition evaluation. Their mixed methods approach is a noteworthy example of the ways in which impacts of nutrition curriculum can be assessed.

In recent years there has been a strong impetus within California UCCE to build the capacity of youth development staff and volunteers through resources that facilitate intentionality in programming. The last three papers in this volume reflect the efforts undertaken to build and test these resources. Junge and Manglallan share their development and evaluation of a science, engineering and technology training program for afterschool program staff. The work presented here reflects a bridge between training programs for non-formal and formal schooling as the curricula are based on national science standards, but still retain experiential and learner-centered qualities that are a key feature of non-formal learning environments.

Schmitt-McQuitty and Smith provide information on the relevance of the experiential learning model within a nonformal learning context, and the importance of training volunteers so that they fully understand and apply this model rather than

conventional, lecture-based teaching methods. They also describe the impact of their training in this area on volunteer knowledge and attitudes toward experiential learning.

Young and Sousa describe the work and products of the 4-H Leadership Development workgroup – namely creating resources for 4-H staff and volunteers including a Digest – a type of manual, and training modules designed for a train-the-trainer format. These resources developed in the last three years may be effectively customized for use in other states and add to the dialogue on staff and volunteer impact.

As is evident from this summary of chapters, there is a wide range and diversity reflected in the topics that have been studied and programs that have been developed in the 4-H Youth Development program in California over the past decade. These papers represent only a small slice of the work that has been done in engaging young people in positive youth development programming, and advancing the field of research in positive youth development. However, these articles capture an effort to bring research based knowledge into the field of practice, or influence program policy, for the ultimate purpose of facilitating positive outcomes for young people.

Editors

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Overweight and Self-Perceptions of African American Children

Nicelma J. King and Carolyn B. Murray

The study examines the self-perceptions of two groups of overweight African American children, in Oakland, California. There are two research questions: a) What is the self-perceived body image of overweight African American children?; and b) How do body mass index (BMI) and body dissatisfaction influence self-perceptions of these children? The study utilizes quasi-experimental design with participants divided into high-intensity and low-intensity intervention groups. Height, weight, and self-perception assessments were measured at baseline and after one year. Participants were aged 9-10 years old; had one African American parent, and had BMI < 85th percentile. The high-intensity intervention consisted of weeklong summer day camp and once-weekly activity nights stressing physical activity and nutrition education, while the low-intensity intervention consisted of nutrition information materials mailed to participants quarterly. The children in both groups underestimated their level of overweight, regardless of their degree of overweight. At one year, BMI was associated positively with self-worth for girls in high-intensity group and negatively with body satisfaction for boys in both groups. For boys in the low-intensity group, body dissatisfaction was associated negatively with self-worth.

By any measure, Americans are becoming more overweight (CDC, 2008b). Even in childhood, overweight and obesity have increased dramatically, and CDC data indicate that overweight among children aged 6-11 has more than tripled since 1980, from 6% to 18.8% (CDC, 2008a, 2008b), while Type 2 diabetes has doubled. The connection between increased rates of overweight among young people and Type 2 diabetes has resulted in earlier diagnosis of the disease, with up to 45% of new cases occurring among those under the age of 19 (ADA, 2000). Type 2 diabetes impacts the African American community disproportionately: 9.8% of non-Hispanic whites over age 20 have Type 2 diabetes, compared with 14.8% among African Americans (ADA, 2000).

The body mass index (BMI) cut points for pediatric overweight and obesity are somewhat controversial, but the 85th percentile is generally regarded as the cut point for risk of overweight or overweight, and the 95th percentile for obesity (Krebs et al., 2007). Numerous studies have identified many of the factors

contributing to the obesity epidemic: poor diet and eating habits, lack of physical activity options, and the impact of high fat and sugar food and beverage marketing targeted to children and poor communities of color (Alleyne & LaPoint, 2004; Ebbeling & Ludwig, 2008; Smith, Rhodes, Naylor, & McKay, 2008; Tirodkar & Jain, 2003).

This article examines the impact of a nutrition education and physical activity intervention on the self-perceived body image, body satisfaction, academic and athletic competence, physical appearance, social acceptance and global self-worth among a group of overweight and obese 9 and 10 year-old African American children from two low-income areas of Oakland, California.

Body Satisfaction

The literature indicates that African American adults and children appear to be less concerned overall than Whites about societal emphasis on thinness. While African American girls have a higher rate of overweight than White girls (Ogden, Carroll, & Flegal, 1997; Ogden, Carroll, Curtin, Lamb, & Flegal, 2010), several studies have found they feel more satisfied with their bodies than White girls (Adams et al., 2000; Andres, 2007; Kelly, Wall, Eisenberg, Story, & Neumark-Sztainer, 2005; Lyons, Carlson, Thurm, Grant, & Gipson, 2006;

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Nishina, Ammon, Bellmore, & Graham, 2006). Although boys are less frequently studied than girls, the existing literature indicates a fairly low level of concern about overweight among African American and White preadolescent boys (Adams et al., 2000; Eisenberg, Newmark-Sztainer, & Story, 2003). Some researchers have suggested that African American males perceive larger body shapes and sizes as more desirable and attractive for themselves, as well as for those of the opposite sex (Adams et al., 2000; Jones, Fries, & Danish, 2006; Story, French, Resnick, & Blum, 1995). Across gender and race, however, children who report that they are teased or bullied about their weight report lower body satisfaction than those who are not (Eisenberg et al., 2003; Nishina et al., 2006). The immediate culture in which adolescent girls live, especially the degree of parental or peer support they experience, contributes to their body satisfaction (Kelly et al., 2005).

RESEARCH QUESTIONS AND METHODS

There are two research questions for this study:

- a) What is the self-perceived body image of overweight African American children?
- b) Do BMI, gender or body image dissatisfaction influence other self-perceptions of these children?

The data reported in this study are a subset of data collected for a larger study of Type 2 diabetes risk in overweight African American children (Raman et al., 2008; Raman, Ritchie, Lustig, & Fleming, 2010). African American children were recruited from schools and community-based venues in two low-income neighborhoods of Oakland, California, with high concentrations of African American residents. The part of the study reported here focuses on the psychosocial outcomes of the intervention on the participants.

Children who were eligible for participation in the study met the following criteria: *a)* they had at least one African American parent; *b)* they were 9 or 10 years old at the time of recruitment; *c)* they had BMI at or above the 85th percentile when matched for gender and age; *d)* they were free of any systemic or metabolic disorders and not taking medication known to affect energy, metabolism or body weight; and *e)* they were free of physical or emotional factors that would interfere with consistent participation in the

program.

A total of 165 subjects were recruited into the study. 52 girls and 36 boys were assigned to the high-intensity intervention group, which participated in a one-week summer day camp concentrating on physical activity and nutrition education, with monthly follow-up “family nights” for the participants and their parents that focused on healthy eating and physical activity, including swimming, dancing and games. Attention was also devoted to self-esteem building activities. 42 girls and 35 boys were assigned to the low-intensity intervention group, which received educational materials on nutrition and physical activity that were mailed to their homes on a quarterly basis. Both groups participated in the periodic anthropometry (weight, height, measurement) and blood chemistry studies.

Metrics and Instruments

Several measurements were used to gather data related to body size, body image, and self-esteem. The participants’ body weight, height, waist and hip measurements were collected with subjects lightly dressed and without shoes or jewelry. Height was measured with a stadiometer, and weight was measured with electronic scales. Body Mass Index (BMI) was calculated as weight (kg) divided by height squared (m²) (NCHS, 2008). Waist-to-hip ratio (WHR) was calculated using the other measurements collected.

Body image, which is a mental picture of one’s own body, was measured by a widely-utilized figure-rating scale developed in a study of pre-adolescent children (Collins, 1991). The instrument consists of two identical sets of female or male silhouettes. On these two figures, participants mark their perception of their current body silhouette and the silhouette that best represents how they would *like* their body to look. The male-specific instrument used to measure body image is included as Figure 1A, and the instrument used to measure the female body image is Figure 1B.

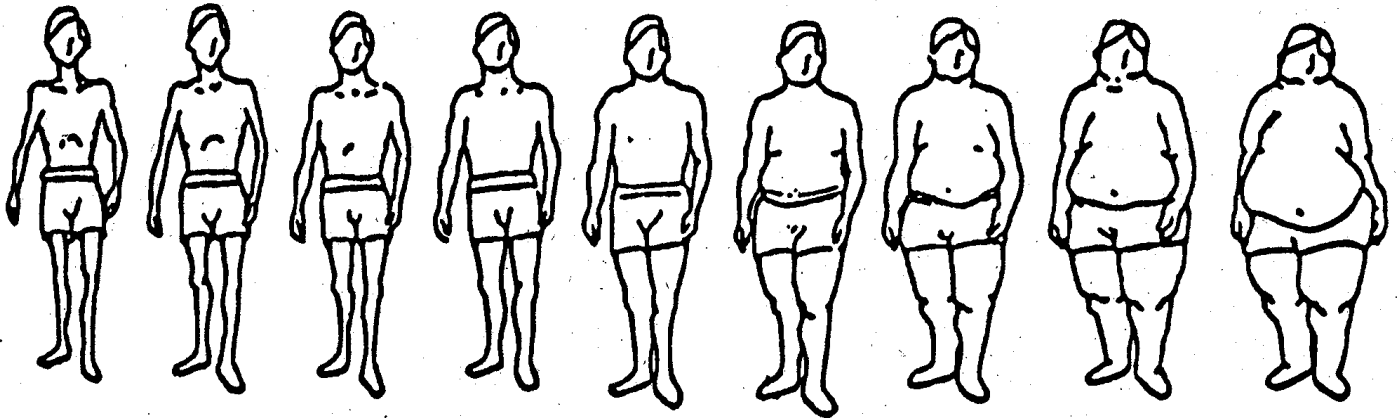
Body dissatisfaction was calculated using the difference in the numbers assigned to the two silhouettes on the body image questionnaire. Each unit of difference between the two images was scored as a unit of body dissatisfaction such that the scale

FIGURE 1A
Body Image Assessment Instrument

The drawings below show different sizes of bodies.

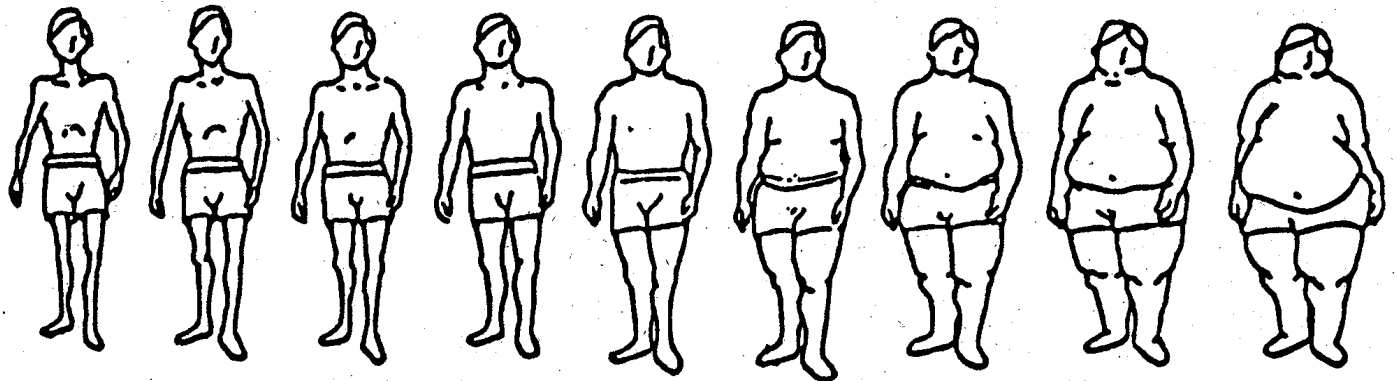
In the drawings below, put a check mark (X) on the line below the picture that is most like your body.

Your body NOW



In this second set of drawings, put a check mark (X) on the line below the picture that is how you would like your body to be.

How you would like your body to be?



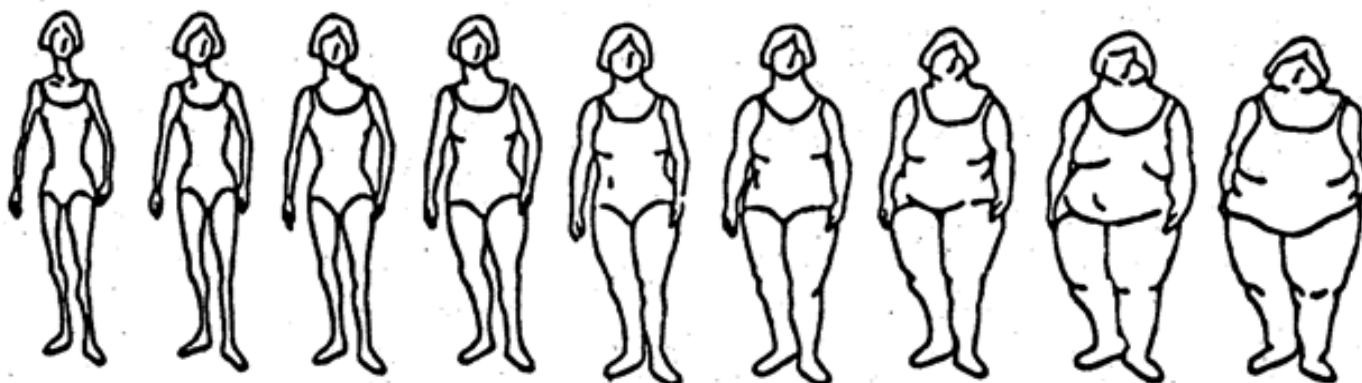
When you are finished, fold this paper and put it in the envelope.
(Source: Collins, 1991)

FIGURE 1B
Body Image Assessment Instrument

The drawings below show different sizes of bodies.

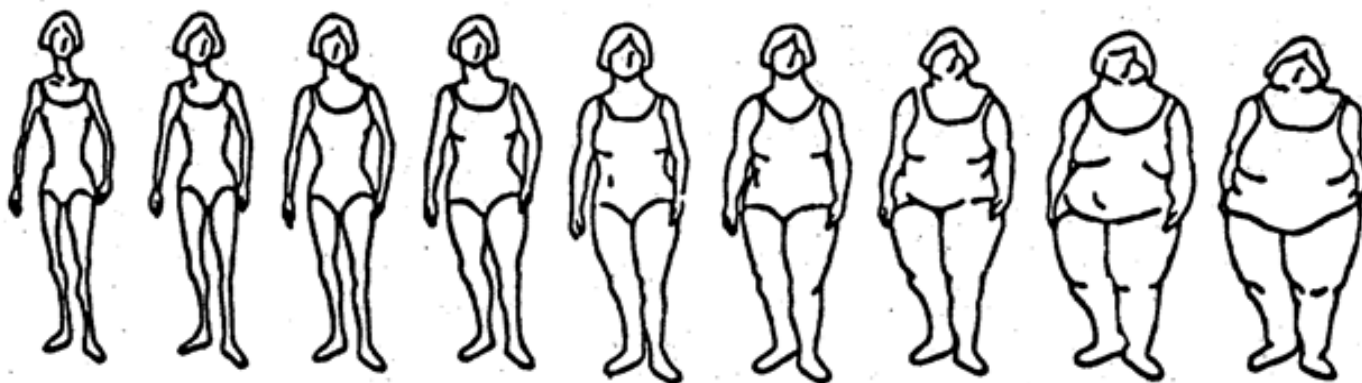
In the drawings below, put a check mark (X) on the line below the picture that is most like your body.

Your body NOW



In this second set of drawings, put a check mark (X) on the line below the picture that is how you would like your body to be.

How you would like your body to be?



When you are finished, fold this paper and put it in the envelope.

(Source: Collins, 1991)

could go from “0”, representing complete body satisfaction, to “8”, representing the greatest possible difference between the two body images.

The Harter Self-Perception Profile for Children (Harter, 1985) is designed to evaluate six domains or sub-scales of perceived competence and self-adequacy: global self-worth, academic competence, physical appearance, behavioral conduct, athletic competence and social acceptance. Each sub-scale contains six items, and each item is scored from 1 to 4 where 4 represents the most positive self-judgment and 1 the least. Scale scores are the average of the item scores. The internal consistency of the items within each sub-scale was assessed using Cronbach’s criterion (Cronbach & Warrington, 1951).

Using SPSS (SPSS Inc.), descriptive and inferential statistics were calculated to compare girls and boys from both the high-intensity intervention and low-intensity intervention groups. Student’s *t* statistic was used to identify any statistically significant differences between the two intervention groups at baseline, to assure the comparability of the high-intensity and low-intensity intervention groups. Pearson’s correlation was used to determine the associations between body mass, body image and the self-perception variables from the Harter scale and to analyze the strength and significance of those relationships.

RESULTS

At baseline, there were no significant differences between the two intervention groups in the means of BMI, waist measurement, waist-hip ratio, body image, body dissatisfaction, athletic competence, academic competence, social acceptance, and assessment of behavior. For girls only, there were significant differences between the mean scores of the high and low-intensity groups on global self-worth ($t = 2.45$, significant at .05 level), with girls in the high-intensity group having higher global self-worth scores.

Self-Perceived Body Image

At baseline, the participants assessed their current body image using silhouettes from 1 (very thin) to 9 (very rounded). Most of the boys and girls reported their current size as somewhere around the middle, 4 or 5, even though their group mean BMI percentile was above the 90th percentile for their age and gender

(girls’ BMI $\mu = 96.7$; $\sigma = 5.2$; girls’ current body image $\mu = 4.77$, $\sigma = 1.16$; boys’ BMI $\mu = 95.6$; $\sigma = 5.9$; boys’ current body image $\mu = 5.01$, $\sigma = 1.02$). The 23 girls in the highest quartile of BMI were above the 99th percentile of BMI. Five of these girls reported that they saw their current body silhouette as “4”, 10 saw their current silhouette as “5”, and only 3 girls in the quartile saw their silhouettes above “6”. Among boys, the highest quartile represented the 18 boys with BMIs above the 99th percentile. In comparison, 2 of the boys saw their body image silhouette as “4”, 3 saw their body image as “5”, and 8 saw their body image as “6”. Five of them saw their body image silhouette as above “6”. This suggests that as a group, boys had a somewhat more realistic assessment of their body’s silhouette than did girls, but that the majority of the participants had self-perceived body silhouettes inconsistent with their BMI.

The Relationship Between BMI, Body Image, Gender and other Psychosocial Variables

The variables used to measure the participants’ psychosocial status were body dissatisfaction, academic competence, athletic competence, self-appraisal of physical appearance, social acceptance, and global self-worth. In addition, the measure of body dissatisfaction was also used as a psychosocial measure. Correlation coefficients were calculated between these variables and the participants’ BMI percentile for age and gender, which proved to be the most robust measures of overweight. The results of this analysis are presented in Table 1.

TABLE 1
Pearson’s Correlation Between BMI Percentile and Perception Variables at Baseline

<i>Perception Variable</i>	<i>Female (94)</i>	<i>Male (72)</i>
Academic Competence	.172*	.137
Athletic Competence	-.062	-.342**
Physical Appearance	-.022	-.320**
Social Acceptance	.150	-.220*
Self-Worth	.148	-.257**

* $p < .05$ level

** $p < .01$ level

*** $p < .001$ level

BMI percentile was correlated with body dissatisfaction for boys and girls, although the relationship for boys was more significant than for girls at baseline, as Table 1 illustrates. BMI percentile was associated with reports of stronger academic competence for girls. BMI was also negatively associated with athletic competence for boys. As boys' BMI percentile increased, they also reported significantly more negative views of their physical appearance, social acceptance and self-worth. None of these variables was significantly associated with increased BMI for girls.

Using body dissatisfaction as an independent variable and examining its relationship with the other perception variables resulted in significant negative correlations for girls between body dissatisfaction and their assessment of physical appearance ($R = -.295, p < .05$) and global self-worth ($R = -.294, p < .05$).

During the year between the baseline measures and the post-intervention measures, 19 girls (20% of the sample) and 13 boys (18% of the sample) dropped out of the study. There were no substantive differences on any of the measured variables between the dropouts and those who were retained in the study.

After a year in the program, both the high-intensity and low-intensity intervention groups had increased their BMI. In addition, both groups had significantly increased their average waist measurements ($p < .01$). Table 2 presents the results of the correlations between body dissatisfaction and the perception variables after one year of the intervention.

While among boys, body dissatisfaction was highly correlated with BMI percentiles ($R = .632$ and $.523$ for high-intensity and low-intensity intervention boys respectively, $p < .05$), there was no such correlation for girls. Body dissatisfaction was associated with low self-perceptions of most of the variables for boys in the low-intensity intervention group, significantly for self-worth, social acceptance, physical appearance and athletic competence. For boys in the high-intensity intervention group, body dissatisfaction was negatively associated with social acceptance. Even though BMI was positively correlated with body dissatisfaction for boys, the

correlates of body dissatisfaction are not the same as those for BMI. Thus, even when BMI increases, boys in the low-intensity intervention group did not experience negative self-perceptions unless they also have high levels of body dissatisfaction. For girls, body dissatisfaction was associated negatively with perceptions of physical appearance.

TABLE 2
Correlation Between Participants' Body
Dissatisfaction and Perception Variables at Year 1

<i>Perception Variable</i>	<i>High Intervention</i>		<i>Low Intervention</i>	
	<i>Female</i>	<i>Male</i>	<i>Female</i>	<i>Male</i>
Academic Competence	-.140	.053	-.201	-.316
Athletic Competence	.098	-.205	-.176	-.539*
Physical Appearance	-.292	.026	-.394*	-.482*
Social Acceptance	.121	-.503*	-.300	-.415*
Self-Worth	-.083	.095	-.158	-.535*

* $p < .05$ level

** $p < .01$ level

DISCUSSION

One year of participating in this intervention did not result in reduced BMI for these African American children whose overweight puts them at risk of developing Type 2 diabetes, but the participants' perceptions of themselves, and especially the very different responses of girls and boys, raise several questions that need further discussion and study. First, the participants mostly saw themselves as having an average or slightly below average silhouette, even though they were selected because they were at risk of overweight by the currently-accepted standards of the CDC. This underestimation of their weight might be explained by two circumstances: 1) the tolerance for higher degrees of overweight in African American communities, and 2) the tendency of low-income African American mothers to underestimate the weight of their children.

As mentioned earlier, overweight and obesity among children has significantly increased since

1980 (ADA, 2000; Ebbeling & Ludwig, 2008; Ogden, Carroll, & Flegal, 2008). Recent estimates place 34% of African American children aged 9-12 at or above the 85th percentile (Ogden et al., 2008). Research consistently indicates that the African American community is more tolerant of higher weight than some other ethnic communities (Andres, 2007; Bailey, 2006; Baughcum, Chamberlin, Deeks, Powers, & Whitaker, 2000; Dietz, 1998). No recent analyses have been conducted of low-income African American communities in particular, but overweight and obesity are more prevalent in low-income than in middle and upper income communities (Ahn, Juon, & Gittelsohn, 2008). This sample was drawn from low-income communities where overweight is likely more prevalent; because of this higher prevalence, overweight children may be regarded as normative. If this is so, it is understandable why they might view themselves as “average” in body size. Other studies of pediatric and adolescent obesity support this possibility (Collins, 1991; Frisby, 2004; Sisson, Franco, Carlin, & Mitchell, 1997; Thomas, 2006).

The participants’ views of themselves as “average” may also be reinforced by their parents’ perceptions. Research indicates that African American and Hispanic mothers, especially if they are low-income or have low education, underestimate their children’s body weight (Baughcum et al., 2000; Jain et al., 2001; Killion et al., 2006). Given that children’s first images of themselves reflect the views of the adults around them, it is possible that these young participants’ body images have been influenced by their parents’ attitudes about their body weight. If this is the case, interventions designed to reduce childhood obesity among African American children need to address parental perceptions if they expect to change the self-perceptions of the children.

The analysis of data from this study reveals an association between BMI and increased self-worth in the high-intensity intervention girls, and decreased self-worth in low-intensity intervention boys. The results for girls are consistent with other research demonstrating that the self-esteem of African American girls is less influenced by overweight than is the case in Asians and Caucasians (Andres, 2007; Lyons et al., 2006; Nishina et al., 2006). It is possible that the high-intensity intervention girls had their self-

worth bolstered by the activities and interactions of the intervention, which were targeted to improving self-esteem. This supports research (Alleyne & LaPoint, 2004; Ward, 1996) that concludes African American girls’ self-concepts are more related to other values, such as competence, resourcefulness, and relationships with family and community than by externally-established standards of beauty.

Among boys in both groups, body dissatisfaction was strongly associated with increased BMI. These results are also consistent with two studies of the limited number that include dissatisfaction with body weight for African American boys (Nishina et al., 2006; Paxton, Eisenberg, & Neumark-Sztainer, 2006). Other studies have either included so few African American boys that no distinct conclusions could be drawn for them (Wood, Becker, & Thompson, 1996); concentrated solely on the boys’ views of acceptable weights for *females* (Thompson, Sargent, & Kemper, 1996); or concluded that boys’ worries about their weight were only concerned with lack of muscle development.

Although it is possible that the intervention may have buffered the negative consequences of high BMI on self-worth for boys in the high-intervention group, the relationship between increased BMI and low self-worth among boys in the low-intensity intervention group is worrisome. While overweight has not been studied as a risk factor in the study of ecological factors associated with developmental outcomes for African American males, it is possible that it is an important contextual factor over time. This is especially important because overweight is associated with increased height and bone age, and may result in African American boys being seen as older and more mature than they actually are (Dietz, 1998). This has potentially negative consequences for their treatment in schools, by social service personnel, and for their interactions with law enforcement. If further research confirms these relationships, overweight can be especially important in further specifying models that “unpack” poverty as an explanatory variable in understanding the high proportion of negative life cycle outcomes that occur for African American males in US society. Such models include Spencer & Swanson’s Phenomenological Variant of

Ecological Systems Theory [PVEST] (Spencer, Dupree, Cunningham, Harpalani, & Miller, 2003; Swanson, Cunningham, & Spencer, 2003) and studies of positive youth development (Catalano, Berglund, Ryan, Lonczak, & Hawkins, 1998; Lerner & Castellino, 2002; Prelow, Weaver, & Swenson, 2006).

CONCLUSION

Although this study analyzes relationships between BMI and a series of psychosocial outcome variables, including body dissatisfaction, academic competence, athletic competence, global self-esteem, behavior, physical appearance, and social acceptance, the realities are much more complex than can be described by a linear model. Ecological systems theories suggest that input variables, such as health, interact with contextual variables in children's lives, and the choices these individuals make to produce outcomes throughout the developmental cycle (Bronfenbrenner, 2000; Swanson, Spencer, Dell'Angello, Harpalani, & Spencer, 2002). Those choices, which include long-term food selection and physical activity habits, will determine whether these youth develop Type 2 diabetes, other negative health consequences associated with overweight, or other poor life cycle outcomes that African Americans experience disproportionately.

The numbers in this study are small in the subgroups and the data only reflect one year of intervention. Longer-term study of culturally-sensitive interventions is needed to understand what works in helping African American children to reduce their BMI and avoid the negative health outcomes associated with overweight and obesity. In addition, there is a need to understand how these interventions provide buffering influences on the negative psychosocial impact of overweight, especially for boys. Currently, there are few studies of childhood or adolescent overweight that focus on its psychosocial impact on boys. The impact of long-term body dissatisfaction and low self-esteem on African American boys with high BMI deserves more study.

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Driving Among Urban, Suburban and Rural Youth in California

Katherine E. Heck and Keith C. Nathaniel

Improving safety among young drivers depends partly on a full understanding of the experiences and needs of those young people. Driving practices and experiences may vary significantly between rural, suburban and urban youth, but these differences have been little explored. The availability of public transportation, travel distances, demographic differences and other factors could lead to variations in driving behaviors among urban, suburban, and rural youth. This descriptive analysis examined differences in driving experiences and behaviors between youth who live in large metropolitan communities compared with those living in suburbs and rural areas. Results showed that urban youth were significantly less likely to be licensed than youth in suburban or rural areas, and that was associated with significant variation both in reported amount of time driving and in the likelihood of driving unlicensed. In general, rural and suburban youth reported spending more time behind the wheel, and were also more likely than urban youth to report risk behaviors associated with driving such as reckless driving or driving after using alcohol. These results provide support for targeted education and enforcement measures to improve safety among young drivers.

Youth driving has been a focus of research and regulation for several decades. Each year, more than 4,000 teenagers are killed in car accidents; these young people represent between 28 and 30 percent of the total cost of vehicular accidents, although they are only 14 percent of the population (Centers for Disease Control and Prevention, 2008). A number of factors combine to affect the risks of young people driving. One of these factors which has been relatively little researched is the impact of urbanicity of the environment on youth driving safety and behaviors.

Urban, suburban, and rural youth experience differing road conditions and in some cases, differing reasons to drive. Urban youth are likely to have greater access to public transportation and shorter distances than rural or suburban youth. Rural and suburban youth tend to use cars for travel more than urban youth do (Jones, Davis, & Eyers, 2000). In addition, the differing environmental circumstances of driving in a city or town compared with a rural area,

where there are fewer driveways and other physical obstructions as well as fewer vehicles on the road, may impact the challenges perceived by the driver.

Driving experiences vary by place, which could cause variations in youth driving behaviors across geographic contexts. The urbanicity of the driving context has been shown to be associated with the difficulty of driving with respect to cognitive load on the driver (Harms, 1991); driving in an urban area tends to be more cognitively taxing, and that more challenging experience is associated with lower driving speed. Driving in rural areas also imposes fewer demands on the driver's visual attention than driving in urban areas (Lansdown, 2003). Youth who drive in urban areas therefore can expect a more demanding driving experience cognitively. The continued growth of urban centers – urban sprawl – also increases the amount of miles driven and the potential for accidents among teens (Trowbridge & McDonald, 2008).

However, despite the less cognitively challenging environment, rural youth may experience excessive risk due to driving speed. Speed is a strong predictor of the impact of injury on car passengers, and rural areas tend to have higher driving speeds. Data show that fatalities and hospitalizations for children and youth related to automotive crashes are significantly higher in rural areas than in urban ones (Kmet & Macarthur, 2006).

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In addition to speed, a risk associated with driving that has been demonstrated to vary significantly across urban, suburban and rural youth is driving after alcohol use. Rural youth have been reported in a number of studies to have higher rates of driving after drinking (Pruitt, 2009; Muilenberg, Johnson, Usdan, Annang & Clayton, 2007; Greggo, Jones, & Kann, 2005). This finding parallels research that generally shows alcohol use, particularly binge drinking, to be more common among rural than among urban adolescents (e.g., Cronk & Sarvela, 1997).

Some research also indicates that cultural differences may underlie differing risk taking behaviors in rural, suburban, and urban areas. Dunkley (2004) found that rural communities had a higher tendency to encourage risk taking behaviors, particularly among boys. In addition, compared with urban drivers, rural drivers have a greater tendency to underestimate risk perceptions of behaviors such as failing to wear seatbelts, and have lower appreciation for governmental interventions with respect to road safety (Rakauskas, Ward, & Gerberich, 2009).

This study used survey data from high school seniors in several urban, rural, and suburban areas in California to examine behavior and risk differences among youth from varying driving contexts.

METHOD

For this analysis, urban was defined as cities of at least 75,000; rural or small town comprised areas with populations under 10,000; and suburbs were towns of 10,000 to 75,000. High school seniors at twelve high schools in California were surveyed for this study. The 488 urban students in the sample were drawn from three large, inner-city public high schools in each of three California cities. The study also included 1,052 youth surveyed whose four high schools were located in suburban areas, and 400 youth who attended five high schools in rural areas. Counties from which data were collected for this study included Sacramento; Yolo; Fresno; Madera; Tulare; Kern; and Los Angeles.

Seniors at each of these schools were surveyed in their English classes during 2006 about their driving patterns and behaviors. The survey was developed following a review of current literature about issues

in teen driving and included information about licensure, driving experiences and behaviors, and driver education, as well as family rules around driving. A Spanish version of the survey was provided for those students who wanted or needed to take the survey in Spanish, although the vast majority of surveys were completed in English. Parents were allowed to opt students out of participation, but only 12 parents did so. Surveys were tabulated using Excel and analyzed in SAS (SAS Institute, 2004). *P*-values for differences among urban, suburban, and rural groups were calculated using Mantel-Haenszel chi-squares in SAS.

RESULTS

Demographics

Demographic characteristics for urban, suburban, and rural youth in this sample are displayed in Table 1. Approximately half of urban youth were Latino, similar to the rural sample, but higher than the percentage for suburban youth who were sampled. Urban youth were more likely to be Asian/Pacific Islander or African American and less likely to be white than were suburban or rural youth. Most urban youth attended a low-income school (a school with at least half of students receiving free- or reduced-price meals); 18 percent attended a moderate-income school (with between 20 and 49 percent of students receiving free- or reduced-price meals), and no urban students attended a higher-income school (with fewer than 20 percent of students receiving free- or reduced-price meals), which contrasted sharply with the suburban students, about 39 percent of whom attended a high-income school.

Driver Education and Training

Learning to drive is an important milestone for many adolescents, and involves a sequence of events, typically including in-class driver education, in-car driver training, and often practice with parents in the family car. Adolescents who are learning may rely on a variety of resources in the learning process, including parents or other family members, teachers, friends or others. This survey included a question about the resource the student perceived as being most important to them when learning to drive. Across all three groups of youth (urban, suburban, and rural), parents were most frequently reported as the most important resource

TABLE 1
Demographics

	<i>Urban</i> <i>n=488</i>	<i>Suburban</i> <i>n=1052</i>	<i>Rural</i> <i>n=400</i>	<i>p-value</i>
Race/Ethnicity				
Latino	49.0	32.0	54.1	< .0001
White	11.2	52.3	36.2	
Asian/Pacific Islander	21.2	10.4	3.0	
African American	16.8	2.7	2.5	
Native American	1.9	2.5	4.1	
Gender				
Male	52.1	50.3	53.2	.7942
Female	47.9	49.8	46.8	
School income level				
High-income school	0.0	38.9	26.3	< .0001
Moderate-income school	17.8	61.1	32.3	
Low-income school	82.2	0.0	41.5	

for young people in learning to drive. Driver training, the in-car component of driving education, was reported as the most important resource for 30 percent of suburban youth and 21 percent of rural youth, but only 13 percent of urban youth (although differences across the three groups were statistically nonsignificant). Driver training is required for obtaining a license in California, but is also expensive, typically several hundred dollars for the six hours of professional training in a car that is required for receiving a driver's license before age 18. Since most of the urban youth in this sample attended low-income schools, many of them may come from families unable to afford driver training, which may contribute to the lower perceived importance of driver training as an important resource.

Driving Characteristics and Experiences

Respondents' driving characteristics and experiences are shown in Table 2. Urban students were far less likely than suburban or rural students to report having a driver's license or permit; almost two-thirds of urban students had neither of these. Despite reporting having no license or permit, most urban youth (as well as most youth in other places) did report driving on occasion. Comparing responses on driving to responses on licensure allowed us to examine the legality of driving

among youth in this sample. In urban areas, about 28 percent of young people reported driving even though they had neither a permit nor a license. This value was higher than among youth in suburban or rural areas. Urban youth were significantly less likely than youth in rural or suburban areas to be driving legally, and were more likely to be nondrivers.

Respondents who did not have a permit or a license were asked why not. Youth gave a wide range of reasons. However, despite the higher rate of nonlicensure among urban youth, the reasons for not obtaining a license were similar across urban, suburban, and rural youth. Not having access to a car and the cost of insurance or obtaining a license were predominant reported factors across all three groups, as was just not being interested in or wanting a license, waiting to turn 18, or not being allowed to obtain one. Many youth in all areas also reported being too busy to obtain a license, or that the driving rules for teens were too restrictive. Urban youth were significantly less likely than rural or suburban youth to report being an undocumented immigrant as a reason for not having a license.

Among youth who were driving, most reported getting to school as a primary reason for driving, although this was more common in suburban areas than in urban or rural ones. Rural schools likely have better school bus coverage than other areas, while urban schools are less likely to have available parking for students. Suburban youth were also more likely than urban or rural youth to report driving to their own activities such as clubs or sports practice; otherwise, urbanicity was not associated with reasons for driving.

Rural youth reported driving slightly more hours per week than urban or suburban youth. Urban respondents were less likely than other youth to report driving after 11:00 pm, which is the legal curfew for youth with fewer than 12 months post-licensure.

Fewer than one in five youth reported having been in a crash as a driver, but among those who had been in a crash, urban youth (30 percent) were more likely than suburban youth (12 percent) or rural youth (9 percent) to say someone was hurt in the crash. Urban youth were also more likely (48 percent) to

TABLE 2
Driving Characteristics (Percentages, except hours per week)

	<i>Urban</i>	<i>Suburban</i>	<i>Rural</i>	<i>p-value</i>
Licensure status				
Have a license	23.5	64.5	50.5	< .0001
Have a permit	13.3	9.7	15.5	
Neither license nor permit	63.2	25.8	34.0	
Driving and legality				
Driving legally	36.8	74.2	66.0	< .0001
Driving illegally	28.5	5.8	17.0	
Not driving	34.7	20.1	17.0	
Mean hours per week driving	9.9	8.4	11.7	.0014
Main reasons for driving (among drivers)				
To get to school	58.5	76.4	66.1	.0366
To get to work	36.9	45.2	35.2	.6307
Run errands or help with family responsibilities	39.1	37.4	38.8	.9421
Go to clubs, sports practice or other activities	19.4	34.8	26.7	.0441
Go out with friends	30.8	45.0	34.9	.2984
Drive after 11:00 pm	54.9	73.0	66.0	.0033
Have been in a crash as a driver	16.7	21.2	18.6	.5505

say they had been in a crash as a passenger than were rural youth (32 percent); half of suburban youth reported having been in a crash as a passenger.

Family Rules

Parent involvement in adolescents' lives, such as with education, tends to be associated with positive outcomes. We examined parental rules about driving, shown in Table 3. For the most part, urban, suburban, and rural adolescents reported a similar likelihood of having various parental rules. However, rural youth

were less likely than youth in urban or suburban areas to report paying for insurance or for gasoline, while urban youth were less likely than suburban or rural youth to report having to run errands. An item of interest is the last rule on the list, driving with friends in the car. At the time of this survey, adolescent drivers with less than 12 months driving experience were not allowed to transport young passengers unless an adult was in the car. However, very few youth (between 10 and 16 percent, depending on the area) reported that they were not

TABLE 3
Rules About Driving (Percentages)

	<i>Urban</i>	<i>Suburban</i>	<i>Rural</i>	<i>p-value</i>
I have to pay for my own insurance.	24.8	22.2	16.2	.0078
I have to pay for my own gas.	55.6	53.4	47.7	.0447
I have to buy my own car.	17.9	18.2	16.5	.6438
I have to maintain the car.	42.4	51.4	47.4	.2354
I have to run errands.	31.8	39.6	40.7	.0243
I have a curfew.	30.8	46.5	37.3	.1283
I have to drive others around.	14.6	17.0	16.5	.5363
I have to keep my grades up.	42.1	47.9	44.7	.5467
I can't drive with my friends in the car.	15.9	15.1	10.4	.0448

allowed to drive with friends in the car. Urban and suburban youth were somewhat more likely to report this rule than rural youth; it is possible that the difficulty of finding alternative transportation in rural areas may affect parents' willingness or ability to comply with state laws around driving with adolescent passengers in the car.

Risk Behaviors

Adolescents in this survey also reported on risky behaviors around driving, shown in Table 4.

Suburban youth were slightly more likely than urban or rural youth to report having been distracted by a passenger's behavior, while urban youth were least likely to report this, although the significance of the difference was marginal ($p < .10$). Among those who reported having been distracted by a passenger, text describing reasons for the distraction was coded. Some commonly reported reasons included passengers talking or yelling (about half of distracted youth reported this), general fooling around (28 percent), playing music or dancing in the car (about 16 percent), pointing something out (8 percent), accidental distractions such as spilling something (4 percent), and deliberate distractions such as poking or tickling the driver, or moving the rear view mirror (10 percent of distracted youth). There were no significant differences among rural, suburban, or urban youth on reasons for reported distractions.

Youth driving dangerously when they have friends in the car was a commonly reported occurrence among respondents in this sample. Between 51 and 63 percent of youth in each area had been a passenger when a friend was driving dangerously, although this was significantly less common among

urban youth than rural or suburban ones; the more frequent driving with friends reported among the latter two groups could account for the difference in this question. Driving after alcohol use was also more commonly reported among suburban and rural youth (each about 20 percent) than among urban young people (13 percent), confirming previous research; for driving after drug use, the proportion was again smaller for urban youth but the difference was not statistically significant. Substantial fractions of young people reported that they had been a passenger of a driver who had been drinking or using drugs. These differences did not vary across urban, suburban, or rural areas, and indeed was identical in each area (28 percent) for being a passenger of a driver who had been using drugs.

Summary of Differences Across Geographic Areas

Urban, suburban, and rural youth reported many of the same driving experiences and behaviors, but there were some significant differences among the areas.

Demographics varied across the three groups. Urban youth were less likely than youth in other areas to be white and were more likely to attend a low-income school. Suburban youth were more likely to be higher-income and white than rural or urban youth. In many cases rural youth reported behaviors that were intermediate between the suburban and the urban, perhaps reflecting the intermediate socioeconomic status and ethnicity of rural youth relative to the other groups.

Rural youth were generally less likely than urban or suburban youth to report having family rules around driving; it is possible that the greater

TABLE 4
Driving Risk Behaviors (Percentages)

	<i>Urban</i>	<i>Suburban</i>	<i>Rural</i>	<i>p-value</i>
Have been distracted by a passenger's behavior	29.7	41.0	36.5	.0996
Been a passenger when a friend was driving dangerously	51.1	63.0	60.1	.0043
Driven after drinking alcohol	13.4	20.0	19.8	.0399
Driven after using drugs	11.9	16.9	15.9	.1662
Been a passenger of a driver who had been drinking	45.6	35.9	47.7	.7199
Been a passenger of a driver who had been using drugs	28.4	27.6	28.3	.9080

necessity for driving in rural areas reduces the likelihood of parents to restrict a young person's driving

Licensure varied greatly from place to place. Urban youth were much more likely than youth in other areas to have no license or permit, and to be driving without a license or permit. Suburban youth had the highest rates of licensure.

Urban youth drove less than young people in other areas, including reporting fewer hours per week driven and lower probabilities of driving at night or driving to school. Suburban youth were the most likely to report driving to school, work, sports or other activities as well as driving to go out with friends and in the evening.

Risk behaviors varied somewhat across areas. Urban youth were less likely than others to report having driven after alcohol use, having been distracted by passengers while driving, or having been a passenger of a reckless driver. Suburban youth reported higher rates of some risk behaviors: being the passenger of a reckless driver and driving after alcohol use. Rural youth reported the highest rates in this study of having been a passenger of a driver who had been drinking.

DISCUSSION

Urban, suburban, and rural youth in California experience different conditions in their driving, and these varying conditions were associated with some of the differences in behaviors observed in these surveys.

Urban youth were significantly less likely to report having a driver's license or permit than suburban or rural youth, and they reported driving fewer hours. These findings may have several causes. Shorter distances and greater availability of public transportation may mean that urban youth are the least likely to need to drive. In addition, geographic disparities in family income and ability to pay for licensing and insurance are additional factors that likely affect these results. Urban youth in this study were more likely than young people in other areas to attend a school with a high proportion of students receiving free- or reduced-price meals. In addition, the research findings on the greater cognitive load of urban driving could suggest that urban youth may be less interested in driving simply because of the greater challenge of urban driving. This finding may be of

particular interest to schools and driving education programs, as well as law enforcement, in urban areas. Those who work with teens in urban areas on driving issues may not be aware of the extent of unlicensed driving among urban adolescents.

Suburban youth were the most likely of respondents in this study to attend a higher-income school, and the financial costs associated with driving are on the whole less of a barrier to driving for them. Suburban youth were the most likely of the three groups to report driving to school and to other activities, and at night out with friends. The findings on reckless driving with friends and alcohol use among drivers of teen passengers may be of particular interest to parents of suburban young people.

For rural youth, although many are of relatively low incomes, driving is likely more of a necessity, since public transportation is infrequent and distances between home, school and work or other activities can be long. Not surprisingly, rural youth reported the highest number of weekly driving hours, on average. In addition, rural youth were less likely than other young people to report having parental rules around driving; this could also be an outcome of the greater necessity of having young people drive in rural areas. Rural teens more often reported having to run errands, and were less likely to report having to pay for gas or insurance; these data suggest that parents in rural areas are perhaps more likely than other parents to rely on rural adolescents as driving members of the family.

Urban youth appear to drive less than their suburban or rural counterparts, and in some cases this is a protective factor against driving risk behaviors. The lower numbers of urban youth who reported driving or having a license, as well as the lower percentage who reported driving at night, may be a factor in the lower frequency of urban respondents who reported having been a passenger of a friend who was driving dangerously. In addition, it may be a reason for the lower rates of urban youth reporting having driven after drinking alcohol as well as the relatively few who had driven after drug use. The lower frequency of alcohol and drug use among nonwhite youth compared with white adolescents (Wallace, Bachman, O'Malley et al., 2003), could also play a role in these findings, since urban youth were the least likely to be white (just 11 percent of urban respondents were

white) among the three groups.

How can teens become safer drivers? Increasingly states are moving toward adopting graduated driver licensing rules (GDL) that allow teen drivers to practice driving under relatively safer conditions, such as daylight hours and without young passengers in the car, under the supervision of an adult. GDL allows novice drivers to develop their driving skills over time, by incorporating restrictions on driving such as restrictions on hours the driver is allowed to be on the road and restrictions on passengers allowed in the vehicle; some states include additional restrictions such as cellphone use or seatbelt provisions. GDL has been evaluated and demonstrated to be associated with a lower crash rate for new teenage drivers (Shope & Molnar, 2003). California has also recently outlawed talking on cell phones and texting while driving, both of which have been demonstrated to be associated with crashes and may be more common among teenage drivers.

Another solution to preventing teenage crashes could lie with helping peers become positive influences on teen driving (Allen & Brown, 2008). Teen socialization can impact their driving behaviors to the extent that youth who are actively engaged with peer social groups are continually striving to please peers even while driving; teens who are driving with other teens in the car are constantly trying to balance their social status with the peer group with the necessity of paying attention to ensure safety when driving (Allen & Brown, 2008). The current evidence suggests that messaging and media may also play a role in the distractions that teens experience while driving (Henk & Fette, 2009).

Teen driving is also impacted by culture and values to which they are exposed. Young people model the driving behaviors of parents and respond to the rules and guidelines parents employ to structure their teen's driving behavior. Teens whose parents exhibit healthy and appropriate driving behaviors and have those same expectations of their teen drivers tend to be involved in fewer accidents (García-España, Ginsburg, Durbin, Elliott & Winston, 2009).

CONCLUSION

Urban, suburban, and rural youth in this study all reported high-risk driving behaviors, including

driving without a license or permit, driving after alcohol or drug use, and driving with friends in a high risk manner. Risks were not at a uniform prevalence from place to place, but the risks existed at some level in each of the three areas. The high level of unlicensed driving among urban youth – more than one in four urban respondents was driving without a license or permit – was a particular concern identified in these data, and likely associated with the socioeconomic status of urban youth. If enforced by parents, graduated driver licensing rules could help reduce risks for urban, suburban, and rural youth in California. In addition to unlicensed driving, when questioned about rules specific to California's GDL rule, including driving after 11:00 at night and driving with friends in the car, many youth in this survey reported that their parents did not enforce these rules. More education of parents about teen risk behaviors and driving rules through the media might help to reinforce the graduated driver licensing rules which have helped to reduce crash fatalities among young people in California and other states.

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Trying Hard: An Investigation of Youth Engagement and Voice in Community Programs

Shelley Murdock, Carole Paterson, Faye C. H. Lee, and Mary Claire L. Gatmaitan

Many youth organizations have stated missions of fostering youth engagement and voice by involving youth in decision-making. Some successfully meet their goals whereas others seem to try hard but fall short. This qualitative study of eight San Francisco Bay Area organizations looked for those practices that fostered youth decision-making. Evidence gathered suggested that adults' youth development knowledge, their willingness to share power with youth, and sufficient resources are key to fostering youth engagement and voice.

Current research indicates that organizations that foster youth engagement and voice attract diverse youth who achieve greater developmental outcomes than those programs that employ traditional youth development strategies (e.g., CIRCLE Foundation, 2004; Zeldin, Camino, & Mook, 2005). Youth engagement and voice is also widely believed to lead to innovative solutions, stronger communities, and an increased sense of self-worth among participating young people who feel supported by adults rather than controlled by them (National Center for Nonprofit Boards, 2000). Non-formal youth development programs that foster intentional partnerships with adults have become important venues for promoting youth engagement and voice (Zeldin, 2004). Depending on the underlying philosophy and nature of implementation

(e.g., youth development, youth empowerment, civic engagement, and so forth) organizations generally fall on different points of a continuum in fostering youth engagement and voice (Goggin, Powers & Spano, 2002). At one end are those that successfully engage youth in all aspects of the program while the other end represents organizations that provide youth with no power at all. Implementation models also vary. There are some organizations that add one or two young people onto their boards while other organizations create separate youth entities to advise adults.

Salient characteristics of successful youth engagement and voice programs, regardless of program focus or model, include:

- 1) Provide young people with meaningful and authentic experiences (Goggin, Powers & Spano, 2002).
- 2) Facilitate partnerships in which youth and adults contribute equally, learn from one another, and share decision-making power (Fiscus, 2003).
- 3) Infuse or involve youth in innumerable aspects of the program and the organization (Zeldin, McDaniel, Topitzes & Calvert, 2000).

However, gaps seem to exist between “good intentions” at fostering youth voice and engagement and actual outcomes. (e.g., Murdock et al., 2009). This paper shares findings from a study conducted to examine successful practices employed by organizations with a stated mission of providing youth with experiences that foster youth engagement and voice. Specifically, we examined those practices that led not only to youth being “at the table” but also

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having an influential role in affecting organizational and/or public policy decision-making that could lead to improved youth development outcomes.

METHOD

The research team examined eight diverse San Francisco Bay Area organizations, five non-profit and three governmental, with a stated mission of promoting youth engagement and voice (Table 1). The following questions guided the investigation:

- 1) What practices and factors encourage and/or limit an organization's ability to foster youth engagement and voice?
- 2) How do resources such as time, money, personnel, and infrastructure, influence youth engagement and voice?

Sample and Data

We used reputational sampling, seeking organizations that were recommended as using promising practices (Patton, 2002). Telephone interviews were conducted with staff to learn about their programs and the youth served. Results of the phone interviews, along with supporting information, were used to select

organizations for in-depth review. We sought a diverse sample in terms of the types of organizations, youth served, and geographic location. This purposeful (rather than probabilistic) sampling ensured information-rich cases (Creswell, 1998).

All the organizations provided different program contexts (e.g., local government, drug and alcohol abuse prevention, leadership development, and empowerment of students of color and of youth who are gay, lesbian, bisexual, or transgender).

Using a piloted protocol, principal investigators interviewed 12 adult staff (Table 2) individually or in pairs. Staff were asked nine core questions and encouraged to share additional reflections. The interviews were designed to be conversational and the interviewers asked follow-up questions as appropriate.

Youth program participants, ages 13 to 19 (Table 3), were interviewed in groups of four to eight from each organization. Interviews were conducted by a youthful research assistant using a piloted protocol. Participants were treated to refreshments and a \$10 store gift card.

TABLE 1
Programs in the Study

<i>Program Focus</i>	<i>Scope</i>	<i>Funding</i>
1 Develop community leadership among youth	Multi-county	Foundation grants
2 Advise policymakers	City	City government
3 Develop youth employment	City	City government
4 Prevent drug and alcohol abuse	Community	Foundation grants
5 Advise policymakers	City	City government
6 Support gay, lesbian, bisexual and transgender (GLBT) youth and educate public on GLBT issues	Community	Foundation and government grants
7 Promote racial tolerance	6 schools	Foundation grants
8 Develop personal leadership skills among youth	Local chapter of a national organization	Private

TABLE 2
Adult Staff Interviewed

<i>Characteristic</i>	<i>Number</i>	<i>Characteristic</i>	<i>Number</i>
<i>Gender</i>		<i>Education</i>	
Females	8	Some college	1
Males	4	College degree	10
		Post graduate	1
<i>Age</i>		<i>Years in Position</i>	
18 - 30	7	0-5	10
31 - 55	5	5-15	1
		15+	1
<i>Ethnicity</i>		<i>Previous Experience</i>	
White	8	0-5	3
Asian/Pacific Islander	2	5-15	7
Other	2	15+	1
<i>Household Income</i>		<i>Hours Worked Per Week</i>	
> \$30,000	3	0-19	3
\$30-60,000	5	20-29	3
< \$60,000	3	30-39	0
no response	1	40+	6

TABLE 3
Youth Completing Demographic Surveys*

Total	35
<i>Gender</i>	
Males	14
Females	21
<i>Age</i>	
13 - 14	3
15 - 16	16
17 - 18+	16
<i>Ethnicity</i>	
White	12
Asian/Pacific Islander	12
African American	5
Latino	5
Other	1

*Not all youth interviewed completed the survey

Data Analysis

Taped and transcribed interviews were analyzed using qualitative methods of data analysis (LeCompte & Schensul, 1999). Research team members summarized the coded data into recurring themes and included innovative ideas collected from interviewees.

FINDINGS

We do not suggest that the programs were either successes or failures. All seemed to provide something desired or needed by the youth. For the purpose of our study, however, we refer to programs as being successful or more successful if they employ strategies identified in the literature as leading to youth voice and engagement.

For example, a good model of *authentic youth engagement* was a youth commission created by voters in which the youth advocate for legislation on topics such as recreational services, juvenile justice, and public transportation. This same commission provided a strong example of a *youth-adult partnership* because the youth and adults shared equal decision-making power and drew upon one another's strengths. An example of successful *youth infusion* came from an institute in which the youth

are actively involved with nearly every aspect of the organization.

We found three factors present in successful programs which supported authentic youth engagement, youth-adult partnerships and youth infusion: 1) strong staff knowledge and understanding of youth development and youth engagement and voice; 2) staff's willingness to relinquish some power normally held by adults; and 3) adequate resources to provide opportunities for youth engagement and voice.

Staff Knowledge

The staff we interviewed were college educated with varied academic backgrounds. None studied youth development but all demonstrated at least a working knowledge. Programs with staff who seemed most knowledgeable about youth development principles made youth engagement a focus.

Staff in these more successful programs viewed their primary role as providing training and support. They taught youth a wide range of skills including meeting facilitation, public speaking, conducting needs assessments, teaching, writing press releases, accessing elected officials and outreach to other youth. They actively sought authentic opportunities for youth to practice these skills.

This contrasted sharply with the apparent lack of knowledge demonstrated by some organizations' staff. For example, one staff member said they didn't provide youth with advocacy training because "*some of these guys have raging hormones. . . put them in front of the media and they are crazy*".

Programs that were less successful seemed to focus on a philosophy or issue (e.g., multi-cultural awareness or drug and alcohol abuse prevention) rather than youth engagement and voice. For example, a staff person from a multi-cultural awareness program had a college degree in, and passion for, ethnic studies but no formal education or experience in youth development. He thought the program was highly successful. However, the youth indicated that they did not have the same level of decision-making found in more successful programs.

When youth voice and engagement was not the primary program focus, adults seemed to feel so responsible for producing an end-product (e.g.,

teaching other youth about multi-cultural or sexual minority issues) that they did not take the time to teach youth skills or did not trust that youth would produce the same result.

Willingness of Adults

The willingness of adult staff to partner with youth emerged as a critical factor to program success. Whereas all the adult staff seemed to genuinely enjoy the youth with whom they worked, they varied significantly in their perceptions of youths' capabilities.

"(Sometimes) when I'm on an adult board, (people say) 'Oh, you're so knowledgeable for a young person'. It's like saying, 'Oh, you're so knowledgeable for a person of color. . . or you're so knowledgeable for a woman.'" Youth

All adult interviewees claimed to involve youth in decision-making. The programs that most closely matched the ideals described in the research literature employed adult leaders who recognized the capabilities of youth and ensured that youth were involved in decision making at all levels of the program and when possible, the organization.

"Our Board of Directors has young people on it. The external training has young people who lead it. In all areas we have young people . . . from the decision-making process to the planning process." Adult Staff

The amount of program control that adults relinquished varied widely. In one governmental agency the adults planned the agendas and facilitated all the youth meetings. The adult staff members' attitudes about youth's capabilities seemed to guide program control.

" . . . the issues that the Council deals in are complicated and they're really not things that the youth can contribute a lot to." Adult Staff

There were two issues with which all staff, in all organizations, struggled. One was that organizational structure often discouraged youth participation. For

example, staff of one youth-led empowerment program were never able to seat youth on the umbrella organization's board of directors. Other barriers included meeting times that conflicted with school; hundreds of pages of reading material on complex topics; open meeting laws that require advance publicity; liability and insurance issues; and use of jargon. Another issue was the attitude of adults outside the youth program. For example, in one program a youth reported that adults stated that *"they had been through life and they knew what would have to happen to get things done"* resulting in the youth's ideas being ignored.

On other occasions adults professed to support youth voice but succumbed to political pressure: school boards denied youth opportunities to present HIV/AIDS information; principals looked the other way when gay/lesbian support posters were torn down; elected officials quashed a youth-led initiative to mandate gun-locks.

Staff of more successful programs used multiple strategies to improve the chances of youth being heard by adults outside the program and to mitigate logistical barriers. For example, one staff was able to get principals to count youths' participation on the board as independent study. Others identified and linked adult community allies with the youth who appreciated the partnership:

" . . . it was a totally new experience. It was exciting. . . like all the press coming. We were excited because we are actually youth influencing our communities. So, we are making a difference, you know." Youth

There was agreement among all staff that youth engagement programs are hard work. They stated that it is sometimes difficult to be a habitually good role model; to be friendly without being "pals"; to motivate youth without pushing them. They acknowledged that for many tasks, "It would be easier to do it myself," but recognized that doing so would not build leadership and decision-making skills.

Resources

Basic structural and contextual resources were needed by all programs. Youth often noted that staff are the

most important resource.

Resolving logistical issues was crucial to youths' participation. All programs faced transportation challenges, especially those serving young teens not licensed to drive. Meeting schedules often created stress for teens who arrived tired, hungry or worried about completing homework. Staff's sensitivity to these issues helped youth participate more fully. For example, staff and parents sometimes shared transportation duties; refreshments were typically provided; meetings were scheduled at convenient times, etc. Nonetheless, staff acknowledged that it was often challenging.

More successful programs created infrastructures that promoted a sense of family or team membership. There was a balance between formality, such as officers and voting, and informality, such as free-flow discussions that supported a more social atmosphere without losing focus.

Most programs offered workshops, conferences or other learning opportunities not usually available to youth. Other concrete resources, such as name badges, business cards or mentors, varied widely among programs. But all successful programs offered a variety of rich experiences that improved the teens' competencies and increased their sense of participation.

DISCUSSION

Our study suggests successful youth engagement and voice programs depend on three interwoven elements: adequate resources, knowledgeable and committed staff, and willingness to employ strategies, such as youth-adult partnerships, that foster voice. These mirror common themes that have emerged across other research studies (e.g. Camino, 2000; Frank, 2006; Jones & Zeldin, 2008; MacNeil, 2006; Murdock et al., 2009; Norman, 2001; Texas Network of Youth Services, 2002; Zeldin et al., 2000; Zeldin, McDaniel, Topitzes, & Calvert, 2005; Zeldin & MacNeil, 2006; Klindera, Menderwald, & Norman, 2001; Ginwright, 2005).

Adults' underlying perceptions of youth seemed to heavily influence their willingness to partner with youth and provide them with engagement and voice opportunities. Overall, society's view of youth is

often negative, especially regarding behavior and characteristics (Bales, 2001; Bostrom, 2000; Males, 1999). Although teens acknowledge that hard work, honesty, and altruism are important characteristics and their behaviors show this to be true, many adults think of youth as spoiled, irresponsible and lazy (Bostrom, 2000). None of the staff we interviewed voiced these negative perceptions but their unwillingness to relinquish control may suggest this general view to some degree. Some teens in our study attributed some of these negative perceptions to the media and research supports their hypothesis (O'Hare, 2003). Possibly staff have unconsciously applied these perceptions to the youth. Intentional partnerships with adults have been recognized as an important venue for promoting youth in decision-making (Zeldin, 2004) and to favorably increase adults' perceptions of youth (Gambone, Klem, & Connell, 2002) yet this cannot be accomplished unless the adults enter into and support these partnerships.

Since the youth had no basis for comparing their programs with highly successful programs, they seldom complained or made suggestions. In fact, they sometimes excused the adults for adultist attitudes. We suspect that the program met some need, such as a sense of belonging to a group or skill acquisition. If not, they would have voted "with their feet."

Resources alone did not ensure success because several well-funded programs fell short. But all the more successful programs had ample monetary resources. It may be that they were able to offer competitive salaries that attracted well-qualified adult applicants. Related to resources, an important element appeared to be institutionalization. Institutionalization can be important because it frees adult staff from worries about continued funding and allows them to focus on working with youth.

Based on this study, the research literature, and our own work in the field, we believe that a fundamental element of all successful programs is excellent youth development staff, described as "wizards" in McLaughlin and Irby's (1994) book, *Urban Sanctuaries*. We encourage more communication among practitioners to learn from one another and adopt strong practices from other programs.

Shared decision-making is identified as the most salient element in fully realizing authentic youth engagement and voice (Fiscus, 2003). The final element that appeared to be critical in successful programs was adults' willingness to employ strategies, especially youth-adult partnerships, that lead to shared decision-making. Youth-adult partnerships require that adults share power while providing youth with the tools and training to succeed as full partners in the decision-making process (MacNeil, 2000). This process is not the way that adults typically work with young people. A staff person suggested this process requires close critical examination of past practices, unlearning them, and learning new ones.

We acknowledge limitations of our study, including: a limited sample size, our own favorable bias toward youth engagement and voice, and limiting organizations to those believed to be successful. We also recognize the limitations of qualitative research, particularly the potential inability to fully capture the meanings of the spoken words. These limitations may reduce the generalizability of our findings.

CONCLUSION

Promoting youth engagement and voice is an intuitively sensible concept that is well supported by research. The staff we interviewed very much wanted to provide meaningful experiences for youth. To be effective, programs need adequate resources and staff who are committed to fostering strong partnerships with youth. Without these essential elements some programs will continue to try hard but will fall short.

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A Safe Place to Learn and Grow: Fostering Youth Social Skills in Afterschool Programs

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The benefit of afterschool programs in preventing risky behaviors and promoting healthy development in children is well established. Afterschool programs that seek to develop life skills, such as social skills in youth have been shown to improve academic outcomes. How are these life skills developed in out of school contexts? This chapter describes the perspectives of 27 afterschool program practitioners (Program Directors, Site Directors and Line Staff) from five afterschool programs in California on the promising strategies for promoting life skill development in youth. How social life skills that may improve academic outcomes are developed in youth is highlighted in our study.

The benefit of afterschool programs in preventing risky behaviors and promoting healthy development in children is well established (Children Now Report Card, 2004). In recent years, the emphasis on academic standards in K-12 education due to legislation such as the No Child Left Behind Act (Wenning, Herdman, Smith, McMahon & Washington, 2003), has resulted in new opportunities for afterschool programs to demonstrate improved academic outcomes among their participants (Simpkins, 2003). In California, this movement prompted the California Department of Education's After School Education and Safety Program (ASES) to require that programs deliver an educational

and literacy element and an educational enrichment element (California Department of Education, 2008). Consequently, programs funded by California Department of Education responded by implementing tutoring and/or intensified academic focus and reduced the emphasis on overall life skills development in youth (Massachusetts 2020, 2004).

For students who are not doing well academically in school, intensified remedial academic work in afterschool programs such as tutoring has been shown to be less effective in improving academic outcomes than programs that also include life skills development (Massachusetts 2020, 2004). In afterschool programs that develop life skills in youth, increased academic outcomes included improved homework completion and quality, improved grades, higher scores on achievement tests, and reductions in grade retention (Miller, 2003). Similarly, in a review of several afterschool program evaluations, Lauer, Akiba, Apthorp, Snow & Martin-Glenn (2006) concluded that afterschool programs have positive effects on student achievement when they included activities that were both academic and social.

In this chapter, our research on life skills is guided by Dr. Patricia Hendricks' (1998) definition of life skills, where she identified life skills as abilities youth learn that will them to successful in living a productive and satisfying life. Authors also draw on the Search Institute's framework of forty "developmental assets" considered to be positive factors for healthy youth development, which

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complements Hendrick's life skills (Scales & Roehlkepartain, 2003). Using an interpretivist approach researchers conducted a qualitative and exploratory study to answer the following question, namely, how do afterschool providers develop life skills in youth that may promote academic success?

Effective Afterschool Program Practices to Promote Life Skills in Youth

Youth participation in afterschool programs often results in improved student achievement (Huang, 2000, Miller, 2003). One of the contributing factors that support youth's improved academic outcomes is the development of social skills in youth in the context of afterschool programs (Durlak & Weisberg, 2007). Caring relationships among adults, adults and youth, and among youth facilitate the development of social life skills in youth and is also one of the critical elements of effective programs to support academic success (O'Donnell & Michalak, 2002; Cooper, Charlton, Valentine, & Muhlenbruck, 1999; Dworkin, Larson, Hansen, 2003; King, Vidourek, Davis, & McCellan, 2002; Rhodes, 2004; Birmingham et al, 2005; Rieg, 2007).

Careful staff selection of a person that can foster these nurturing relationships may be the single most important factor in providing a consistent nurturing presence in a young person's life (Garnezy, 1991; Miller, 2003; Pianta, 1999; Rutter, 1985; Vandell, Reisner, Brown, Pierce, Dadisman, & Pechman, 1996; Werner, 1993). Selection of staff who have passion, respect and concrete skills for working with young people (American Youth Policy Forum, 2006), influence youth to perceive adults as caring and supportive mentors (Dworkin et al, 2002). Afterschool programs provide special and unique opportunities for peer youth mentoring due to the multiple age groups present. Peer mentors serve as a positive role model for younger youth while providing emotional and social support and academic assistance for the mentee (King et al, 2002).

The literature described thus far provides insights into the importance of adult-youth and peer relationships that develop social skills in youth that may improve academic outcomes. However, questions about how these social skills are developed in youth to improve academic outcomes have not

been adequately addressed. In this chapter, the authors describe how caring relationships with adults and peer mentors in the context of afterschool programs facilitate the development of social life skills in youth that may improve academic outcomes.

METHODS

This study was conducted from May 2005 to June 2006. Interview protocols were approved by the Institutional Review Board of the University of California, Davis. Authors employed reputational sampling to survey afterschool programs to determine which programs placed an emphasis on developing life skills in children that may promote academic outcomes.

Sample

The research team initially mailed a survey to 30 afterschool programs using the networks of Cooperative Extension staff in California. Twenty-six programs responded of which 13 indicated they aimed to improve academics by developing life skills, and expressed an interest in participating in the study.

The authors selected five programs that were representative of the rich programmatic, organizational, structural and geographic diversity in California's afterschool programs to participate in the study. All programs served diverse and low-income children. Two programs represented Afterschool programs from southern California, while three were from northern California. The number of afterschool sites managed by each organization ranged from two to 31, with youth participation ranging from 85 to 3363. Three programs served school aged children, while two sites also provided pre-school care.

The interviews were conducted by three 4-H Youth Development Advisors with the University of California Cooperative Extension, in teams of two interviewers. One interviewer conducted all interviews to provide consistency in the interview method. Authors conducted interviews with five Program Directors, 10 Site Directors and 12 Line Staff. Program Directors' educational background and experience varied including former classroom teacher and assistant superintendent, former nurse with a master's degree in education, a person with

extensive youth development experience, and someone with masters in psychology. Site Directors' range of experience and education was similar to that of Program Directors. Line Staff's education and experience was more varied than the other two groups. Their experiences ranged across computer knowledge, dance, cooking and literacy. One Line Staff was also a school teacher during the day and one Line Staff had been a youth participant in the same afterschool program where she worked.

Data

The selected afterschool programs were asked to provide written documentation about their programs and to self-select two sites that best demonstrated successful practices of bridging life and academic skills. Program Directors were interviewed individually, and group interviews were conducted with Site Directors and Line Staff.

Grounded theory was used as a research framework for this study. Grounded theory involves using multiple stages of data collection and the refinement and the interrelationship of categories of information (Strauss & Corbin, 1990). As a result, each afterschool program employee responded to detailed and specific questions asked of them whose responses and non-verbal communication were hand recorded by the interview team as well as audio recorded and transcribed. After conducting the first two interviews, researchers refined the interview question to better capture the information being sought. Lastly, interviewers prepared a written interview summary that recorded contextual or situational nuances for each interview.

Participant observations were conducted by two authors for 30 minutes at each site, while youth and staff engaged in educational experiences to observe how life skills were developed in youth. While the afterschool programs in this study explicitly stated that one of their program's foci was life skill development in youth with the intention of improving academic outcomes, these programs did not have program evaluations that supported this claim.

Analysis

The research team employed qualitative methods and inductive analysis, as this research was exploratory,

oriented toward discovery, and aimed to capture promising program practices. Grounded theory was used to triangulate the data, "two primary characteristics of this design are the constant comparison of data with emerging categories and theoretical sampling of different groups to maximize the similarities and the differences of information" (Strauss & Corbin in Creswell, 2003, p. 14). The findings were categorized along the primary question addressed by this study. Researchers then returned to the data to assess the most salient examples of strategies afterschool providers used to develop life skills that may promote academic outcomes.

RESULTS

The afterschool programs in this study provided low-income and diverse youth approximately one hour for homework, followed by enrichment activities. Programs emphasized the need to deliver a balanced program between homework, enrichment, physical activity and nutritious snacks.

This section describes the perspectives of afterschool program staff on life skills development in youth. Line Staff described developing positive and healthy relationships as being the most essential life skill to foster in youth. Directors spoke of the importance of hiring the "right" person that was caring and passionate to facilitate the development of relationship building. To foster relationships, staff spoke of the importance of creating a safe place for children to foster a sense of belonging and nurturing relationships. These elements of relationship building will be further explored in the following paragraphs.

A Safe Place to Learn and Grow

During our interviews, afterschool administrators were asked to describe the components of their program they were most proud of. Most administrators indicated that creating a physical and emotionally safe space was one of their top priorities, and talked at great lengths about how they accomplished this. Giving youth a sense of physical safety in an afterschool program involved several practices. This was exemplified in a comment by another staff who stated, "*a place to go, also where they can learn and grow and it's not just babysitting, you know the quality program where they can grow.*"

Program Directors expressed that the process of creating and fostering emotional safety begins with program staff. Staff expressed the importance of creating emotionally safe places for their participants and developing meaningful relationships with children as ways to promote a sense of belonging. Furthermore, directors and staff described their programs' missions as explicitly identifying the creation of safe environments. This was one of the instances where directors and staff articulated and embraced the same essential components of the program. Practitioners described how a safe afterschool environment contributed to improved academic outcomes and stated that creating an environment that is non-threatening, where children feel safe to ask questions and confide in staff about their problems created a place where children can "learn and grow".

Staff Mentoring Youth

Developing nurturing relationships between staff and youth were described by practitioners as an important factor that contributed to improved academic outcomes. Staff readily described how they provided nurturing relationships to youth, yet not all of them could articulate how these relationships may improve academic outcomes. In terms of expressing the importance of relationship building, a Program Director shared that the most important thing they do is develop and strengthen relationships with kids. Afterschool Program Staff *"are someone safe to talk to, it's not mom, it's not the teacher, it's not the Principal, they call me coach...they're in your corner kind of feel. That's kind of what we provide, is that non-threatening person you can talk to provides you with stuff. You know intangible stuff... we connect with kids."* Staff went on to describe that the program provides youth with the opportunity to feel like they belong and further engages them in their environment; while at the same time creating a sense of connection. When pressed on how this sense of connection may improve academic outcomes, staff stated that by virtue of feeling connected to the program, youth learn to express what they need and what they do not understand. A staff person stated: *"...because of the open communication that we have with the kids and that they still let us know what they*

need...they're able to go to the teacher and say I don't understand this. I need this and this. So they are getting their needs met in the classroom."

In a program in southern California, staff explicitly described the connection between the development of social life skills and improved academic outcomes. Staff expressed that once the relationship between staff and youth is established, they were able to coach youth through goal setting and by presenting probing questions that help youth improve academically. Staff coached youth on goal setting for better grades, to graduate from junior high school, and where they want to be in five years. The practice of probing questions was also used at another site in the northern California where staff coached youth by asking questions such as; *"...so how can you do that differently; okay so you didn't get a good grade on the test so what do we need to do to get there; how do we do [it]..."*

Authors consistently observed afterschool providers striving to foster a caring, nurturing adult relationship with youth in their programs in an effort to improve their academic outcomes. At one site researchers visited, afterschool program staff encouraged kids to work hard, to graduate from high school with the promise of attending their graduation. A Line Staff from another site said *"I saw that it [spending one-on-one time] was helping him to feel secure and be able to do things in the classroom"*.

Peer Mentoring

Our analyses identified peer mentoring as one of the conditions for relationship building that promoted life skills development in youth. Authors identified and observed this strategy in all of the afterschool programs, even though the way it manifested itself in programs varied among program sites. One program created a formal structure (i.e. intentional, regular, orderly) to promote peer mentoring, while the rest of the programs offered an informal structure (i.e. casual, non-systematic). One program established a formal interaction between the middle and high school afterschool programs to create an environment that encouraged peer-to-peer mentorship and peer role-modeling. This created an environment where *"the older kids rise to the occasion and they kind of mentor and bring the young ones along and the young*

ones they want to be like the older ones. They're not going to mess with them. They are going to try and emulate those kids so it actually kind of works very well." The informal approach involved using older teens at random to lead activities or to teach younger children. They focused on the importance of positive friendships and peer relationships with the hopes that by having friends who are high achievers kids will avoid gangs, drug use, and be high achievers themselves.

At another site, Line Staff described how group activities encourage group and social interaction among youth that allowed them the opportunity to work together and learn from one another. This person observed that *"when youth work together such as in staging a play, they are able to get ideas from one another; there is an interaction, they have discussions where they can go back and forth with one another, and they also learn to work with others – all of these skills are beneficial for when youth get older and have real jobs where they have to learn to work with others."* The program director shared that teachers have told him that after the kids participated in the afterschool program's play, they came back to class more engaged.

DISCUSSION

In this study authors sought to identify the promising practices that afterschool providers use to develop life skills in youth that may promote academic success. The practice of selecting caring staff that develop a safe learning environment for youth, where staff foster caring relationships among staff and youth, were instrumental in developing social skills in youth that may result in improved academic outcomes.

It is not surprising to find that fostering and cultivating relationships is an integral component of Afterschool programs. It is through these mentoring roles that adults and/or youth fulfill the role of coach, friend, and confidant for youth, which in turn helps to create a sense of belonging and create safe places for youth. (Herrera, Sipe, McClanahan, Abreton, & Pepper, 2000). It is in these nurturing relationships that participating youth increased their sense of belonging in the program and their comfort level that was then applied in the classroom. Developing

organizational structures in programs such as staff selection, mentoring, and relationship building are identified as techniques that foster a sense of belonging in youth that helps them navigate school. (Moore, Bronte-Tinkew & Collins, 2010). It is evident in our analysis that purposeful staff selection was particularly effective in hiring staff capable of intentionally developing and fostering caring relationships with youth.

While Program Directors and administrators stated that their programs did bridge life skill development and academic outcomes, they only provided anecdotal data to support these claims. Some Line Staff were able to explicitly state how social skill development improved academic outcomes by helping children become more engaged in school, learning to ask questions in the classroom and practicing goal setting to improve grades and planning for future education goals. Other staff seemed unsure of the connection between these two programmatic emphases. The varying perspectives from staff on how life skills development is an end in and of itself, versus it is a way to improving academic outcomes describes a possible disconnect in communication and between Directors and Line Staff.

This inconsistent message provided by Directors and Line Staff pertaining to how life skills bridge academic outcomes for youth may also illustrate the disparity between what seems to be program ideals versus actual program implementation. That is to say that the statements provided by Directors could be perceived as the place where the program aims to be whereas the statements provided by the Line Staff describe where the program actually is. Hence, although the Directors speak of intentionality in life skill development to promote academic outcomes, it appears that the level of intentionality among Line Staff is varied and depends primarily on the individual. This brings us back to the importance of careful staff selection.

It would be interesting to explore how and why certain structural and/or programmatic emphasis are either a point of convergence or not among Directors and Staff as they pertain to life skill development in youth to improve academic outcomes. In our study, Staff and Directors agreed that creating a safe place to learn and grow was important for youth, yet as stated

above they did not always agree on the level of intentionality of developing life skills to improve academic outcomes. Exploring these inconsistencies will strengthen programs and improve developmental and academic outcomes for youth.

CONCLUSION

Our study focused on identifying the promising practices that afterschool providers use to develop life skills that may promote academic success. As mentioned in the methods section, researchers trusted that when afterschool programs stated that they focused on life skill development in youth to improve academic outcomes, that their program evaluations would support this statement. However, since authors found no rigorous evidence of this, we cannot infer that the life skill development in these programs lead to improved academic outcomes, instead we offer the perspective of afterschool practitioners on how participating youth do improve academically. Our examination of life skill development across diverse afterschool programs allowed us to elicit the importance of developing organizational structures to foster relationships among staff and youth as a critical element in fostering social life skills in youth.

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Teens as Teachers Enhance Environmental Education and Personal Skills through Service Learning

Marianne Bird and Aarti Subramaniam

This article describes the outcomes of 4-H On the Wild Side, a collaborative project that unites 4-H with schools and afterschool programs to enhance environmental education and expose children to the natural world. Teens—in partnership with adult volunteers—plan and deliver overnight camping experiences to children from low-income communities. Regular evaluations of the program, conducted annually from 2000-2009, investigated whether students learned and had a positive experience. They also examined whether teenagers benefitted from their service learning experience. Consistent outcomes for the program include significant knowledge gain for participants, growth in leadership skills for teen presenters, and a sense of community contribution. Findings reinforce the fact that research based concepts such as experiential learning, teens as teachers and youth adult partnerships together create a strong program that shows positive outcomes for youth from marginalized communities.

Many children today—especially those from urban, economically disadvantaged communities—do not have the opportunity to understand nature through first-hand experience. Yet these children are the stewards of our future and the ecological health of our planet. It is crucial that all children have access to quality environmental education programs that allow them to develop a knowledge and positive attitude toward the environment. What does such a high quality environmental education program look like? This article describes the findings from annual evaluations of 4-H On the Wild Side (OTWS), a weekend outdoor program which engages teens as teachers for elementary school children.

4-H On the Wild Side—The research base

The purpose of 4-H On the Wild Side is two-fold—to expand outdoor learning and wilderness opportunities for elementary youth who would otherwise not likely have access to the natural

environment, and to provide meaningful service learning opportunities for teenagers who plan and present the program.

On the Wild Side emphasizes experiential and inquiry based learning in areas of environmental science, cross age teaching and youth adult partnerships. The authors review each of these concepts in terms of their research base, their relevance to marginal populations of young people, and how they are practiced in the program.

Experiential learning is defined as a process whereby knowledge is created through the transformation of experience (Kolb, 1984). Experiential learning occurs through a direct encounter with the phenomenon being studied rather than just thinking about the phenomena. Components of such learning include concrete experience, observation, reflection, generalization of abstract concepts, and application (Kolb, 1984). Environmental education concepts lend themselves especially well to experiential learning. In OTWS, children have an opportunity to see the Milky Way, explore the lake, listen to frogs at night – and all these provide an essential backdrop to both the cognitive and affective components of learning, namely increased knowledge about, as well as positive value towards, nature. OTWS activities also incorporate inquiry based methodology, another constructivist learning approach where the learner

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is not handed a correct answer but, through an active process, discovers the answer themselves. There is evidence that African American youth and other youth from marginalized communities learn better with inquiry based approaches (Hmelo-Silver, Duncan, & Chinn, 2007).

Cross age teaching, where teenagers instruct younger children, has received merit as a promising strategy for engaging elementary age students. There is evidence that teens can have a positive impact over the knowledge, behavior and attitudes of younger children (Meyer, Nicholson, Danish, Fries & Polk, 2000). Teens are natural role models for younger children who are eager to emulate them (Bandura, 1977). In addition, engaging teens in leadership roles benefits teens as well. Some reported benefits include learning to be more organized, responsible, and involved in positive change in their community (Hoover & Weisenbach, 1999). Teens that volunteer for On the Wild Side are a diverse group, and this also helps build connection with elementary students who are from similar social and ethnic communities.

Youth adult partnerships are relationships between young people and adults where there is mutuality in teaching, learning and action (Zeldin, McDaniel, Topitzes & Lorens, 2001). Young people's voice, influence and decision-making are on par with adults'. In OTWS teens are trained in experiential and inquiry methods and then have full ownership over the planning and decision-making to develop their lessons and activities, supported by adult guidance. Adult staff in the program intentionally practice strategies that characterize effective youth adult partnerships – creating non-hierarchical structures for equal participation of youth and adults, respectful communication and value for young people's contribution to the process, and together building a project to serve an authentic need in the community (Camino, 2000).

4-H On the Wild Side – In practice

Since 2000, teens and adult volunteers have worked in partnership to plan and staff two annual On the Wild Side weekend camping experiences in late May or early June. About 60 4th, 5th, and 6th grade children from the Sacramento area attend each session, coming with their classes or afterschool

programs. Participants rotate through the teen-led activities to learn about different topics like ecosystems, migration, habitat or water properties. Activities may include games, simulations, observations, and exploration. Participants also have the opportunity to paddle a canoe, sing around a campfire, and fall asleep under the stars.

Teen volunteers engage in authentic leadership roles as they plan and implement their program. They select activities from tested environmental curricula and work in teams to plan their lesson, meeting monthly to design the weekend programs. Teaching is new for most of the teens, and prior to camp they participate in a weekend retreat where they have the opportunity to practice their lessons and learn about inquiry-based science. An adult “coach” partners with each team, but teenagers lead the sessions.

Participants arrive by bus Saturday morning. They sleep outside on decks, and teenagers are assigned to each living group (denoted by school site and gender). On Saturday afternoon and Sunday morning participants rotate through six teen-led learning sessions. The evening includes a campfire and evening program, and the participants leave Sunday afternoon.

Participants come from school and afterschool sites, most from the city of Sacramento. A few weeks prior to the camp, program administrators visit the sites to deliver an informational meeting for students, staff and parents attending camp. Participants and their parents see photos of the facility, learn what to expect, and have an opportunity to ask questions. Adults—usually teachers and afterschool program staff—attend camp with their students. Teens and adult volunteers who serve as camp staff are often new to 4-H and have heard about the project in seeking service opportunities.

Since 2000, 4-H OTWS has been evaluated annually to see if it met its objectives, namely, i) participants would show a significant increase in knowledge of environmental concepts, ii) participants would show a positive attitude and enthusiasm for the natural world, iii) teens would show significant change in life skills, leadership and/or sense of contribution to the community, and iv) all participants would enjoy the experience.

In this article, we provide a summary from ten years of annual evaluation of the impact of 4-H OTWS program for the elementary students and teenagers.

METHODS

The sample, data gathered and analysis are described below. The evaluation utilized several methods to inform program practice and measure impact.

Sample

Participants who attended On the Wild Side, from 2000-2009 were included as the sample for evaluation. Teen teachers for three of the years between 2007-2009 (n=44) were assessed as well. Table 1 below provides total campers and teen teacher demographics who attended the program from 2000-2009.

Data

The following data were collected for the annual evaluations.

Pre- and post-test surveys for campers

Once teen staff selected the lessons they would teach, a short multiple choice/short answer test was designed each year to measure what the elementary school students knew about the topics to be presented. Teen

teachers did not see this test; it was constructed based on the lesson plan objectives. The pre-test was given the week prior to camp, the post-test at the close of the program, and the matched pairs compared with paired samples t-tests in SPSS (SPSS, Inc., 1999).

Student journals

Youth kept a journal used for reflection in the teen-led activities and throughout the weekend.

Participant Survey

Elementary school students and adult chaperones who came with them filled out an evaluation of their experience where they rated their experience, shared highlights and suggestions for improvement, and what they had learned.

Survey for teens

From 2007-2009, 44 teen staff members took an anonymous survey at the conclusion of the program to rate on a five-point Likert scale their relationships with adults, their environmental awareness, and their sense of contribution. A retrospective post-test also asked them to assess their leadership skills (making presentations, sharing opinions with peers and adults, organizational skills, working with younger youth) before and after their experience. Open

TABLE 1
Profile of On the Wild Side Participants 2000-2009

	<i>Elementary Students</i> <i>(n=1,181)*</i>		<i>Teen Teachers</i> <i>(n=191)*</i>		<i>Adult Staff and Chaperones</i> <i>(n=328)*</i>	
Ethnicity						
African American	446	38%	15	8%	58	18%
Asian/Pacific Islander	107	9%	52	27%	39	12%
American Indian	26	2%	0	0%	9	3%
Caucasian	291	25%	112	59%	172	52%
Hispanic	306	26%	12	6%	47	14%
Other	5	< 1%	0	0%	3	1%
Gender						
Female	708	60%	141	74%	226	69%
Male	473	40%	50	26%	102	31%

* Totals include duplicates since participants, staff and chaperones may return from year to year.

ended questions on the survey provide qualitative data about the teens' experience.

Focus groups

In 2003 and 2005, evaluators conducted focus groups. A total of 17 teens and 10 adult staff participated in (separate) focus groups to gain a sense of how the youth adult partnership worked, their feelings about the project, and their reflections on their personal growth, if any.

Observations

In 2008 and 2009, the evaluator conducted systematic observations of aspects of the camp experience noting camper, teen and staff behaviors, issues, and practices.

Analysis

For measuring short-term changes in participant knowledge, paired sample t-tests were conducted to test for significant change each year between pre-test and post-test scores. In addition, effect size measures, namely Cohen's *d*, were also calculated. Qualitative data from the journal entries were coded to extract quotes that specifically mentioned learning.

We gauged camper attitudes about the experience through t-tests in retrospective post-pre surveys. In addition, qualitative information from the journals were also coded for engagement.

To assess impact for teens, we analyzed data from retrospective post-pre surveys and tested for significant differences using paired t-tests. We coded qualitative information from the focus group interviews to further assess impact for teens.

RESULTS

The annual evaluations identified the following outcomes for elementary school participants and the teens who teach the program.

Impacts for Elementary Students

The annual evaluations noted the following impact for the camp participants (4th to 6th grade).

Participants gain knowledge about the environment

Each year there was a significant difference in the participant's pre- and post-test scores (Table 2). Effect size measures (Cohen's *d*) show that in five out of the 10 years, there was a large effect ($> .80$); for three of the years there was a moderate effect size (around .5). Only one year showed a small effect (around .2). There were no significant differences in learning by grade level, gender, or whether participants had been to camp before.

Each year, the students' journals reflected learning, especially through direct experience. The following quotes from journaling activities represent the type of reflective observations that elementary students made. They include both affective and cognitive elements

TABLE 2
Mean Pre-test, Post-test, *p*-values and Effect Size from 2000-2009

Year	N	No. of items in test	Pre-test mean	Post-test mean	Significance <i>p</i> -value	Effect Size (Cohen's <i>d</i>)
1999-2000	74	10	4.1	6.0	.001	.84
2000-2001	58	10	5.3	6.3	.001	.23
2001-2002	117	10	4.8	6.0	.001	.32
2002-2003	113	10	6.6	8.3	.001	.81
2003-2004	99	10	5.7	7.3	.001	.94
2004-2005	113	11	6.0	7.9	.001	.41
2005-2006	87	11	5.9	7.8	.001	1.13
2006-2007	98	11	6.1	7.9	.001	.86
2007-2008	114	11	7.9	9.1	.001	0.53
2008-2009	127	11	5.0	6.3	.001	.66

stemming from direct experience.

“I learned about the prey and predator and that a bird is both—they eat worms and we eat them.”

“I learned that mosquitoes were born in water.”

“I learned about the tap root and how it helps stabilize the tree. I like that leaves make food for the tree.”

“You can find a lot of snails in the water. You can find dead skin, snails, frogs, and worms and even frys, which is baby fish that just was born.”

“A madrone tree is smooth and cold.”

“When you cut down trees, you are cutting down an animal’s shelter.”

Such discoveries appear to be born of first-hand observations as participants explore the environment through structured and unstructured activities.

Participants engage with the natural world

For many students, the program creates opportunities to explore and encounter nature in ways they have not before. For each year, an average of 60% of children reported that this was their first outdoor living experience. The end of camp survey and student journals reveal a litany of first-time experiences for children: Seeing bats, sleeping outside, looking for

bugs, paddling a canoe, seeing shooting stars or the Milky Way, swimming in a lake, finding lizards, feeling the campfire, among others.

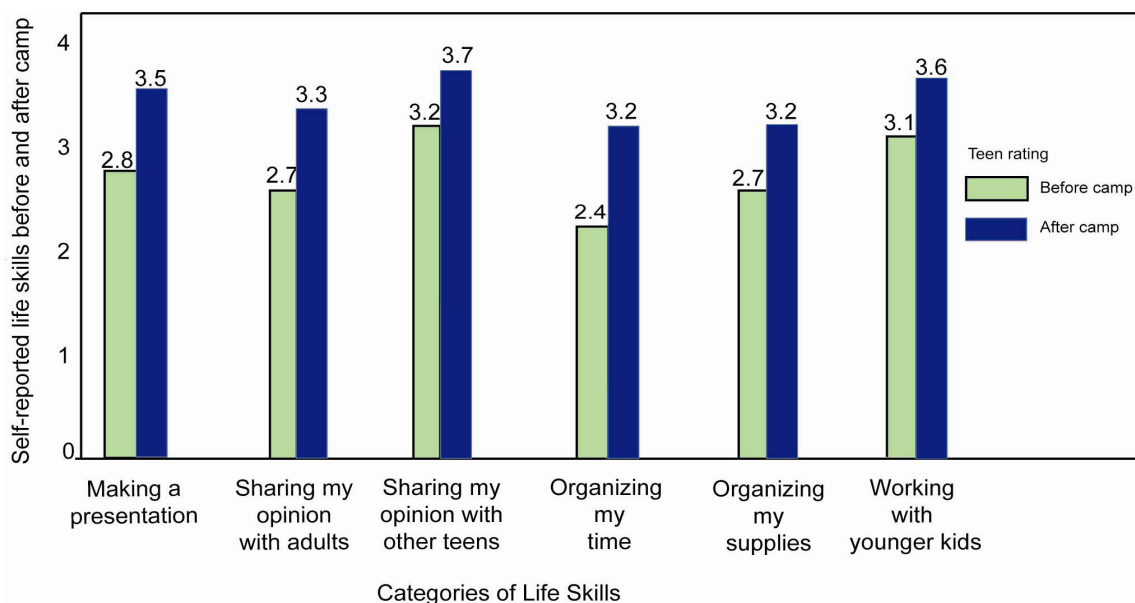
“My favorite thing about Wild Side (camp) was the sleeping because it was beautiful when I looked up at the sky. I saw a million stars and I saw a shooting star. And then in the morning it was nice to hear the birds sing their songs, see the clear blue sky, and feel the fresh, cold air blowing on my face.”

Program planners recognized the importance of a positive experience for participants (both youth and adult), many of whom had never spent the night outside or lived in such a primitive setting. Pre-conceived ideas about wildlife and the woods, fear of tipping the canoe, and unfamiliar sounds and surroundings—all these activities and the environment sometimes pushed participants out of their comfort zone. However, feelings of accomplishment follow mastered challenges, fostering a sense of “I can do it.”

“We had so much fun at canoeing. I think we were the best at backing up. I was with Scott and this boy named Jordan. We had the funnest time. At first we were a little scared. We all were. But I liked it in the end.”

The newness of the experience can raise anxiety

GRAPH 1
Showing Teens Self-reported Life Skills Before and After Camp



for some participants, and not all embraced the rustic environment. However, a majority (an average of 96% for all years) of participants rated their experience as excellent or good. Students repeatedly stated on surveys that the program could be improved by making it longer.

Impacts for Teen Leaders

Evaluators identified several outcomes for teen leaders participating in 4-H On the Wild Side, specifically growth in leadership skills and a sense of contribution to community, among others.

Teens grow in leadership skills

Data from three years of the program indicates that teens self-assessed growth in the following areas: making a presentation, sharing their opinions with adults, sharing their opinions with teens, organizing their time, organizing supplies and working with others. All the categories showed a significant increase at $p < .01$ level.

When teens reflected on how they changed through the experience, four themes arose: personal growth, changes in their perception, a sense of efficacy, and skill development. Over 40% of teens listed gaining tangible skills including working with children and speaking in front of others.

“I’ve become a more responsible, flexible and compassionate leader. Plus, I’ve learned more about nature through teaching than I could have ever learned in a classroom.”

Journal entries and observations verified that each time they taught their lesson, the session improved in content and efficiency, and their confidence as presenters grew.

“I have watched the teens that have stuck with it year after year. I’ve watched them grow in their leadership, in their confidence, and in their communication skills. You know, it’s amazing to me, when I watch them when they’re a freshman, and then if they stay with the program and they’re a senior, how much more confident they are in their skills, and their teaching, and...

everything, their communication, their tone, the projection of their voice.” – Co-director

Teens and their coaches voiced highly positive reflections about their shared partnership. A majority (above 90%) of teens agreed or strongly agreed with the statement, “I think the adults involved in On the Wild Side respect me and support me.”

“When I was planning camp...all the adults that I worked with were willing and open. I gave some idea and took some of theirs. They made me feel welcomed.”

“(The adults) were awesome. They helped us in what they could and gave us ideas. They cheered us on and they listen to us, respected us, and we had fun.”

“I learned that just doing a little goes a long way: listening to the teens...and letting them really take charge of their activity—even though I think it should be done a different way...the response I got was very rewarding.”

Teens feel that they contribute to their community through the project

The project requires a fairly extensive time commitment from its teen and adult staff: four evening meetings, a six-hour training session, a weekend retreat and evening evaluation beyond the weekend-long camp. As a service learning experience, a large majority (99%) of teens felt as though they made an important contribution in their community through the project. The project appeals to youth who have an interest in environmental issues or in working with children.

“I feel like a more important person for having given the kids that opportunity and making everyone’s day. I feel great after every weekend, knowing I’ve helped make memories...”

“I like the focus on biology. I also like that it’s completely for the kids and we’re all volunteers. That it’s completely non-profit and the whole focus of the camp is to teach the kids, not just

about science, but about appreciating nature and having a sense of environmental responsibility.”

Other youth development outcomes

When asked what the most meaningful part of the program was, teens shared many things: learning to teach and working with children, being in an environment that augmented the lessons, feeling good about teaching kids new things. But the most frequently mentioned item was bonding and forming new friendships, both with campers and other staff members. The relationship component of camp ranks high on what teens value about the experience.

“What I like most is the feeling of instant community. Although many people are regulars (on the staff), newcomers feel just as a part of everything as everyone else.”

“Every year I look forward to being able to communicate and relate to them (campers) on a certain level. It’s amazing what kinds of friendships and bonds that can happen in just one weekend.”

DISCUSSION

In this article we presented findings from ten years of annual evaluation. Our findings indicate that 4-H On the Wild Side provides an experience where participants learned environmental concepts, felt more engaged with the natural world, where teen leaders gained life and leadership skills, and all participants (elementary students, teens and adults) report a positive experience overall. This section describes some of the theoretical and practical implications of our findings.

Our findings reinforce that experiential learning, cross age teaching and youth adult partnerships—the research based concepts behind 4-H OTWS—can create positive outcomes for young people at many levels. Both quantitative tests and qualitative journals for elementary students indicate that learning took place at a deeper level than in most traditional learning situations. Not only was the learning in environmental content substantive (based on the medium to large effect size), there is evidence of profound, affective and transformative qualities of learning in the journals of elementary students. This speaks to the true impact

of experiential learning – where the learner is moved not just by facts, but by physical and sensory experiences. Learning happens as the individual discovers information through his or her own inquiry and experience, thus understanding concepts at a deeper level and “owning” what they construct. One might argue that the richest part of On the Wild Side is simply creating a safe, fun environment that encourages exploration. That type of setting should exist not only for young students, but the teens who are also exploring and learning aspects of leadership, community involvement, and relationships. Further study could explore deeper how OTWS creates this supportive space for learning for campers, teen, and adult staff and chaperones as well.

We believe the role of teens as teachers in the program enhances the level of campers’ positive engagement in their learning and involvement at 4-H OTWS. The OTWS evaluations did not gather specific data from campers about their perceptions on the effectiveness of teen teachers. If the program was planned and delivered solely by adults, how would the outcomes for students be different? It is possible that teens model leadership and stewardship and provide younger campers with avenues for thinking about themselves in those roles. Or could it be that teenagers create an environment where elementary students feel emotionally as well as physically safe, leading to greater interaction and the willingness for learners to take risks? A study of resident camps revealed the important role young staff have in making campers feel safe, supported and engaged (American Camp Association, 2006; Bird, et al., 2007). Further study could unearth whether and how teens are more effective as teachers than adults even in short term programs with specific learning goals such as OTWS.

Data from focus groups and the teen survey speak to the power of the teen experience. The commitment is extensive; it is not a one-time, short-term community service opportunity. Their investment—not only time but also ideas and relationships—may create ownership and meaning leading to the high degree of satisfaction they feel about the program and the difference they make in the community. Teens experience personal growth through OTWS as indicated through the teen survey. The evaluations indicate that OTWS is an exemplary

service learning experience as it incorporates both content based learning (environmental knowledge), life skill learning (leadership, communication etc.) and authentic contribution, all in the supportive context, of youth-adult partnerships where young people's ideas are heard and they are able to own their projects.

Our findings reinforce promising practices in the area of youth-adult partnerships (Zeldin, Camino & Mook, 2005). The overwhelming majority of teen and adult staff reported positive working relationships. Several elements seem to contribute to this: i) teens and adults shared a common goal: building and implementing a successful program, ii) the focus for adults was not on developing teens, but on working with teens to address a community issue, iii) youth and adult staff built agreements about how they will work together, iv) the length of the project brought youth/adult teams together over time and allowed individuals to get to know one another and develop friendships, and v) the project integrated youth at all decision-making levels, from fundraising and publicity to kitchen help and clean-up. The camp environment—sharing meals, space, and the natural setting—lends itself to community-building.

CONCLUSION

The case for experiential or project based learning is well documented, and nowhere does there seem to be a better match for providing this type of experience than in afterschool settings. These programs, now common throughout the country, seek to engage young people in constructive activities designed to complement classroom lessons and promote positive youth development outcomes. Like 4-H On the Wild Side, they are informal educational opportunities, unconstrained by school requirements. Learning in these settings can—and some would argue should—be qualitatively different than the formal classroom. This poses the question as to how to make such “in the field” experiences available to students who attend afterschool programs.

We believe that one of the reasons for OTWS success in improving student learning stems from the audience it serves. On the Wild Side draws from low-income and ethnically diverse communities, populations that often lack the breadth of experience

that create a schema to understand and apply information about the natural environment. Learners, many of whom have limited experience in the natural world, have initially less knowledge about concepts germane to that setting, but upon interacting with it, are excited about—and ripe for—learning. This has special relevance as, as a nation, we struggle to produce both future scientists and a citizenry capable of making informed decisions on science-based issues.

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Developing Afterschool Programs for Teens: 4-H Bloco Drum and Dance

Evelyn L. Conklin-Ginop

4-H Bloco Drum and Dance is an afterschool program that teaches adolescents drumming, dancing, and theater arts in the traditions of Brazilian Carnival. Teens learn to express themselves in a variety of modalities and perform at community events. The program was developed by a community coalition that included 4-H, other youth programs, and the school district. Most program participants are Latino, high-risk youth. Program evaluation revealed that 4-H Bloco had positive impacts with regard to cultural appreciation, gang-related attitudes and awareness, health awareness, exercise, and nutrition. 4-H Bloco demonstrates the value of culturally relevant arts education in Extension youth programming.

Afterschool hours, 3:00 pm to 6:00 pm, are the peak time for juvenile crime and risky practices, such as gang activities or alcohol and drug abuse, according to the US Department of Education. This time, while critical, can also represent an opportunity for learning and providing youth with a healthy and safe environment.

Studies indicate that few elementary or middle school youth attend afterschool programs (Brimhall, Reaney, & West, 1999). Although federal government and private foundation funding has increased, research indicates that there are not enough programs available to meet the demand. Further, as youth age, there is much less involvement by middle and high school youth in organized afterschool day care and programs (Alexander, 2003).

When surveyed, nine out of ten Americans believe that teen youth should be involved in positive afterschool programs, and two-thirds acknowledge it is difficult to locate these programs. Due to the results of these studies, there is significant need for expanding the availability of afterschool programs for middle and high school youth. One option worthy of further investigation, and hence, the development and implementation thereof, was the incorporation of music, dance, and drumming programs into middle and high school afterschool programs.

In 2003, a Gallup Poll found that Americans are playing musical instruments at the highest levels since 1978. Ninety-seven percent of the respondents agreed that playing a musical instrument provides a sense of accomplishment and encourages expression. Eighty-five percent believe that playing music makes individuals smarter and research indicates there is a direct correlation between higher math scores among youth who participate in an organized music program.

Other survey results indicated that 97% believed that playing an instrument helped them to appreciate arts and culture, 88% said playing an instrument teaches youth discipline, and 71% believe that teenagers who play an instrument or who are involved in music or dance are less likely to have discipline problems (Cushman, 2005). The study further stated that people who participate in music and the performing arts show more creativity, have a better understanding of themselves and other cultures, and a stronger connection to their communities, regardless of age, income levels or ethnic groups.

4-H Bloco Drum and Dance Program

4-H Bloco Drum and Dance is a program in the Brazilian Carnival tradition that is dedicated to enlivening the life of the community through music, dance, and nutrition education by providing youth the opportunity to raise academic standards, make better food choices, reduce high school drop out rates, discourage gang participation and build a sense of cultural pride. This is accomplished through building

positive self-esteem, embracing personal discipline, developing a commitment to the community and building musical skills.

The 4-H Bloco Drum and Dance afterschool program in Sonoma County targets middle and high school students, between the ages of 12 and 19. This program has been modeled after San Francisco's Loco Bloco (see www.locobloco.org). The Loco Bloco program encourages boys and girls of diverse nationalities and ethnic backgrounds to come together and share their love of music and dance in a safe afterschool environment.

The Loco Bloco program provides two hours of instruction and practice, three times a week in both drumming and dancing. The music embraces both cultural expression and exercise. Additionally, healthy snacks are served to encourage teens to adopt healthy eating habits. The lessons are led by older high school students, along with paid adult staff who serve as mentors by sharing their drum and dance skills with younger teens.

Through the instructional activities, youth are introduced to Afro/Brazilian, Cuban, Hip-Hop and Reggaeton music and dance. Students participating in the instruction of drumming, learn basic concepts and a wide variety of techniques while playing: conga, surdo, repeniquè, Tambo rim, shekere, bells, and djembès. Dance students learn the basic steps of Brazilian music and how the movements relate to the beat of the drums. Following the mastery of these basic steps, they in turn, develop their own dance routines, which tell a story. Both drum and dance students learn about themes, how to develop appropriate choreography, costume design and construction, and mask making.

Once the Drum and Dance skills are mastered, the youth share their skills and knowledge through performances. The performances, due to the theme development, choreography, and costumes, enforce the newly learned music skills, routines, and how to work effectively with other team members to produce the final product, that bring smiles and greater appreciation for percussion, dance and fast paced rhythms to their audiences. By integrating basic music skills and learning to work together as a unit, youth are involved in team building experiences

and cultural appreciation. Students create ownership and awareness of their abilities as they contribute to the process of creating a successful performance by committing themselves to disciplined rehearsals.

Our goal was to build a comprehensive long-term program using the 4 H Youth Development model of experiential education and the San Francisco Loco Bloco model of drum and dance to provide an Afterschool Drum and Dance Program. Program objectives included the following: 1) Through the use of nutritional education and culturally appropriate foods and snacks, participants will be able to identify healthy nutritional snacks; 2) Physical fitness as an activity choice beyond that of sports will reinforce an awareness of the connection between physical fitness and obesity prevention; 3) Through the development, implementation, and extensive collaboration between youth serving agencies, schools and community groups, there will be the successful creation of combined use of facilities and in-kind contributions, services and donations; 4) The creation and promotion of intergenerational programming opportunities to include families will result in long term relationships with caring adults, parents, and grandparents; 5) By focusing on the whole middle school child, and by providing early intervention models of instruction, in the form of dance and music, youth, families and communities will engage in positive lifestyle alternatives.

This paper shares findings from an evaluation conducted between 2005 and 2009 to see whether and how the 4-H Bloco Drum and Dance Program was successful in meeting its goals.

METHOD

The evaluation used a pre-test post-test design for three consecutive years between program year 2005 through 2008.

Sample

Across the three years, 229 youth completed the pre-test and 218 completed the post-test. The ethnicity of program participants was 72% Latino, 14% Caucasian, 7% mixed ethnicity, 3% African-American, 2% Native American, and 2% Asian

or Pacific Islander. Fifty-nine percent came from single-parent homes, and 32% came from immigrant families. Thirty-five percent of the teens reported having a good friend in a gang.

Data

Participants completed questionnaires at the beginning and the end of the year. Questionnaires included items in the interest areas such as importance of learning about cultures, gang-related attitudes and involvement, health awareness, exercise, and nutrition. Questions were designed in a multiple choice format with rating from 0 to number times per week to allow for quantitative comparisons.

Analysis

Change in pre-test and post-test responses were assessed through testing for statistical significance in paired *t*-test scores.

RESULTS

Evaluation results for 4-H Bloco are presented for three program years, (see Figure 1) from 2005-06, 2006-07 through 2008-09 (also see Conklin-Ginop, Braverman, Caruso & Bone, 2011). Percentage gains have been reported here, all of which were statistically significant at $p < .001$ level.

Cultural Appreciation

At pre-test, 50% of teens felt it was important for kids their age to learn what life is like in different cultures, compared with 82% on the post-test. At pre-test, 76% felt it was important to spend time with peers of different races, compared with 94% at post-test.

"In Bloco everyone is family. It don't matter where you come from or what kind of car you drive or if you are cool at school. We are brothers here." Roberto, teen participant (15 years old).

Gang-Related Attitudes and Involvement

When asked whether being in a gang is a good idea for young people, 54% at pre-test reported "definitely

not" or "probably not," compared with 95% at post-test. Eighty percent at pre-test believed that the Bloco project would definitely help them stay out of a gang, compared with 96% at post-test. At pre-test, 72% percent believed that Bloco would definitely help "most kids" stay out of a gang, compared with 92% at post-test.

"We don't talk about gangs in Bloco, we don't need them and we don't want to be part of them either. We have each other!" Lilliana, teen participant (18 years old).

Health Awareness

At pre-test, 28% felt it was definitely important for kids their age to think about their health when deciding what to eat, compared with 54% at post-test.

"I love the dancing. It helps me lose weight and it also helps me feel okay about being a larger girl." Juanita, teen participant (15 years old).

Exercise and Nutrition

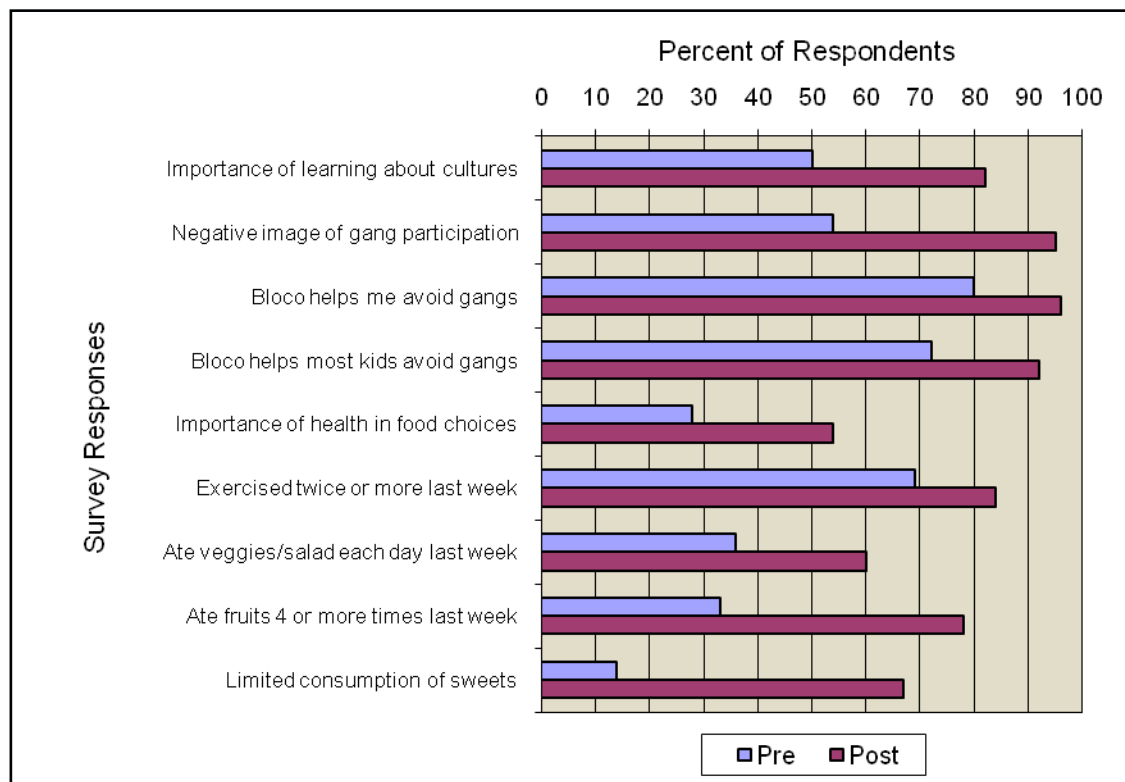
At pre-test, 69% reported exercising outside of school at least two days a week for 20 minutes during the past week (not counting Bloco itself), compared with 84% at post-test. At pre-test, 36% reported eating vegetables or green salad daily during the past week, which increased to 60% at post-test. Also, 33% at pre-test reported eating fruit 4-6 times in the past week, compared with 78% at post-test. Finally, 14% at pre-test reported eating sweets not more than three times in the past week, compared with 67% at post-test.

"We eat snacks before we play cause it takes a lot of energy to drum. We eat granola bars and fruit. We only are allowed to drink water while we practice. I hated it at first cause I used to eat more candy, but now I do better without all that junk!" Juan, teen participant (14 years old).

DISCUSSION

A comparison of the pre-test and post-test surveys revealed that the Bloco program did have a positive

FIGURE 1
Showing Percentage of Respondents



Note: Returning participants are included in the sample for each year.

impact on the participants in regard to exercise, food choices, appreciation of other cultures, feelings about gangs, and awareness of their health. The 4-H Bloco data revealed that the program is a success and that it has had positive impacts on the lives of the participating young people.

The teens' health awareness was certainly affected by the program. After participating in the 4-H Bloco program, more of the teens believed that it was "definitely important" or "probably important" that other youth should consider their health when deciding about what to eat or whether to drink alcohol or smoke. The teens are not only more aware of their health, but they are taking better care of themselves as evidenced by their eating choices and physical activity rates.

At the conclusion of the program, significantly more teens exercised outside of school classes and played team sports. Simply put, the teens were generally more physically active than when they had started the program. In addition to being more physically active,

the teens were also implementing better nutrition practices.

One intended outcome of this program is greater cultural awareness and diversity appreciation. Teens participating in the Bloco program gained a better appreciation of other cultures as more reported that it was "definitely important" or "probably important" for youth their age to learn what life is like in different cultures and to spend time with youth from other cultures within California (Conklin-Ginop, Braverman, Caruso & Bone, 2011).

Another intended outcome of the program is gang prevention. This is a critical issue right now for the young people in Sonoma County. This is validated by the fact that over half of the participating teens reported having a good friend in a gang. When comparing the pre-test and post-test, nearly the same amount of youth (87.5% pre-test and 86.7% post-test) believed that the program would "definitely" or "probably" help them and others stay out of a gang. The fact that so many teens saw Bloco as a gang

alternative in the beginning (before even participating) is powerful. The message is clear: young people see this afterschool program as something that will help them resist gangs, and 93% reported that they did not think they would be involved in a gang in the coming year. Overall, the 4-H Bloco Program is helping teens become more physically active, practice better nutrition, appreciate other cultures, be more aware of their health, and resist gangs.

We believe the 4-H Bloco Drum and Dance was successful because of the following program practices: 1) adult direction with teen input, 2) emphasis on life skills, 3) cooperative learning, 4) engaging atmosphere, and 5) experiential learning methods.

Adult Direction with Teen Input

It is important that teens are a part of the program development implementation, and included in decision making processes. For older teens the Bloco program provides enriching opportunities to develop leadership and decision making skills.

Emphasis on Life Skills

The elements to be learned are key to the success of the instructional component. Youth should not only have the opportunity to learn music, dance, drumming, but also the elements of life skills and performance skills. Life skills are defined as non-academic skills. These skills are knowledge, attitudes and behaviors which people use to master life situations. In the 4-H Bloco Drum and Dance Program, the youth focused on developing life skills. One outcome from learning life skills is high school teens often are a wonderful resource as mentors to younger teens (Todd, 1995).

Cooperative Learning

All participants, whether it is youth, instructors, teen mentors, or other volunteer adults, need to maximize their cooperative efforts, roles and relationships with participants. With cooperative learning, the groups work as teams, and each youth brings different strengths to share with others. This type of team

approach enhances teen learning in the program, and their personal life skills. (Baker, 2008).

Engaging Atmosphere

The atmosphere of the program is fun, educational, as well as inclusive of the established goals and objectives.

Instructional Strategies, Methods, Tools and Techniques are Experiential in Nature

The 4-H Bloco afterschool program includes a series of true life participation learning experiences. To be an “experiential” or “hands-on” learning activity, it involves discussing activities, developing lessons from the activity, and applying the lessons to the real world. It must involve a person or persons doing something and then looking back at it critically.

CONCLUSION

The core of 4-H Bloco’s purpose and programming is the use of the arts as a tool for the empowerment of youth to adopt healthy, active lifestyles; to contribute positively to and serve as leaders in their communities; and to embrace ethnic and cultural diversity. Our program incorporated social, artistic and physical goals, encouraging youth to perceive themselves as direct contributors to their neighborhood’s cultural wellness and social vitality.

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Extending Science Education with Engineering and Technology:

Junk Drawer Robotics Curriculum

Richard Mahacek and Steven Worker

Increasing youth science, engineering, and technological literacy constitutes a continuing challenge in the United States. The 4-H Youth Development Program is helping to address this need with nonformal science, engineering, and technology youth education programs. The article describes the benefits of engineering and technology education, often missed in science, technology, engineering, and mathematics (STEM) education, and highlights the *Junk Drawer Robotics* curriculum. *Junk Drawer Robotics* extends science education into engineering and technology domains using experiential learning, cross-age instruction, and small group learning. Evaluation efforts show promise in helping youth increase their content knowledge in engineering and technology.

The prosperity of the United States relies upon our investment in educating and preparing future scientists and innovators to provide solutions to vexing environmental, economic, and social problems. Momentum for coordinated science, technology, engineering, and mathematics (STEM) education has grown over the past decade. However, even with increased focus, new curricula, and state education standards, K-12 student science and mathematics proficiencies consistently show stagnation (National Academy of Sciences, 2006). In addition, engineering and technology remain the underrepresented domains in STEM educational priorities and curricula.

While the United States is still the undisputed leader in basic and applied research, over the last two decades, youth science and math academic performance have stagnated and in some cases declined (Fleischman, Hopstock, Pelczar, & Shelley, 2010; Gonzales, et al., 2008; National Center for Education Statistics, 2011). While the field of engineering is vital in the modern world, there have

been few studies on engineering proficiencies and no comparisons of US students' engineering knowledge and skills to those of students in other countries. No national engineering education standards exist to help guide school or out-of-school programs, although there is discussion on developing such standards for K-12 schools. The few studies on youth attitudes towards engineering indicate youth are confused about the field, the engineering process, types of engineering professions, and the value of engineers to society (Robinson, Fadali, Carr, & Maddux, 1999; Robinson & Kenny, 2003).

Technology plays a vital role in our society and is a required 21st century skill for those entering today's workforce. Educational technology can enhance the teaching and learning process while technology literacy addresses skills youth need to problem solve, operate, test, and maintain equipment and systems. Few comprehensive studies compare U.S. student understanding of technology processes to those in other countries. U.S. youth spend over seven hours a day consuming media delivered by technological innovations, two-thirds own a cell phone, and over 80% have Internet access at home (Rideout, Foehrer, & Roberts, 2010). However, the mere use of technology devices is not enough for youth to succeed in the workforce. Youth not only need to be consumers of technology, but understand and be able to apply technological processes. Youth tend to have a poor understanding of the characteristics of technology,

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how new innovations influence society, and how technology is created and adapted (Pearson & Young, 2002). Youth need a basic level of technological literacy in order to make decisions and engage in civic debates pertaining to technology.

Why Engineering and Technology?

Science and mathematics, and to some degree, technology, have found a place in formal K-12 education. While engineering education has seen growing interest, structured engineering programs are still rare within K-12 school walls. Both engineering and technology, however, have a vital role in ensuring the prosperity of our nation. Scientific knowledge informs engineering designs while many technological innovations allow for new scientific advances. Science and technology/engineering education can be successfully connected in K-12 educational settings and may have strong synergistic effects. Specifically, fields of engineering and technology contain similar processes and both may benefit greatly from a combined effort and focus on processes that overlap (Wicklein, Smith & Kim, 2009).

A few studies suggest engineering education may improve science and mathematics learning and achievement (Katehi, Pearson, & Feder, 2009). As youth work on an engineering design challenge, this application helps reinforce science and mathematics concepts. Engineering education programs serve to increase awareness of engineering and the work of engineers, understanding and ability of youth to engage in engineering design, and improvement of perceptions towards engineering (Katehi et al., 2009).

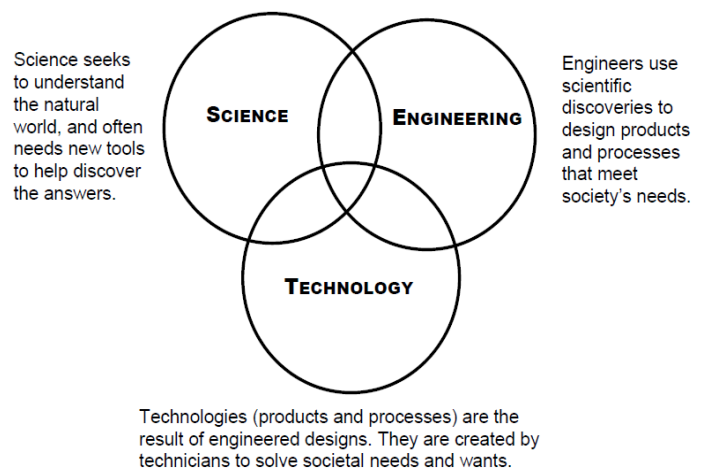
Technology, while encompassing a broad range of concepts and processes, tends to generally be classified into just computer and information technology. However, the processes of innovation, selection, and implementation are important concepts when referring to technological literacy. The argument in favor of technology literacy is similar to that used for science literacy: many of our personal choices and public policy debates center on issues involving technological innovations (which are in turn, based on scientific facts). Everyone needs

a basic level of understanding of technology in order to fully participate in a democratic society (Pearson & Young, 2002). In addition, studies on improving technological literacy suggest learning with technology can improve student's cognitive and affective outcomes (Waxman, Lin & Michko, 2003).

Science, engineering, and technology serve a mutually beneficial arrangement. Scientists use inquiry to investigate the world and generate new knowledge while engineers use these discoveries to design new technologies. Technologists apply the research from scientists and engineers in fabricating, testing, and maintaining systems (Horton, Gogolski, & Warkentien, 2007). As depicted in the Venn diagram below, science, engineering, and technology connect in a natural and overlapping manner as all three provide to and receive from the other realms.

FIGURE 1

The Relationships Among Science, Engineering, and Technology



Courtesy of the Massachusetts Department of Education (2006: 81).

While scientific inquiry and engineering design share similar features, the two approaches diverge in several important aspects. Engineering incorporates the role of constraints, tradeoffs, failure, context, and dependence on iteration. Engineering design is grounded in both the natural and human world, focusing on producing a tool or product. Engineers

must deal with constraints of time, costs, law, and aesthetics – practical boundaries – within their search for a solution. Within the design process, engineers must make choices on trade-offs between functionality, costs, and safety. Solutions must be safe and engineers must factor failure into the design principle. Whereas science strives to be generalizable, engineers must contend with the context of the environment, human needs, and aesthetics. These constraints allow for a myriad of solutions, promoting creativity and new ways of thinking. Science education can bridge with technology and engineering education by connecting science concepts to the real world. By connecting education with the world, education is more appealing to young people (Lewis, 2006).

4-H Youth Development STEM Education

The field of out-of-school-time (OST) programs continues to grow while an emerging body of research suggests OST educational programs can supplement school-based instruction. Structured and properly facilitated nonformal science programs can increase interest, positively influence academic achievement, and lead youth to future career options (Bell, Lewenstein, Shouse, & Feder, 2009). One such program, 4-H Youth Development, offers research-based science, engineering, and technology programming for youth. The 4-H Youth Development Program, a national nonformal youth education organization has engaged youth in science-based programming for over a hundred years. The 4-H positive youth development environment is ideal for science education through emphasis on nonformal learning and learner-centered pedagogies (Russell, 2001). 4-H has an extensive history of providing research-based programming with youth ages five through nineteen, and as such is well positioned to educate young people in science, engineering, and technology.

The UC 4-H Youth Development Program was one of the first to build momentum for nonformal science education. In 1988, Cooperative Extension specialists at UC Berkeley, funded by National Science Foundation, developed a curriculum to address

science literacy programs in nonformal settings. This curriculum, titled *Science Experiences and Resources for Informal Education Settings* (SERIES), was designed to help youth develop competence in science processes (Ponzio, 2006). Over the next decade, multiple science-based curricula were developed for youth ages nine to thirteen on various science content domains. Each curriculum module built knowledge and processes upon each other, building towards advanced concepts. The learning cycle was completed when youth were challenged to complete a service project in their community. Unlike many other 4-H science curricula of the time, SERIES also emphasized science process skills – observing, communicating, comparing, organizing, relating, inferring, and applying. A future outgrowth of SERIES was the *4-H Youth Experiences in Science* (YES) project. Started in 1994 and published in 2000, the YES project added a nonformal science education curriculum for five to eight year olds (Ponzio, Junge, Manglallan, & Smith, 2000).

In 2001, coordinated through the UC ANR Science, Technology, and Environmental Literacy Workgroup, an Action Group was formed to explore prospects for a technology-based curriculum. The action group decided to adapt the successful SERIES model with engineering and technology content and processes. The project focused on robotics and began using the title *S.E.T. Robotics* to highlight science, engineering and technology processes. Robotics was selected as the content domain due to the interdisciplinary connections between scientific principles, engineering design, and technological processes.

As part of the Action Group process, the field of robotics was reviewed and the major systems and elements were identified and defined as topics to be covered in a curriculum. To match the model used in 4-H SERIES, activities on these topics were developed using the learning cycle where there were exploration, concept introduction, and concept application phases. The extension of this model was in adding the engineering and technology process aspects. To do this, the learning cycle was used again as a cycle within a cycle at this next level. Activities were grouped into science based, engineering design

based, and in technology building phases. This allows exploration of new knowledge using a science-based activity, then to take that new knowledge as an introduction via an engineering design activity, and apply using a technology building activity. In addition to this concept of focused activities, testing revolved around the use of various commercial robotics kits or building systems. While the building sets could work for the focused learning activities, the kits did not fully meet the learning objectives of the 4-H SERIES model.

In 2004, the concepts and outline for *S.E.T. Robotics* was presented at the California Industrial Technology Education Association conference. The outcome was a reflection on the concepts and delivery of the SERIES curriculum and refocusing the direction of the *S.E.T. Robotics* on using everyday items in place of commercially packaged robotics kits. With these revisions, the curriculum was retitled *Adventures in Robotics*. The new activities were presented at statewide and regional 4-H workshops with teens and adults which provided opportunities for informal formative data collection.

In 2007, the NPASS (National Partnerships for Afterschool Science) partnership project requested a robotics curriculum fitting the needs of afterschool programming. To provide a more useful delivery in the time allotments of afterschool settings targeted by NPASS, robotics modules were sequenced to allow 45 minute sessions. The overall curriculum activities were sorted and grouped into three subsets on arms, movement, and sensors. The curriculum, with these major revisions in sequence and duration of sessions, was renamed *Ventures in Robotics*. These new modules were tested at NPASS regional conferences and other 4-H workshops for feedback to improve the curriculum.

In 2009, as part of the National 4-H Science Initiative, 4-H National Headquarters brought additional resources to support the development of a comprehensive 4-H robotics curriculum. A multistate collaboration was formed between the University of Nebraska, University of California, University of Idaho, Global Challenge Award (a Vermont-based non-profit organization) and others, to develop the curriculum, *4-H Robotics: Engineering for Today*

and Tomorrow. The California 4-H component, named *Junk Drawer Robotics*, comprises one of three tracks in this national curriculum effort. Curriculum development efforts included refinement, reconfiguration, expansion, and evaluation of the earlier works on robotics. In addition, a youth robotics notebook component was added, modeled after an engineering notebook.

Junk Drawer Robotics

The *Junk Drawer Robotics* curriculum engages youth in understanding scientific concepts and processes, the engineering design process cycle, and technology creation and building. *Junk Drawer Robotics* provides youth these experiences by working with household items to complete simple design challenges. These robotics activities emphasize science, engineering and technology process skills, cross-age instruction, the experiential learning cycle, and small group learning. Activities are designed to be led by an adult or teen facilitator following the experiential learning cycle and promoting inquiry.

Each module contains the desired big ideas (concepts) and key science processes youth should achieve through the activities. Each activity outlines success indicators to help the facilitator ascertain whether youth have grasped these desired outcomes. This framework guided the development process to ensure activities would achieve the desired result and provide the presenter with acceptable evidence. During curriculum development, many activities underwent modifications to ensure the youth were guided to the desired result.

The curriculum incorporates four practices in nonformal educational curricula design: 1) focus on science, engineering, and technology process skills; 2) use of cross age teachers; 3) frame activities in the experiential learning cycle and promote inquiry; and 4) small group learning.

Focus on science, engineering, and technology process skills

Science processes are used to help youth identify, frame, and explore concepts. Youth then apply these in application activities of design and construction.

This application phase helps youth develop critical thinking skills and ensures participants scaffold their knowledge. The youth build towards advanced concepts as they continue to participate in the curriculum. Engineering and technology skills are enhanced when incorporated with communications, teamwork and hands-on activities and include science applications (Wicklein, Smith, & Kim, 2009).

Use of cross age teachers

Junk Drawer Robotics encourages teenagers to facilitate activities with younger youth. Older teens interact with younger learners and work together to explore the big ideas identified in each module. Allowing teens to teach younger youth has been shown to provide benefits for both the teens and younger participants (Lee & Murdock, 2001).

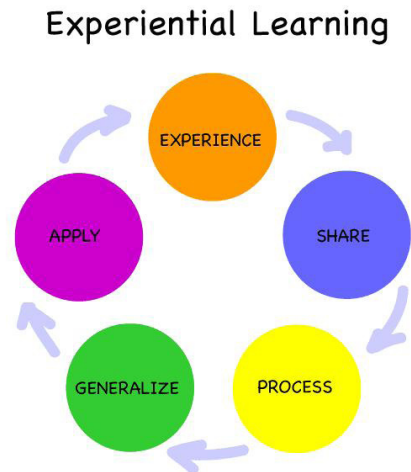
Frame activities in the experiential learning cycle and promote inquiry

The experiential learning cycle is a natural pedagogy to help youth nurture their natural curiosity (Carlson & Maxa, 1998; Kolb, 1984). The model contains five steps: 1) experiencing, 2) sharing, 3) processing, 4) generalizing, and 5) applying. Each activity begins with an experience. After experiencing is complete, presenters help youth reflect on the activity by encouraging sharing and processing with open-ended questions. To complete the learning cycle, each activity contains a generalizing and applying section to help youth connect concepts to both broader robotic concepts and to the real world. In addition, each module (consisting of several activities) also follows the learning cycle, starting with exploration of basic science concepts and processes and moving towards application in design and building activities.

Small group learning

Youth participants learn from each other by working in pairs or small groups. The opportunity for youth to collaborate, share, and work with each other promotes learning while also enhancing life skills in teamwork, communication, and group decision making. When youth work in small groups, they tend to learn more

FIGURE 2
Five-Step Experiential Learning Cycle (Kolb, 1984).



than when working individually (Lou, Abrami, & d'Apollonia, 2001; Robinson, 2005).

Junk Drawer Robotics modules are designed around three phases – to learn (science), to do (engineering), and to make (technology).

- **To Learn (Science):** Exploration – Typically one to three activities within each module. These activities form the foundation upon which youth build conceptual understanding. Youth learn through exploring scientific processes and knowledge with minimal guidance or expectations of accomplishments. This learning phase promotes deeper inquiry, allowing youth to experience, share and process with peers, and start constructing knowledge.
- **To Do (Engineering):** Concept Development – Typically one design activity per module. This activity builds upon the knowledge gained in the exploration phase related to the concepts in the module. Youth are presented with a design problem and relative constraints. In small groups, youth work together to design and plan a solution. This learning phase promotes problem identification, framing, and solving as youth work within the given constraints to engineer a solution to the challenge.
- **To Make (Technology):** Concept Application – Typically one construction activity per module. In building and testing their design from the previous activity, youth solidify and consolidate the concepts and reasoning patterns. In testing their finished

products, youth observe their solutions, find potential sources of failure, and redesign. The iterative process of engineering and technology allows for deeper exploration into concepts.

Each *Junk Drawer Robotics* level contains four to six modules around a central theme packaged in a facilitator's guide. Within a level, each module contains five or more activities. Each level also contains a companion youth robotics notebook used by youth participants to graph, chart, draw, and record data they generate in each activity. The central themes in each level are:

- Level 1: Give Robots a Hand – In this level, youth learn about robot arms and hands. Arms are flexible with joints – shoulders, elbows, and wrists – that allow placement into many positions. The hand with its fingers and thumb can grab, hold, and pick up items. Robot arms allow robots to grab, lift, move, or position items into a machine, to control a spot welder, or to assemble parts for an item. The underlying science concepts include form and function, scientific habits of mind, and leverage. Engineering and technology concepts include the form as a function of task and the role of engineering design.
- Level 2: Robots on the Move – In this level, youth learn about robot movement. Mobile robots are responsible for an array of applications allowing robots to complete tasks in locations and situations impossible for humans. Mobile robots travel to dangerous situations by land, air and water, traverse remote areas or planets, and carry instruments and sensors. The underlying science concepts include friction, basic electrical power and motors, gears systems, and buoyancy. The role of constraints and engineering iteration are emphasized.
- Level 3: Mechatronics – In this level, youth learn about the synergy when mechanical, electronic, and feedback systems are merged. Robots use a variety of sensors to explore the natural world with computer controlled systems interpreting signals. Advanced robots use digital systems and are computer programmed to respond to environmental stimuli. The underlying science concepts include electronic circuits, sensing, and mathematical number systems.

The level includes basic concepts in computer technology including programming, number systems, and flowcharts.

EVALUATION METHODS

The predecessors to *Junk Drawer Robotics* (i.e., *S.E.T. Robotics*, *Adventures in Robotics*, and *Ventures in Robotics*) underwent multiple reviews and revisions. In addition, the 4-H SERIES model was a NSF funded and evaluated project that provided the initial base for adaptation. During the course of years in development these earlier works received feedback from industrial technology educators, youth development professionals, afterschool providers, volunteers, teens, and activity pilot testing in multiple settings. This helped provide a solid base upon which to build the new curriculum modules, activities and notebook. During *Junk Drawer Robotics* development, the curriculum was evaluated using three primary methods: expert review, formative data collection, and an external evaluation field test.

Expert Review

During the development process, *Junk Drawer Robotics* modules were reviewed by a combination of experts, including University engineering professors and students; professional youth development staff in three states; evaluation experts, and blind review conducted by the 4-H National Headquarters. Reviewers provided feedback on areas of strength and suggestions for improvement. In general, review comments were positive about the curriculum's methods and content.

Formative Data

The formative evaluation protocol was designed by an external evaluation team at the University of Nebraska and implemented by academics at the University of California. The evaluation consisted of two evaluation instruments, one for 4-H youth participants and another for 4-H adult or teen presenters. The one-page youth instrument contained Likert-scale questions asking youth to self-report their science,

engineering, technology and mathematics learning and narrative prompts asking youth about what they liked best and thought could be improved. The presenter instrument asked for perceptions of youth engagement and learning. Both instruments contained six Likert scale questions which were converted to interval data based upon the responses of: *1-Strongly Disagree; 2-Disagree; 3-Neutral; 4-Agree; 5-Strongly Agree.*

From fall 2009 through spring 2010, three California counties were involved in pilot testing and provided formative data: Kern, Merced, and Santa Cruz. In each of these three counties, youth were selected based on their participation in either a 4-H Club or afterschool program. In general, the sample consisted of youth from mixed socioeconomic statuses and included youth from Hispanic, Asian, and African American racial groups. A total of approximately 250 youth participated.

In Merced County, eight UC Merced engineering undergraduate students and 4-H staff facilitated weekly activities at 11 local 5th - 8th grade afterschool sites with approximately 20 youth at each site (total of approximately 220 youth). In Santa Cruz County, four 4-H volunteers and teens facilitated activities in two 4-H Club projects twice a month consisting of approximately 10 youth each (total of 20 youth). In Kern County, two teens and a 4-H staff led a countywide 4-H project using the curriculum with approximately 10 youth. None of the sites implemented the entire curriculum, but rather, delivered curriculum modules which were identified as needing additional formative data for their development.

After the activities from a module were delivered, the presenters asked youth participants to complete the evaluation instrument and then complete the form themselves. While most adults and youth completed the survey, a few at each site elected not to complete the instrument. In a few cases, due to programmatic constraints, adults and youth did not complete an entire module, but were still asked to complete the survey evaluating the activities they completed within the module.

RESULTS

The aggregate youth and presenter responses for each

module across all sites are provided in Tables 1, 2 and 3. On average, youth participants and adult presenters responded between 'neutral' and 'agree' that youth learned science, engineering, technology, and mathematics concepts. In Level 1, module 2, focusing on robotic arms, youth participants felt they learned the most about engineering concepts. Youth rated engineering, on average, higher than science and technology concepts.

TABLE 1
Evaluation Results for Junk Drawer Robotics Level 1,
"Give Robots a Hand"

<i>Module 2 Arms</i> <i>Responses for youth participants</i> <i>(n=40)</i>	
<i>Survey questions for youth</i>	<i>Mean Values*</i>
The lesson/activity helped me to learn about science or science concepts.	3.25
The lesson/activity helped me to learn about technology or technology concepts.	3.56
The lesson/activity helped me to learn about engineering or engineering concepts.	3.69
The lesson/activity helped me to learn about mathematics or math concepts.	3.62
I found the lesson or activity to be interesting.	3.55
I would tell my friends that the activity was a good one.	3.36

**Means are from Likert response values: 1-Strongly Disagree; 2-Disagree; 3-Neutral; 4-Agree; 5-Strongly Agree*

(Note: Data from Level 1, Modules 1 and 3 are not presented in the table. These modules underwent substantial modification after being delivered, in part from the results of the formative data, hence the collected formative data for these modules is only applicable to the earlier versions. All other modules underwent minor revisions.)

In Level 2, robotic movement, modules 1 through 4, youth participants tended to respond with higher levels of engineering learning, on average. However, in Module 2, magnets and motors, youth participants also felt they learned about science concepts. Adult facilitators generally rated their perception of youth learning higher than the youth themselves, yet followed the same trend of rating engineering education higher than the other three subjects.

TABLE 2
Evaluation results for Junk Drawer Robotics Level 2, "Robots on the Move"

<i>Level 2, "Robots on the Move"</i>	<i>Module 1 Friction</i>	<i>Module 2 Magnets & Motors</i>	<i>Module 3 Gears</i>	<i>Module 4 Underwater ROV</i>
	Responses for youth participants			
	n=53	n=72	n=31	n=72
<i>Survey questions for youth</i>			<i>Mean Values*</i>	
The lesson/activity helped me to learn about science or science concepts.	3.00	4.01	3.61	3.81
The lesson/activity helped me to learn about technology or technology concepts.	3.32	3.93	3.77	3.48
The lesson/activity helped me to learn about engineering or engineering concepts.	3.34	3.86	3.94	3.97
The lesson/activity helped me to learn about mathematics or math concepts.	2.81	3.37	3.55	2.99
I found the lesson or activity to be interesting.	3.37	4.26	3.97	4.08
I would tell my friends that the activity was a good one.	3.00	4.28	3.61	3.93
	Responses for adult presenters			
		n=12	n=12	n=7
<i>Survey questions for adults</i>			<i>Mean Values*</i>	
The lesson/activity helped youth to learn about science or science concepts.		4.00	3.50	4.29
The lesson/activity helped youth to learn about technology or technology concepts.		4.17	4.08	3.86
The lesson/activity helped youth to learn about engineering or engineering concepts.		4.25	4.33	4.29
The lesson/activity helped youth to learn about mathematics or math concepts.		2.91	3.75	3.14
I found the lesson or activity to be interesting to youth.		4.33	3.91	4.00
The lesson/activity was engaging to youth.		4.42	3.92	4.00

*Means are from Likert response values: 1-Strongly Disagree; 2-Disagree; 3-Neutral; 4-Agree; 5-Strongly Agree

(Note: Data from presenters for Level 2, Module 1 is not included in the table due to program factors at those particular sites when activities in this module were being implemented.)

Module 2 received higher responses from both youth and adults rating the activity as "interesting" and "a good one." This echoes anecdotal evidence from observations of youth participating, as the To Do and To Make activities, titled "Can-Can Robot" allowed for creativity, artistry, and were visually appealing.

In Level 3, merging of electronics and mechanics, youth participants tended to rate technology education higher than science or engineering. This fits as the third level incorporates elements of circuits, sensors, and computer programming into the

curriculum. However, responses to the curriculum being "interesting" and "good" are lower than those from the other Levels. This may be due to the more abstract nature of the concepts presented, including basic computer programming and mathematical numbering systems (e.g., binary). To help youth learn about these complex concepts, many of the activities are group scenarios which attempt to provide analogies and do not contain direct hands-on building activities found in Levels 1 and 2.

In almost all cases, both youth and adult facilitators

TABLE 3
Evaluation results for Junk Drawer Robotics Level 3, “Mechatronics”

<i>Level 3, “Mechatronics”</i>	<i>Module 1 Circuits</i>	<i>Module 2 Sensors</i>	<i>Module 3 Logical Operators</i>
	Responses for youth participants		
	n=163	n=10	n=21
<i>Survey questions for youth</i>	<i>Mean Values*</i>		
The lesson/activity helped me to learn about science or science concepts.	3.31	2.67	2.62
The lesson/activity helped me to learn about technology or technology concepts.	3.33	2.80	2.80
The lesson/activity helped me to learn about engineering or engineering concepts.	3.13	2.50	2.57
The lesson/activity helped me to learn about mathematics or math concepts.	2.83	2.40	2.75
I found the lesson or activity to be interesting.	3.35	2.70	2.52
I would tell my friends that the activity was a good one.	2.95	2.40	2.24
	Responses for adult presenters		
	n=14	n=2	n=3
<i>Survey questions for adults</i>	<i>Mean Values*</i>		
The lesson/activity helped youth to learn about science or science concepts.	3.93	4.00	3.00
The lesson/activity helped youth to learn about technology or technology concepts.	4.14	4.50	3.33
The lesson/activity helped youth to learn about engineering or engineering concepts.	3.86	4.50	2.67
The lesson/activity helped youth to learn about mathematics or math concepts.	2.79	2.50	3.33
I found the lesson or activity to be interesting to youth.	3.71	4.00	3.00
The lesson/activity was engaging to youth.	4.00	3.00	3.00

**Means are from Likert response values: 1-Strongly Disagree; 2-Disagree; 3-Neutral; 4-Agree; 5-Strongly Agree*

rated mathematics learning lower than science or engineering. This is to be expected as the curriculum does not emphasize mathematics education. For engaging youth interest, adult presenters tended to rate their perception of youth interest higher than the youth participants themselves. However, both tended to rate their interest in the activities moderately, with notable exceptions in Level 3, modules 2 and 3. Both of these modules tend to rely on group activities rather than building and constructing.

Overall, the formative data seem to indicate the curriculum was well received by adult facilitators in establishing a productive learning environment for science, engineering, and technology. These Likert responses, along with the open-ended comments (not included here) pertain to the draft modules during the development process. As part of the curriculum development, the open-ended responses

on the formative evaluation instruments were used to improve and strengthen activities.

External Evaluation Field Test

In addition to the formative evaluation results presented above, an evaluation field test was conducted in July 2010 at a four-day summer camp program by evaluators in Nebraska (Grandgenett, 2010). Adult presenters who were not previously involved with curriculum development delivered *Junk Drawer Robotics* to 15 youth members. The research methodology contained two strategies: 1) a pre-test, implementation, and post-test design, using two evaluation instruments: a 33-question Likert scale attitude survey and an open-ended content instrument; and 2) a feedback form similar to the instrument used in the formative data collection.

The attitude assessment did not find a statistically significant improvement in youth attitudes around science, mathematics, and learning. Though, this may have been due to the youth participants self-reporting relatively high on both the pre-test and post-test.

The content instrument examined “big ideas” within science and engineering with broad questions, allowing a variety of responses. The external evaluation team analyzed and scored responses based on whether the youth illustrated a deeper understanding from pretest to posttest. Findings showed a deeper understanding around STEM, especially pertaining to the definition of robots. For example, youth showed a deeper understanding on three items emphasized in the curriculum: “what is a robot” (46.6% of participants improved their knowledge), “how are robots used in real life” (33.3% of participants), and “what is a computer program” (33.3% of participants). There was not much improved understanding in “what is mathematics” (6.6%); however, while mathematics is included in some activities, it is not a focus in *Junk Drawer Robotics*.

The feedback form was completed by youth participants after each module was completed. The instrument contained six Likert scale questions which were aggregated based upon the responses of: 1-Strongly Disagree; 2-Disagree; 3-Neutral; 4-Agree; 5-Strongly Agree. In both the youth and presenter feedback forms, the means for all questions tended towards the positive “agree” side. Presenters rated a little higher than the youth reported values (a range of 3.41 to 4.18 for youth and a range of 3.33 to 4.53 for presenters). The lowest means pertained to mathematics. Youth interest and engagement were rated highest by both groups on the 5 point scale (4.04 and 4.18 for youth and 4.44 and 4.53 for presenters). Overall, the results were positive for learning around science, engineering, and technology and excitement for the activities.

DISCUSSION

While not as prominent as science and math, and sometimes called the missing T and E in STEM,

engineering and technology can be successfully added to out of school time nonformal science curriculum. The *Junk Drawer Robotics* curriculum shows promise in engaging youth in engineering and technology within a science framework. As illustrated earlier in this chapter, science, engineering, and technology overlap in mutually beneficial ways. The use of robots as the focal point provides a natural relationship for learning in these three domains.

Over the past 12 years, 4-H educators from various organizations have utilized earlier versions of what has become *Junk Drawer Robotics*. Anecdotal comments from these educators were overwhelmingly positive, and voiced desire for the revised and published curriculum.

Evaluation data collected for the *Junk Drawer Robotics* curriculum demonstrate gains in content knowledge around engineering and robots. These findings confirm other research on using robots in engineering and technology education and suggest hands-on robotics activities engage youth and increase science knowledge. These positive outcomes confirm the benefits of the *Junk Drawer Robotics* curricular structure, focus on process skills, activity framing in the experiential learning model, emphasis on small group learning, and the use of teenagers as presenters.

Junk Drawer Robotics curriculum may benefit from additional outcome evaluation with a larger sample (the Nebraska outcome evaluation only had 15 youth participants). Other evaluation avenues to explore may be looking at the influence of utilizing teenagers as teachers versus adult facilitators; application of concepts to the real world; and the effectiveness of curricular structure into three separate types of science (to learn), engineering (to do), and technology (to make). In addition, the evaluation efforts conducted thus far have not included the recent addition of a youth notebook. During the development process, adult educators identified the need for a place for youth to record their observations, complete their design drawings, and combine handouts into one place. The youth notebook may improve both SET understanding and language literacy. Future evaluation work could follow youth as they progress in the curriculum to determine if engineering skills of drafting, drawing, and designing improve.

CONCLUSIONS

The United States relies on scientific research and technological innovation to sustain its way of life. There has not been consistent emphasis on engineering and technology education, even with a national focus on STEM in formal education. However, there is a growing trend to include more engineering and technology in STEM education, as evidenced by the report *Engineering in K-12 Education* and the 2010 addition of “Engineering” to the *International Technology and Engineering Educators Association’s* name. The theme of robotics utilizes the engineering design process while also engaging youth in science and technology, improving problem solving abilities, and increasing visibility of engineering careers. The University of California 4-H Youth Development Program is one of the leaders in nonformal science, engineering, and technology education. Starting with the SERIES curriculum, a set of process-focused science literacy curricula, the later expansion with YES for younger children, now *Junk Drawer Robotics* extends into engineering and technology processes and concepts. *Junk Drawer Robotics* moves forward youth science, engineering, and technology educational efforts.

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Insights from an Evaluation of a Healthy Living Project

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A case study about three approaches to evaluate a 4-H Healthy Living Project is presented and discussed. The new *Healthalicious Cooking* curriculum focuses on hands-on cooking and physical activities as vehicles to promote a healthy lifestyle. To evaluate the program, the youth completed: (1) a nutrition behavior and knowledge survey; (2) a food photo journal; and (3) a “Quick Write” (QW) reflection activity. The program resulted in limited yet positive changes in knowledge and behavior, but further development of evaluation methods based on qualitative findings will guide future efforts. This paper addresses the uses and limitations of these different methods.

Over the past three decades, childhood obesity has emerged as a serious health problem, particularly in some minority groups. Among 6-11 year olds in 2007-08, Mexican American boys and African American girls had the highest rates of overweight or obesity, at 44.0% and 38.9% respectively, with the overall national rate at 35.5% (Ogden, Carroll, Curtin, Lamb, & Flegal, 2010). In recognition of the severity and implications of childhood obesity, First Lady Michelle Obama has adopted a national initiative to combat this problem, entitled “Let’s Move” (Office of the First Lady, 2010) (www.letsmove.gov).

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Childhood obesity results from an imbalance of energy intake and expenditure and is influenced by genetic, behavioral, and environmental factors. In the face of a genetic predisposition to obesity, environmental factors may either enhance or reduce the genetic effects on obesity (Bouchard, 2009). In the Avon Longitudinal Study, the intake of an energy-dense, low fiber, high fat diet at ages five to seven years was associated with greater odds of excess adiposity at age nine (Johnson, Mander, Jones, Emmett, & Jebb, 2008). Some factors that are potentially modifiable by afterschool and school-based interventions include food and beverage intake, physical activity, and adult-child interactions around food. A meta-analysis of seven school-based nutrition intervention programs, including a study from California, reported a net relative increase (intervention minus control group change) of 18% in fruit and vegetable consumption (Howerton, et al., 2007). However, the effects on reducing childhood obesity were not evaluated in that study. A two-year follow-up of a childhood obesity prevention program in Australia reported positive outcomes from a relatively simple approach that attempted to reduce sweetened beverage consumption and increase fruit and vegetable intake and physical activity (Taylor, et al., 2007). Positive outcomes included reduced consumption of sweetened beverages, greater fruit intake, and, among intervention children who were not initially overweight, a lower mean body mass index z-score. However, a meta-analysis of 18 school-based physical activity interventions found no

significant effect on improving body mass index of participants (Harris, Kuramoto, Schulzer, & Retallack, 2009). The authors suggest that obesity prevention in children may require multiple intervention components. For example, both dietary and physical activity should be incorporated to be successful in reducing or preventing obesity.

Nutrition interventions that target youth only—but not their families—may also have limited impact (Hyland, Stacy, Adamson, & Moynihan, 2006). In the treatment of childhood obesity, family-centered approaches have mutual benefits for children and parents. A 10-year follow-up of a randomized controlled trial found that overweight children, treated in a parent and child program, maintained a healthier weight status than those who participated independently without their parents, or the controls who received no intervention (Epstein, 1996). Even though family-centered programs may be conducted primarily to treat the children, research shows that parents also reduce their risk of cardiovascular disease after participating in these programs (Golan, Weizman, & Fainaru, 1999). A randomly controlled clinical trial found that fathers of obese children significantly reduced body weight, fasting glucose and triglycerides at a 12 month follow-up after participating in a child obesity treatment program, compared to fathers whose children were treated by a child-centered approach.

In a 2006 report, the Institute of Medicine (IOM) recommended that childhood obesity prevention should include efforts at the family and community levels, as well as at the school, industry, and government levels (Koplan & the Institute of Medicine (U.S.) Committee on Progress in Preventing Childhood Obesity, 2007). It was also stressed that efforts to improve nutritional behavior evaluation methods should be strengthened on all fronts to assess the progress of prevention efforts and possibly refine or improve intervention strategies.

Many different evaluation methods have been used to measure how effective a nutrition education program is at producing desired outcomes (Contento, Randell, & Basch, 2002). The use of questionnaires to measure changes in knowledge is the most commonly utilized evaluation method, particularly in school-

aged children. This approach is based on the premise that a change in knowledge will lead to changes in attitude and then in behavior. This premise has been questioned, leading to more theory-driven approaches to nutrition education that help educators understand what works to change behaviors and why. Using a theory-driven approach often requires measuring change in psychosocial variables such as self-efficacy and perceived social support that mediate behavior change. For a short-term intervention, assessing changes in knowledge and psychosocial variables may be most appropriate. However, many stakeholders demand evidence of impact on at least dietary behaviors, if not documented physiologic and/or anthropometric changes. To assess dietary behavior, 24 hour recalls, direct observation (i.e., plate waste studies), self-reported food frequency questionnaires, and diet records are commonly used. Contento and colleagues emphasize the importance of choosing evaluation methods that are appropriate for the objectives, duration and intensity of the program, as well as the audience.

The 4-H Healthy Living Project

The 4-H Healthy Living Mission Mandate Update published in 2009 called for programming that would address America's critical health issues by improving nutrition and physical activity of program participants. The importance of evidence-based programs for greater effectiveness was stressed in this call. The purpose of this paper is to examine the uses and limitations of three approaches to evaluating a 4-H Youth Development nutrition and healthy living project. This nutrition and healthy living project included nutrition education, physical activity, and food preparation skill-building to enable youth to develop healthier lifestyle habits. Research has shown that consumption of high-fat foods and sweetened beverages and eating food away from the home are associated with obesity (Ritchie et al., 2007). Our nutrition and healthy living project, based on the Social Cognitive Theory (Baranowski, Perry, & Parcel, 2002), was designed to reinforce and build upon nutrition education that these students may be receiving in their regular classrooms by providing

specific skill building in food preparation and menu planning. Parents and guardians were also invited to celebrate the successes with their children at the last session. Since we were conducting a pilot study, we included two quantitative evaluation methods to measure knowledge and behavior change through pre-post tests, a food photo journal, and a qualitative method to capture psychosocial variables that may play a role in mediating behavior change.

METHOD

Program Description

The University of California Cooperative Extension (UCCE) Health Promotion workgroup developed a healthy lifestyle curriculum for families with school-aged children. This project, funded by a University of California Core Issues Grant, examined the effectiveness of two delivery methods on a healthy lifestyle intervention for youth. The protocol for the study was approved by the UC Davis Institutional Review Board. Parents signed informed consent forms. Specifically, we examined whether a family-based approach (youth-adult) produces more favorable outcomes than a youth-only approach. The program was offered to eight groups in two California counties, one urban (Contra Costa County)

and one rural (Amador County), and each group was randomly assigned as youth/adult or youth-only. In the youth/adult group, at least one parent of each youth was asked to attend the six classes. All parents in both groups were invited to the final celebration class. The participants were recruited through the 4-H Youth Development Program, schools, community organizations, and by newspaper announcements. The classes included children aged 6-14 years (mean=9.9 years) and their family members. The volunteer participants attended six weekly sessions that were each two hours in length. Session activities included a physically active game, hands-on cooking, shared mealtime, a nutrition activity, and a “Quick Write” (QW) reflection (see Table 1).

Program Evaluation

Youth participants (n=82) (Table 2) completed a four item survey evaluating personal nutrition behaviors at the first and last (sixth) sessions; some later participants filled out a modified, 9-item survey with additional knowledge questions. At least six weeks elapsed between the pre- and post- surveys. These questions were compiled and adapted from extension tools used elsewhere in the state and nation (California Department of Education, 2001; Jensen et al., 2004). Youth were also asked to complete

TABLE 1
Nutrition Messages and Sample Activities from Healthalicious Cooking

<i>Lesson</i>	<i>Nutrition Messages</i>	<i>Cooking Activity</i>
1	Food Safety: Youth learn how to wash hands properly and why it is important to wash them after using the bathroom and before handling food or eating.	Pizza with vegetable toppings and whole wheat crust
2	MyPyramid: Youth learn about MyPyramid through a grocery bag sorting activity and why it is important to eat a variety of foods each day.	Stir-fry with chicken, vegetables, and brown rice
3	Whole Grains: Youth learn how to identify whole grains and why it is important to eat them.	Scrambled eggs with whole grain English muffins
4	Colorful Fruits and Vegetables: Youth learn how to use color to choose fruits and vegetables and why it is important to eat a wide variety of fruits and vegetables.	Healthy version of soft tacos
5	Menu Planning: Youth learn how to plan a balanced meal using MyPyramid. This meal is prepared at the very last class.	Spaghetti, salad and fruit
6	Celebration: At the last session, the youth prepare a meal that was planned at lesson 5 and share it with their families. During the meal, they engage in a conversation starter activity designed to make family meals more enjoyable.	Meal that was planned at lesson 5

All of the lessons also include an active game, such as badminton, jump-rope, or hula hoops, to reinforce the role of physical activity in promoting health, reflection, and other activities that are used to support behavior change.

a food photo journal at home for one week at the beginning (week 1) and end of the project (after the 5th lesson). This involved asking the youth to use a disposable camera to photograph their evening meals and briefly write about it in a log. The last activity in each session was to complete a QW reflection. This involved briefly writing five things that they liked, learned, and/or noticed during the session.

Data Analysis

Pre-post differences in the survey responses were analyzed using Analysis of Variance (ANOVA) at the 95% confidence level using SAS® software, (Version 9.2, 2008, SAS Institute Inc, Cary, NC). A nutrition graduate student examined the photographs for a change in the presence (whether or not vegetables were included) and variety (how many different types) of vegetables during the evening meal. Vegetables were coded in accordance with the MyPyramid classifications (USDA, 2005). It was noted how many different vegetables were present in each meal and a paired t-test was used at the 95% confidence level to assess differences between the first and last sessions. The presence and variety of vegetables at dinner was also analyzed to determine how well the values correlated with the responses to the questions on the survey (see Table 3 and 4 for exact questions.)

Using a constant comparative analysis approach (Corbin & Strauss, 2008), three observers, in addition to the graduate student, coded and sorted the QWs into categories. NVivo® software (Version 8, 2008, QSR International Pty. Ltd.) was used to assist in coding and sorting the data. Agreement between each observer and the graduate student was calculated. Within each category, the graduate student noted the frequency of mentioning items and emerging themes.

RESULTS

Pre-post Surveys

Both groups, youth-only and youth/adult, had similar characteristics at baseline (Table 2). There were 10 youth who did not complete the classes and/or fill out a post-survey, but were included in the analysis as intent to treat (that is, their post-scores were set equal to their pre-scores). More children in the youth/adult classes reported having helped plan or prepare a meal in the past week compared to the youth-only group ($p=0.027$). However, the two groups were not similar at baseline in this behavior; specifically, there was more room for improvement in the youth-adult group. For all other variables, no differences in youth nutrition knowledge and behavior change were found between the two methods of program delivery. Therefore, the data for the two groups were combined

TABLE 2
Youth Characteristics

	<i>All Youth (n=82)</i>	<i>Youth Only (n=44)</i>	<i>Youth-Adult (n= 38)</i>	<i>p-value*</i>
<i>Gender % (n) Female</i>	74.4 (61)	72.7 (32)	76.3 (29)	0.71
<i>Age (mean ± S.D.)</i>	9.9 ± 2.5	10.2 ± 2.5	9.6 ± 2.4	0.39
<i>Grade (mean ± S.D.)</i>	4.6 ± 2.5	4.8 ± 2.5	4.3 ± 2.5	0.42
<i>Ethnicity/Race % (n)</i>	NA	NA	NA	0.85
White/non-Hispanic	64.6 (53)	70.5 (31)	57.9 (22)	NA
Latino/Hispanic	13.4 (11)	11.4 (5)	15.8 (6)	NA
African American	1.2 (1)	0	2.6 (1)	NA
Asian American	9.8 (8)	2.3 (1)	18.4 (7)	NA
American Indian	1.2 (1)	2.3 (1)	0	NA
Other	9.8 (8)	13.6 (6)	5.3 (2)	NA

*Mantel-Haenszel Chi-square for categorical and *t*-test for continuous variables to assess for differences between groups

TABLE 3
Overall Change in Behaviors of Participating Youth (mean±S.D.) (n=82)

Survey questions	Pre	Post	p-value*
a) I always have milk with dinner: 5=strongly agree; 4=agree; 3=Neither agree nor disagree; 2=disagree; 1=strongly disagree	2.97 ± 1.46	3.22 ± 1.38	.15
b) I always eat vegetables at dinner: 5=strongly agree; 4=agree; 3=Neither agree nor disagree; 2=disagree; 1=strongly disagree	3.70 ± 1.20	3.88 ± 0.92	.18
c) I always eat at least one fruit every day: 5=strongly agree; 4=agree; 3=Neither agree nor disagree; 2=disagree; 1=strongly disagree	4.24 ± 1.01	4.39 ± 0.87	.35
d) I drink soda pop (any type) or Gatorade every day: 1=strongly agree; 2=agree; 3=Neither agree nor disagree; 4=disagree; 5=strongly disagree	3.34 ± 1.11	3.59 ± 1.16	.03

*Significance level examining pre-post differences using ANOVA controlling for household bias

and pre-post changes are shown in Table 3 and 4. Among all youth, there were significant changes in their ability to identify whole grains correctly and in their consumption of soda or Gatorade (Tables 3 and 4).

Food Photo Journals

The data from the food photo journal regarding vegetable presence was inconclusive. No change was found in the presence and variety between the first and last sessions, nor was any correlation found between the presence and variety of vegetables and the self-reported intake of vegetables at dinner. Only 15 (18.3%) of the youth actually took pictures during both time periods, while another 19 (23.2%) took pictures during only one of the weeks, leaving 48 (58.5%) who did not take any pictures.

Quick Write (QW) Qualitative Feedback

Analysis of the QWs showed good agreement of coding between the different observers (Table 5). The comments of what was most memorable to the youth, briefly presented in Table 6, showed that the youth especially enjoyed cooking and eating the foods, participating in the nutrition and physical activities, and, more generally, just being with other kids in a fun setting.

DISCUSSION

The pre-post survey and food photo journal approaches were able to document few outcomes in this pilot study. Although the questions were the same as those used in other nutrition education

TABLE 4
Change in Knowledge of Participating Youth (mean ± S.D.) (n=43)^(a)

Survey Question	Pre	Post	p-value*
6) Which of the following is not a whole grain? popcorn, whole wheat bread, white rice, or oatmeal? 0 = incorrectly answered; 1=correctly answered (white rice)	0.03 ± 0.17	0.56 ± 0.63	.001
8) When making your own snacks at home, what are some good rules? wash hands with soap before starting; use a cutting board while cutting or slicing fruit; choose fruits and vegetables more often; all of the above; 0=incorrectly answered; 1=correctly answered (all of the above)	0.61 ± 0.49	0.70 ± 0.46	.27
9) Which of the following is an example of being physically active? Check all that apply. 1=correctly chose all activities; 0=incorrectly chose activities; correct: (walking to school, riding a bike, skateboarding, soccer practice, Wii playing); incorrect: (taking a nap, watching TV, riding in a car)	0.50 ± 0.51	0.53 ± 0.50	.75
10) Which is a healthy goal? try a new vegetable; play soccer for at least 60 minutes several days a week; drink water instead of soda; all of the above 0=incorrectly answered; 1=correctly answered (all of the above)	0.76 ± 0.44	0.85 ± 0.36	.26

^aThese questions were added after the study began and therefore only asked of a subset of youth. *Significance level examining pre-post differences using ANOVA controlling for household bias. (all of the above)

TABLE 5
Inter-Observer Coding Agreement of
Quick Write Comments

Class Section		# of Comments	# Agreed	Percent Agreement
Contra Costa	1	115	109	94.8
	2	230	221	96.1
	3	257	224	87.4
	4	89	78	87.6
Amador	1	58	51	87.9
	2	321	286	89.1
	4b	NA	NA	NA
	5	124	96	77.4
Totals		1194	1065	89.2

programs in the state, they may be less effective in capturing change in the 4-H club population than in low-income children reached through school delivery methods. Since the level of nutrition knowledge and behavior appeared nearly optimal at baseline, there was little room for improvement. The food photo journal did not provide very usable data very likely due to the inadequacy of instructions given to participants and inferior cameras. The results from the QWs suggested that both approaches may have overlooked other important outcomes.

The questions in Table 4, most of which have been used to evaluate nutrition education in California before, had mixed results. Question 5, related to the identification of whole grains, was very specific and well-tied to the curriculum. Since the youth had very limited knowledge of whole grains at baseline, it is not surprising that they showed increased ability to identify whole grains correctly. However, the other questions failed to be good measures of change with this group. At baseline, question 7 was answered correctly by 61% of the participants, demonstrating that it was too easy for this sample. With a 76% correct response rate at baseline, question 9 had similar indications of a high level of knowledge prior to participating in the classes. Question 8 asked about physical activities that were not included in the curriculum and may have been otherwise confusing. This question might have been more useful if it had included physical activities that were actually done

in class, such as jump-roping, badminton, and hula hooping.

Though knowledge changes may lead to and/or cause changes in behavior, this is not always the case, and direct measurements of changed behaviors are needed (Contento, Randell, & Basch, 2002.). The reduction in sweetened beverage intake that was seen might be expected due to the emphasis on choosing healthier beverages and snacks that are part of food groups on the MyPyramid. Additionally, milk was served during meals at each of the lessons, further reinforcing intake of non-sweetened beverages.

Most children self-reported near optimal fruit, vegetable, and dairy intake at baseline, leaving very little room for improvement. It is possible that intake of fruits, vegetables, and dairy increased, but the instrument that was used was not sensitive enough to capture such changes above high intake levels. However, even if a more sensitive instrument had been used, a six-week intervention and evaluation period may not be long enough for true behavior change to occur. There is some evidence from Oklahoma Cooperative Extension that eight cooking classes over a two-month period may be sufficient to detect an increase in self-reported fruit and vegetable intake among both youth and adult participants (Brown & Hermann, 2005). Even with better instruments, more emphasis on applying the new skills learned through a cooking class in the home setting may be needed to achieve a change in fruit and vegetable consumption (Cullen, Watson, Zakeri, Baranowski, & Baranowski, 2007).

Another way that we tried to capture behavior change was by looking at the pictures of the participants' dinner meals. Since the lessons emphasized eating more vegetables, we specifically looked for changes in the presence of vegetables at dinner. Other researchers who used survey tools among 4th-6th graders have reported a significant relationship between eating a vegetable at dinner and overall vegetable consumption (Sandeno, Wolf, Drake, & Reicks, 2000). The reason for lack of such a correlation in this study may not only be due to lack of sensitivity of the survey instrument used here, but also the quantity and quality of photographs. Not enough instruction was given to the children on how

TABLE 6
Themes from “Quick Writes”, with Most Frequently Mentioned Themes

	<i>Liked/Enjoyed</i>	<i>Learned or New</i>
Eating Foods	Pizza, Parfait and Spaghetti	Jicama, Whole wheat breads/pizza crust and Brown rice
Cooking Foods	Cutting/chopping fruits/vegetables, Making scrambled eggs and Flipping quesadillas	Making recipes, Cutting/chopping & knife/kitchen safety and Using cooking equipment/utensils
Health Activity	“Eating the rainbow”, Grocery bag sorting and Glow-in-the-dark hand washing	Hand washing, Whole grains and Importance of “Eating the Rainbow”
Physical Activity	Jump rope, Hula hooping and Badminton	Jump rope, Badminton and Hula hooping

to take pictures of their dinner meals, as evidenced by numerous inconsistencies among the pictures. Many of them were blurry and inadequately lit. There was also little incentive for the children to participate in this part of the research because it was often just seen as extra work, although some participants enjoyed taking pictures of their food, as indicated by comments in the QWs. For this method to yield better data in the future, more instruction must be given to the children about how to take pictures of their food and how to use a food journal. Providing better digital cameras instead of disposable cameras would produce higher quality pictures for many reasons. Pictures taken with digital cameras can be immediately viewed and retaken if needed. Digital photos with automatic time and date stamping also help confirm the foods were consumed during the time period of interest. The indicators used to measure change should also be taken into consideration. We examined the variety of vegetables present at each meal, but with better quality pictures and a brief food journal, it would be possible to quantify the servings of the MyPyramid food group (Martin, et al., 2009). A measure of overall food group adequacy would be a better indicator of dietary patterns than strictly focusing on the vegetable group alone.

The qualitative data can be used to develop better evaluation tools to capture changes that may result from the curriculum, including behavior changes. Similar to how qualitative feedback from focus groups done during pilot testing can be used to help develop content and/or delivery of a program, insights as to what is most salient in the participants’ mind after each class session can help indicate and influence perhaps more long-term or pronounced

outcomes. For instance, there were a large number of QW comments on increased knowledge from the hand washing activity, as seen in Table 6 and 7, but there were no questions to measure change in hand washing behavior or knowledge.

TABLE 7
Selected Quick Write Comments Related to (a) Eating Food, (b) Cooking Food, (c) Health Activity, and (d) Physical Activity

(a)	<i>Eating Food</i> “I liked dinner because we made dinner.” “Whole wheat crust is actually really good.”
(b)	<i>Cooking Food</i> “I learned that you have to be very careful in a kitchen.” “I saw people putting zucchini on their pizza I thought that was weird, but they told me to try it and I did and it was really good.” “I learned that germs are very hard to get off and that cooking takes a lot of responsibility. Now I can cook with my Mom and Grandma. I was very proud of my cheesy pizza.”
(c)	<i>Health Activity</i> “I learned how to wash my hands better.” “I had fun organizing the grains and finding out about the different types.”
(d)	<i>Physical Activity</i> “The badminton was hard at first but I got a whole lot better.” “I liked playing jump rope because I could teach a lot of different songs.” “I learned how to run in and out of a jump rope.”

This could be assessed by a pre-post question asking whether the children wash their hands before handling or eating foods. Extension programs have documented improvement in food safety behaviors among youth and adults participating in cooking classes (Brown & Hermann, 2005). A knowledge question might be included to ask about whether rinsing hands in cold water is enough to remove germs, a topic that was explicitly covered. Other comments suggest that additional outcomes could be captured, including: how much the kids like cooking; self-efficacy in cooking/using cooking utensils; interest in trying new foods; and whether activities done in class (cooking/shopping, cleaning, physical activity, etc.) lead to changes in home behaviors.

Some other behavior changes related to social themes were also observed in the QWs. There were numerous comments about enjoying interacting with other youth in the class, including cooking with, playing with, learning from and just being with others. It was also clear from certain comments that participants felt more self-confident around cooking and doing physical activities as a result of the class. For instance, some youth wrote: "The badminton was hard at first but I got a whole lot better," "I am getting better at the jump rope," and "I am a surprisingly good cook." Other cooking programs among youth have also documented positive changes in perceived cooking ability and skills (Beets, Swanger, Wilcox, & Cardinal, 2007; Hyland, Stacy, Adamson, & Moynihan, 2006). However, in this study, there were a few specific comments showing disappointment related to recipes not being chosen during the meal planning activity. For example, "My recipe did not get chosen," and "My recipe lost."

CONCLUSION

Healthy Living projects focusing on nutrition and physical activity have the potential to prevent childhood obesity, but more comprehensive evaluation is necessary to document and ensure behavioral changes are happening. Results from the pre-post surveys reinforce the need to tailor instruments to the target population and curriculum to yield useful outcome measures of the desired knowledge and behaviors. The food photo journal method shows

potential to overcome limitations of traditional dietary behavior methods, but needs to be further developed and tested. The Quick Write reflection provides qualitative data that can capture important themes relating to knowledge, behavior, and social factors such as self-efficacy. These approaches complement each other by evaluating different aspects and can be used in improving evidence-based nutrition education and intervention programs.

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Appendix A: Four-Item Survey

Name _____

1. How old are you? _____
2. What is your grade? _____
3. Are you : boy _____ girl _____
4. Which groups do you consider yourself to be? (Check all that apply.)

_____ White/non-Hispanic
_____ Latino/Hispanic
_____ African-American
_____ Asian-American
_____ American Indian
_____ Other _____

5. The following statements are about the foods and beverages you eat and drink.
Think about last week and pick the best answer. (Choose one.)

- (a) I always have milk with dinner:
- _____ Strongly agree
_____ Agree
_____ Neither agree nor disagree
_____ Disagree
_____ Strongly disagree
- (b) I always eat vegetables at dinner:
- _____ Strongly agree
_____ Agree
_____ Neither agree nor disagree
_____ Disagree
_____ Strongly disagree
- (c) I always eat at least one fruit every day:
- _____ Strongly agree
_____ Agree
_____ Neither agree nor disagree
_____ Disagree
_____ Strongly disagree
- (d) I drink soda pop (any type) or Gatorade every day:
- _____ Strongly agree
_____ Agree
_____ Neither agree nor disagree
_____ Disagree
_____ Strongly disagree

Appendix B: Nine-Item Survey

Name _____

1. How old are you? _____
2. What is your grade? _____
3. Are you : boy _____ girl _____
4. Which groups do you consider yourself to be? (Check all that apply.)

_____ White/non-Hispanic
_____ Latino/Hispanic
_____ African-American
_____ Asian-American
_____ American Indian
_____ Other _____

5. The following statements are about the foods and beverages you eat and drink.
Think about last week and pick the best answer. (Choose one.)

- (a) I always have milk with dinner:
_____ Strongly agree
_____ Agree
_____ Neither agree nor disagree
_____ Disagree
_____ Strongly disagree
 - (b) I always eat vegetables at dinner:
_____ Strongly agree
_____ Agree
_____ Neither agree nor disagree
_____ Disagree
_____ Strongly disagree
 - (c) I always eat at least one fruit every day:
_____ Strongly agree
_____ Agree
_____ Neither agree nor disagree
_____ Disagree
_____ Strongly disagree
 - (d) I drink soda pop (any type) or Gatorade every day:
_____ Strongly agree
_____ Agree
_____ Neither agree nor disagree
_____ Disagree
_____ Strongly disagree
6. Which of the following is not a whole grain?
_____ Popcorn
_____ Whole wheat bread
_____ White rice
_____ Oatmeal

7. Did you help plan or prepare a meal last week?

☐ Yes

☐ No

8. When making your own snacks at home, what are some good rules?

☐ Wash hands with soap and water before starting

☐ Use a cutting board while cutting or slicing food

☐ Choose fruits and vegetables more often

☐ All of the above

9. Which of the following is an example of being physically active? Check all that apply.

☐ Walking to school

☐ Soccer practice

☐ Riding a bike

☐ Wii playing

☐ Taking a nap

☐ Watching TV

☐ Skateboarding

☐ Riding in a car

10. Which is a healthy goal?

☐ Try a new vegetable

☐ Play soccer for at least 60 minutes several days a week

☐ Drink water instead of soda

☐ All of the above

Professional Development Increases Afterschool Staff's Confidence and Competence in Delivering Science, Engineering and Technology

Sharon K. Junge and Sue S. Manglallan

Afterschool programs are increasingly seen as a potential venue for addressing the critical need for improving science literacy among American youth. Building the capacity of afterschool staff to incorporate science, engineering, and technology youth development experiences in afterschool settings is central to this task. Few staff development training modules exist which incorporate identified best practices in nonformal science education. This study measured the effectiveness of the *4-H Tools of the Trade II...Inspiring Young Minds to Be SET Ready for Life!* staff development training manual in increasing afterschool staff's awareness, appreciation and understanding of high quality science experiences, as well as enhancing confidence and competence in delivering in afterschool environments.

There is no time in history when it has been more important for us to prepare young people to be proficient in science, technology, engineering, and math (STEM). "For the first time in generations, the nation's children could face poorer prospects than their parents and grandparents did" is the startling prediction of the National Academy of Sciences, National Academy of Engineering, and Institute of Medicine (2007, p. 13). In their report, *Rising Above the Gathering Storm*, a major premise is the poor performance of American children in science, technology, engineering and math (STEM), a lower number of students pursuing advanced degrees in these same disciplines, and declining teacher preparation to teach these subjects.

Increasingly afterschool programs are considered a potential venue for sparking youths' interest and enhancing their skills in STEM topics, as well as reinforcing formal classroom learning in these subjects. The National Research Council's report, *Surrounded by Science: Learning Science in Informal Environments* (Bell, Lowenstein, Shouse & Feder,

2009), emphasizes that "despite the widespread belief that schools are responsible for addressing the scientific knowledge needs of society, the reality is that schools cannot act alone (p. 1)." The Council's lengthy report highlights the role and value of informal experiences as provided by afterschool programs, to improve science education and learning.

According to the Coalition for Science Afterschool (CSAS) in *Science in Afterschool: A Blueprint for Action* (Friedman & Quinn, 2007), afterschool programs have characteristics that make them uniquely suited to provide science-rich experiences. Afterschool programs allow young people to explore their own interests, at their own pace (Miller, 2003), form their own questions for further exploration (Friedman & Quinn, 2007), practice knowledge gained in school (McLaughlin, 2002; Miller, 2003), and provide authentic hands on opportunities for skill building (Noam, Biancarosa & Dechausay, 2003). Furthermore, seventy-five percent of Nobel science winners attribute that their interest in science was first cultivated outside the classroom (Friedman, 2005).

Critical to the effective delivery of STEM in afterschool settings is well trained staff. The Coalition for Science Afterschool (2007) accentuate that the goals of increasing the quality of science programming in afterschool cannot be achieved without investment in building afterschool staff capacity in these areas. This is echoed by Freeman,

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Dorph, and Chi (2009) whose work indicates “transforming the existing cadre of afterschool instructors into effective facilitators of STEM learning will require significant attention to and investments in staff development.” In their CSAS sponsored report, *Strengthening Afterschool STEM Staff Development* (2009, p. 24), they draw on the work of Gil Noam (2008) in *A New Day for Youth*, who describes quality afterschool programming as having three essential elements; staff capacity, including training, and relational care being one of three sides of his triangular model (programmatic support and content are the other two sides).

This need is demonstrated in the *Science in Afterschool Market Research Study* (Chi, Freeman & Lee, 2008). The study indicates that approximately 76% of afterschool programs do not have a dedicated science person on staff and most who teach science have little science background. Even more notable in the study, is that approximately half of the staff who lead science activities in afterschool programs have not participated in STEM staff development opportunities.

The field has begun to identify three broad staff populations with unique views and needs requiring targeted approaches to meet their STEM staff development needs (Freeman, Dorph & Chi, 2009). These can be described as afterschool staff who are:

- Receptive to STEM but lack understanding of the need and how to address it. This group benefits from training emphasizing the positive impact of STEM and use of high quality curriculum resources and best practices.
- Resistant to STEM because of a perceived lack of experience. Staff development for this group should focus on STEM processes and student-centered activities that require less content expertise.
- Demanding fun activities at the expense of consistent programming and defined learning objectives. These staff benefit from resources that are effective and easy to install and training that values consistency, sequential learning and relevance to the school day.

Attitudes of afterschool staff towards STEM have

been identified in other studies as a barrier to delivery of effective programs. Seidel, Aryeh, & Steinberg (2002, p. 34) found that excellence in science delivery was associated more with beliefs and attitudes than with particular training or skills. The CSAS Staff Development Community of Practice (Freeman, Dorph & Chi, 2009) identified staff’s fear of science, viewing science as an academic subject only, and a preference for playing with kids rather than teaching them as issues influencing staff development. The National Research Council (1998) in *Every Child a Scientist*, highlights the importance of teacher interest and motivation in science learning as does Dierking (2007) in her work.

Afterschool staff also often have uneven backgrounds in respect to science content and pedagogy and may lack strong facilitation skills needed to deliver effective STEM activities (Walker, Wahl & Rivas, 2005). However, studies show afterschool staff, as facilitators, can help develop and deepen youth’s interest for science (Hidi & Renninger, 2006), an important first step in science learning (Renninger, 2007). Mentors and staff who receive facilitation training have been shown to be more successful in providing educational experiences in afterschool programs (Ferreria, 2001; Foster, 2001; Jekielek, Moore & Hair, 2002).

Afterschool staff report they would like to increase the quantity and quality of science activities provided in their afterschool settings (Chi, Freeman & Lee, 2008). *The Science in Afterschool Market Research Study* (Chi, et al., 2008) asked staff what types of support would be needed to increase quality and/or quantity of science activities for afterschool youth. Staff identified significant challenges including limited funding, time, staff training and staff interest for science programming.

The near absence of significant empirical research in effective afterschool staff development in STEM presents challenges for designers of effective training curriculum. Schwartz and Noam (2007) suggest looking at best practices in quality afterschool programming for direction in designing staff development programs. Using the knowledge and understanding of the previously discussed issues

surrounding professional development of afterschool program staff, we, along with colleagues, Jackie Reilly and Eric Killian at the University of Nevada, Reno, developed a comprehensive staff development training guide, *Tools of the Trade II...Inspiring Young Minds to Be SET Ready for Life!* (Junge, Manglallan, Reilly, & Killian, 2009).

This report presents an evaluation of the effectiveness of an eight hour training, utilizing the *Tools of the Trade II ... Inspiring Young Minds to Be SET Ready for Life!*, a guide for increasing afterschool and out-of-school time (OST) staff's understanding, knowledge and confidence in delivering science, engineering, and technology (SET) content trainings and providing quality SET experiences with youth.

Description of *Tools of the Trade II ...SET Ready for Life!*

Drawing from research and best practices, *Tools of the Trade II ...Inspiring Young Minds to Be SET Ready for Life!* uses a hands-on, experiential, interactive skill-building approach to enhance the capacity of afterschool staff to incorporate effective science, engineering, and technology youth development experiences in afterschool settings. Specifically, the training curriculum is designed to:

- Increase awareness, appreciation, and understanding of youth science, engineering, and technology programming in afterschool settings.
- Increase knowledge, skills, competence, and confidence in identifying, designing, and delivering high quality science, engineering, and technology experiences that are age-appropriate and based on best practices.
- Increase afterschool staff ability to develop effective partnerships and collaborations to support science, engineering, and technology.

Content for the curriculum intentionally focuses on utilizing inquiry-based and experiential learning strategies, incorporating science, engineering and technology processes, creating SET-rich environments, embracing the role as a facilitator of quality science learning, increasing confidence in delivering SET, and incorporating SET abilities in afterschool programs. Following is a discussion of each.

Utilizing Inquiry-based and Experiential Learning Strategies

An abundance of research points to the critical importance of facilitators of STEM learning to utilize inquiry-based and experiential learning strategies in their teaching (Feichel, & Schweingruber, 2010; Bell, Lewenstein, Shouse, & Feder, 2009; National Research Council, 2000). Inquiry strategies capitalize on youths' curiosity and the scientific method to support youths' learning of critical thinking skills, as well as important science content and concepts (National Research Council, 1996). It is important to complement inquiry-based learning with the use of experiential learning (STEL Workgroup, 2005). Experiential learning focuses on the *process of learning*, rather than the *product of learning*, and is especially effective when the goal of the learning is *understanding in depth* versus just information transfer (STEL Workgroup, 2005). As accentuated in the training, afterschool staff need to be mindful that all hands-on learning does not necessarily include experiential or inquiry learning and they should be thoughtful and intentional in incorporating these and questioning strategies in their science facilitation.

Incorporating Science, Engineering and Technology Processes

The *process skills* of science, engineering, and technology are integrated into the abilities of scientific inquiry (National Research Council, 2000) and emphasize asking questions, planning and conducting investigations, using appropriate tools and techniques to collect data, thinking about the relationship between evidence and explanations, constructing and analyzing explanations and communicating the results. Early in the formative development of the *Tools of the Trade II...Inspiring Young Minds to be SET Ready for Life!* manual, when working with afterschool directors and line staff, we surprisingly observed that many did not have a working definition of science, engineering and technology and were not able to readily differentiate between the three disciplines, nor see the inter-connection of the three. This led us to design *Explore It! Design It! Use It!*,

the first content session of the manual, to establish a baseline of understanding and anchor future teaching.

Creating SET Rich Environments

The National Research Council's report, *Learning Science in Informal Environments...People, Places and Pursuits* (Bell et al., 2009), outlined six strands that informal educational programs should strive for when designing science learning experiences in informal settings like afterschool programs. These six strands include an opportunity for youth to: develop an excitement and joy for science; use and understand concepts and facts; test, explore, question, observe and make sense of the natural and physical world; understand science processes; use science language and tools; and see themselves as science learners and someone who knows about, uses and sometimes contributes to science.

For this reason, a session was developed specifically to teach these six aspects of quality informal science education. The effectiveness of this session in increasing participants' knowledge and understanding of how to apply these elements is important evidence to improving SET learning environments in afterschool programs.

Embracing Role as Facilitator of Quality Science Learning

Introducing youth to the culture of science, including its reasoning, tools of observation and measurement, standards of evidence, and the values and beliefs underlying scientific knowledge, is a "major instructional challenge" (National Research Council, 2005, p. 421). The role of the facilitator or teacher is critical. Even facilitators who are not experts in science can be effective intermediaries to informal learning (Feichel & Schweingruber, 2010, p. 77). The facilitator can create an environment where STEM learning is valued and supported, help spark the youth's interest, guide the investigation and discovery, and scaffold the learning. Staff's understanding of participant interest have shown to influence the organization, facilitation and youth participation in science activities (Renninger, 2007).

Increasing Confidence in Delivering SET

As discussed earlier, afterschool staff's fear of science, viewing science as an academic subject only, and a preference for playing with kids rather than teaching them (Freeman, et al., 2009) all contribute to a lack of confidence in delivering science. Addressing these issues with staff, as is done in the first session of the *Tools of the Trade II...Inspiring Young Minds to Be SET Ready for Life!* training, is a first step in building confidence. Providing ongoing support and encouragement, intertwined within the session content is essential. Helping staff to view themselves as learners, being eager to try new ways of teaching and extend and sharpen their subject matter knowledge is recommended by the National Research Council (2000).

Incorporating SET Abilities in Afterschool Programs

The science education field continues to grow in its understanding of how youth learn science and how it should be taught. The National Research Council (1996) recommends a shift in practice, from being solely focused on the content to be learned, to one of how to learn the content and how the content is taught. The integration of SET abilities instruction into everyday afterschool programming supports this recommendation.

See Figure 1 for descriptions of the 14 workshops, encompassing 21 hours of training, which incorporate the above-referenced elements identified as being important to the professional development of afterschool staff delivering science programming.

METHOD

Sample

This study was conducted using a multi-site evaluation methodology, with each of five training locations (Davis, Los Angeles, Merced, Watsonville, and San Diego) using the same questionnaire and following the same protocol. Participants represented a diverse cross-section of afterschool programs from urban, suburban and rural areas, funded through a

FIGURE 1
Tools of the Trade II Session Description

Tools of the Trade II
Inspiring Young Minds to be SET* Ready for Life!
*Science, Engineering, & Technology



SESSION DESCRIPTIONS

Session 1: Inspiring Young Minds...The Scientist in All of Us

Science is everywhere! Kids are curious and love to learn about the world around them. Afterschool staff can play an important role in facilitating youth's learning about science, engineering, and technology (SET). This session provides an introduction to the Afterschool SET Ready for Life Checklist and elements for high quality SET programming in afterschools.

Session 2: Explore It! (Science) Design It! (Engineering) Use it! (Technology)

What does it mean to be scientifically literate? The American Association for the Advancement of Science describes a scientifically literate person as one who is aware that science, engineering, and technology are human enterprises and applies scientific content and abilities in meaningful ways. Understanding the relevance of science, engineering, and technology and the language of math in afterschool settings and how these complement each other is the focus of this session.

Session 3: SET Abilities for the 21st Century!

Hearing a lot about science, engineering, and technology (SET) these days? In a fun and hands-on way, learn which SET abilities 21st century kids need for success and how your program can support the development of these skills and abilities in fun and interactive ways. Special emphasis is given to fostering observation skills, one of the most critical SET abilities.

Session 4: Hands On! Minds On!...Inquiry and Experiential Learning

Inquiry and experiential learning are natural ways to learn. This session introduces youth workers to the concepts of experiential learning and science inquiry. Understanding these concepts helps youth workers capitalize on kid's interests, assure better learning outcomes and provide exciting learning opportunities for acquisition of science, engineering, and technology knowledge and skills.

Session 5: How Kids Learn Science and What Does It Mean to Afterschool

Thanks to science research and more sophisticated engineered technologies, such as PET scans, we know much more about how kids learn and how educators can facilitate enhanced learning. This session will focus on three fundamental principles for learning as identified by the National Academics of Science: 1) attention to prior knowledge; 2) foundation of factual knowledge and understanding; and 3) learner self-regulation. This session builds on Session 4 which introduces inquiry and experiential learning as important strategies for effective learning.

Session 6: Kid Fit Science...Ages and Stages and SET

Afterschool programs often serve youth ages 5 to 14. Recognizing the different ages and stages of youth and applying this to science, engineering, and technology (SET) programming is critical to achieving desired youth outcomes. In this session, afterschool staff will review developmental stages of afterschool youth and learn how to facilitate SET with mixed-age groups. Applying the National Science Education Content Standards to age-appropriate practice is also covered.

Session 7: Creating SET-Rich Environments

Science is everywhere! Afterschool staff play an important role in developing SET learning opportunities, increasing youth's natural interest, promoting learner-centered science and integrating science throughout the afterschool hours. Science is not just topic to study, it is a way of thinking that can be applied to many components in the afterschool setting. This session uses a carousel of group-directed, mini-centers that feature ways to create SET-rich environments.

Session 8: Under the Microscope...How to Identify and Adapt SET Curriculum for Afterschool

Afterschool staff may be uncertain of how to select a science, engineering, or technology (SET) curriculum that meets the needs, interests, and ages of kids in their program. This session focuses on how to use a rubric for assessing quality SET curriculum and activities that will inspire kids to want to learn more!

Session 9: SET Everyday...Using Centers in Afterschool

This session focuses on knowledge-centered, learner-driven activities that can be easily delivered through centers in your afterschool program. Eleven elements of effective SET (science, engineering, and technology) learning centers are discussed. Tips for facilitating and managing centers are also covered.

Session 10: Science and Literacy...Using Fiction and Non-Fiction Science Text in Afterschool

Books are an important element of science learning. This session focuses on how to select and incorporate a variety of science, engineering, and technology (SET) genre in afterschool programs to support children's exploration and learning.

Session 11: Teens in Afterschool...What's the SET Connection?

Teens can be engaged in afterschool in many ways. They can be mentors and effectively involve younger youth in science, engineering, and technology programming. This session will look at youth-adult partnerships and how these partnerships can enhance the experience for younger youth and teens.

Session 12: Building the Bridge...Using Collaboration and Partnerships to Strengthen Your SET Programming

Creative partnerships have transformed afterschool programs and inspired kids' interest in science, engineering, and technology (SET) while supporting positive youth development. Providing SET experiences in your afterschool programs is hard to do alone. Qualified and willing community partners and collaborators can strengthen your program and add more interest.

Session 13: Family Science ...It's Not How I Learned Science!

Involving parents and families in afterschool science, engineering, and technology (SET) programming produces real payoffs for youth, families, and afterschool programs. Afterschool staff have a powerful influence on sparking families' interest in SET. Learn how to extend youth's learning and increase their interest in SET through family science nights, family take-home backpacks, and other strategies that involve parents in your afterschool program.

Session 14: Ready SET Go! SET in Afterschool

How do we use all that we know about science, engineering, and technology and learning in an afterschool program? This session includes a review of the Afterschool SET Ready for Life Checklist and how to use it in your afterschool program. Additionally, the session helps participants create an action plan for implementing the concepts presented in Tools of the Trade II: Inspiring Young Minds to be SET* Ready for Life (*Science, Engineering, and Technology.)

variety of funding streams including state and federal afterschool programs, military child care, private, and nonprofit programs. Seventy-seven participants completed the questionnaires at the end of an eight hour full day training.

Data

Seven retrospective pre/post questions related to the afterschool staff's perceived understanding of SET concepts and their confidence and readiness in delivering high quality science experiences, while narrative questions allowed participants to express those aspects of the training which were most valuable to their learning. The items were drawn from the session evaluations developed to measure outcomes for each workshop contained in the *Tools of the Trade II...Inspiring Young Minds to be SET-Ready for Life!* staff development guide. These included elements of high quality SET programming, inquiry and experiential learning, SET processes, and SET-rich environments, as well as their facilitation skills, confidence, and ability to incorporate these into an afterschool setting. See Table 1 for specific questions. Participants rated each item as to how they felt before and after the training, using the retrospective pre-test and a Likert-type scale where 1= *not at all*, 2=*slightly*, 3=*somewhat*, 4=*very* and 5=*absolutely*.

The retrospective pretest-posttest approach was deemed appropriate, as some of the participants could possibly overestimate their knowledge and understanding of the SET concepts before the training (Pratt, McGuigan, & Katzev, 2000). Rockwell and Kohn (1989) report the retrospective design has shown to provide greater accuracy of response in situations where participants are asked to respond to a question about how much they know about a particular subject after they have some knowledge of the subject. In these cases, using the retrospective format, the participant is able to more accurately reflect on the degree of change in knowledge or attitude. Additionally, the retrospective design, having only to be administered once during the training, was more time efficient and less obtrusive to the participants (Hill & Betz, 2005).

The eight hour training included five of the fourteen workshops included in the *Tools of the Trade II ... Inspiring Young Minds to Be SET Ready for Life!* professional development guide. Content included: science, engineering, and technology processes, inquiry and experiential learning, SET-abilities, SET-rich environments, using fiction and non-fiction SET text, and introduction to SET in afterschool. Participants were also asked to list the three most important things learned that they would use in their program.

Analysis

Participants' before and after ratings were analyzed using a paired *t* test. Qualitative ratings were analyzed through frequency counts of responses subsequently which were ranked to reveal the top three most important things learned that participants would use in their program.

RESULTS

Analysis revealed a significant, positive change for each of the seven items ($p < .0001$). Differences in means between the pre- and post- survey responses ranged from 1.30 for *understand and know how to use science, engineering and technology processes* to 1.99 for *understand how to create SET-rich environments that incorporate the six strands outlined by the National Research Council*. Table 1 presents the retrospective pre-test – post-test training mean scores and results of the paired *t* tests.

Participants were asked to list *the three most important things learned that you will use in your program*. The most frequently cited responses included the following.

Inquiry, experiential, and hands-on strategies

These concepts were emphasized throughout the eight hour training and specifically targeted in the session, *Hands-On! Minds-On! Inquiry and Experiential Learning*. Participants provided comments such as "Children learn and remember when they have hands-

TABLE 1
Knowledge and Understanding Before and After Training

	N	Before Training	After Training	Mean Difference*	p-value
1. Understand the elements of high quality SET programming in afterschool programs.	73	2.27*	4.19	1.92	< .0001
2. Understand inquiry and experiential learning and how to apply to SET programming in afterschool settings.	73	2.49	4.24	1.75	< .0001
3. Understand and know how to use science, engineering and technology processes.	73	2.9	4.2	1.30	< .0001
4. Understand how to create SET-rich environments that incorporate the Six Strands (NRC).	61	2.01	4.0	1.99	< .0001
5. Recognize and appreciate afterschool staff's role as a facilitator of youth's acquisition of SET.	72	2.9	4.37	1.47	< .0001
6. Feel confident to train afterschool staff to deliver high quality SET programs.	60	2.5	4.15	1.65	< .0001
7. Understand the concept and content of SET abilities and how to incorporate in an afterschool setting.	72	2.55	4.16	1.61	< .0001

*Means are based on a Likert scale of 1-5 with 1 meaning *not at all* and 5 meaning *absolutely*.

on inquiry,” “Difference between hands-on learning and inquiry-based,” “The difference of real hands-on and textbook hands-on,” “Using open-ended projects allow more creativity,” and “Experiential learning is much more fun and effective than traditional learning.”

Question Strategies and Incorporating Science Language

Questioning strategies is an essential part of inquiry and was heavily modeled throughout the entire training. It also was the strategy most often listed as one participants plan to apply. Specifically mentioned were: “How to ask questions,” “How important open-ended questions are,” “Allowing youth time to think about questions,” “Question style,” and “Incorporate science language and questioning into training.”

Science, Engineering, and Technology Processes

Participants repeatedly mentioned their intention to emphasize more of the science processes in their programming. Specifically mentioned were: “What the science processes are,” “How science is in engineering and technology,” “What is a scientist, engineer, and technologist,” and “How to use the processes in presenting SET.”

SET Abilities

The National 4-H SET initiative introduced the concept of *SET Abilities* (Horton, Gogolski, & Warkentien, 2007), which are the thirty abilities most frequently cited in STEM education literature as being essential for youth science literacy. An entire session of the workshop was devoted to SET Abilities, with a specific focus on honing youths’ observation skills. Comments made by participants included: “Do skill activity w/teens and afterschool staff to help them understand observation,” “Observations,” “SET abilities to be ready for life,” and “How to use SET abilities to teach children to be successful.”

DISCUSSION AND CONCLUSION

The results of the evaluation revealed the training led to positive change in participants’ knowledge of core aspects of quality SET programming in afterschool settings, understanding their important role as a facilitator of effective science, engineering, and technology and their confidence and ability to apply the principles of the training. The study also provides more evidence on the effectiveness of using a comprehensive training manual, designed specifically for afterschool programs and based on research and

best practice, to enhance afterschool staff and trainers' skills, competence, and confidence in improving the quality of afterschool STEM programming. The training, anchored in positive youth development practices, focused on building internal program expertise while meeting professional development needs; both are recommendations of CSAS's *Strengthening Afterschool STEM Staff Development* report (Freeman et al., 2009).

We recognize the limitations in the study. Although the participants in the study represented diverse (geographic, socio-economic, philosophies, and funding streams) afterschool programs, it was not a random sample, but rather those who attended one of the scheduled trainings. Additionally, a study focusing on the effectiveness of those who received the training in delivering the content to other afterschool staff would be valuable. Finally, although the retrospective pretest - posttest was deemed appropriate for the situation and the changes being measured, the findings must be tempered by the bias that could be present in participants' responses (Hill & Betz, 2005).

Although this study is an important first step in measuring benefits of professional development in enhancing program quality, there is a need for more comprehensive evaluations that assess the long-term outcomes including enhanced youth performance (Bouffard & Little, 2004).

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Moving Beyond the Demonstration Model: The Importance of Experiential Learning in the 4-H Youth Development Program

Lynn Schmitt-McQuitty and Martin H. Smith

Experiential learning is a pedagogical strategy that focuses on providing learners with opportunities to construct meaning through hands-on experiences that are highly social in nature. Although 4-H emphasizes the use of hands-on, “learn-by-doing” projects and activities, and 4-H educators have developed and provided materials that have been designed in an experiential manner, demonstrations remain the principal educational method used in the 4-H Youth Development Program. Thus, the goal of this chapter is to provide: an overview of the history of learning in 4-H; a description of the experiential learning process; a summary of the research, development, and extension of experiential learning workshops that include materials for 4-H educators; and strategies that can expand volunteers’ knowledge and improve their abilities to deliver effective educational programming using experiential learning.

Professional development for staff and volunteers is an important component of the 4-H Youth Development Program. Ensuring that program staff are current on effective pedagogical methods, as well as important content can help ensure staff have the skills and capacity to successfully train volunteers, which can lead to the delivery of high quality programs for youth participants. Additionally, volunteers are often parents and not professional educators, and thus may not be cognizant of the research surrounding the best methods associated with nonformal learning. Therefore, volunteer development is critical to help ensure success in their role as nonformal educators facilitating youth programs. The project described here developed and evaluated trainings for staff and volunteers on the experiential learning cycle and on methods for working most effectively in delivering nonformal programming to young people.

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History of Cooperative Extension and the 4-H Youth Development Program

The origins of the Cooperative Extension System can be traced to the Morrill Act of 1862 which established land grant universities in every state with the purposes of providing agricultural and mechanical education and teaching military tactics (Comer, Campbell, Edwards, & Hillison, 2006). In 1887, the Hatch Act linked land grant universities and the United States Department of Agriculture (USDA) through the allocation of federal funds for agricultural research in an effort to improve farming productivity (Comer et al., 2006). The Smith-Lever Act of 1914 formally established Cooperative Extension with the goal of advancing agricultural techniques based on local needs and disseminating information on agriculture to the public (Comer et al., 2006). Today, research and education in agriculture remain foundational elements of the Cooperative Extension System; however, through efforts to respond to the expanding needs of society, Cooperative Extension has diversified and also includes a wide variety of programs in the areas of human and natural resources.

The 4-H Youth Development Program is a national nonformal education organization for youth aged

5-19 that is directed by Cooperative Extension in each state. The origins of 4-H can be found in Boys and Girls Agricultural Clubs that appeared in different parts of the country around the turn of the 20th century (Enfield, 2001). These clubs emphasized practical and relevant education for youth around issues related to agriculture and utilized a “learn by doing” strategy. Although the 4-H Program in the 21st century maintains a strong agricultural component it offers a much wider variety of projects and programs, ranging from animal science to aviation and rocketry and from plant science to citizenship and computers (United States Department of Agriculture, 2003). Guided by adult volunteers who serve as nonformal educators (Boyd, 2004; Stedman & Rudd, 2006), 4-H members were traditionally organized into neighborhood or community-based clubs; however, as enrollment has shifted over the decades from a rural to a more urban base, afterschool programs, summer camps, and other shorter-term opportunities for participation have become common within the 4-H membership structure (Enfield, 2001).

Learning in Cooperative Extension and 4-H

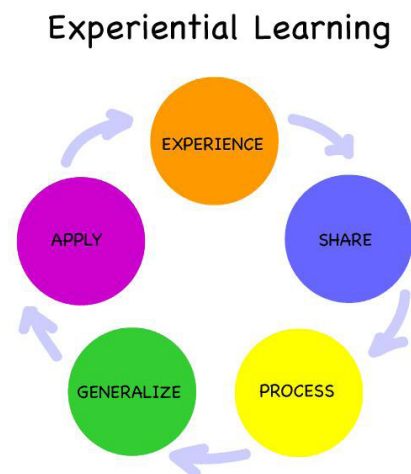
From its beginnings, Cooperative Extension has capitalized on a distinct learning approach – demonstrations (Enfield, 2001). To help accomplish its mission of extending new knowledge to the public, Cooperative Extension educators would hold demonstrations with farmers on innovative agricultural practices (Comer et al., 2006). This learning approach involved the introduction of new methods and ideas by Extension educators to their constituency on their own property, with the idea that through the authentic application of this new knowledge these individuals would be more likely to adopt novel practices and improve their agricultural productivity (Comer et al., 2006; Enfield, 2001). The demonstration model was, and still is, the principal educational method used throughout Cooperative Extension and is the key approach to learning in the 4-H Youth Development Program (Enfield, 2001).

The demonstration model of learning in Cooperative Extension and 4-H most closely resembles the Traditional Learning Approach that

is described by Lambert et al. (2002). The educator demonstrates the knowledge that is the source of information; the individuals who receive the information are the knowledge recipients. However, Cooperative Extension/4-H faculty and county-based academic staff have also been promoting experiential learning and developing the capacity for its use in 4-H for several decades (McArthur, Shields, & Zurcher, 1987; Horton & Hutchinson, 1997; Horton, Hutchinson, Barkman, Machtmes, & Myers, 1999).

Through experiential learning, youth are provided opportunities to construct meaning through hands-on “learn by doing” experiences that are highly social in nature, and encompass the qualities of constructivist learning. Although a variety of models have been utilized in designing curricula and in developing training for 4-H volunteers and staff (Enfield, 2001), an experiential learning model using a five-step learning cycle (Figure 1) based on the work of Kolb (1984) and Pfeiffer and Jones (1985) is the most common one currently used in the 4-H Youth Development Program.

FIGURE 1
5-Step Learning Cycle (UC-STEL, 2005)



EXPERIENTIAL LEARNING AND LEARNING IN 4-H

Experiential Learning

The basis of all experiential learning lies in the participants’ experience. It is the experience that

creates the foundation by which deep and purposeful learning can occur. In fact, many educators believe that without an experience there can neither be true learning nor real understanding of a concept or situation (Andresen, Boud, & Cohen, 2000; Kolb, 1984; Dewey, 1938). However, not all experiences are equally educative (Dewey, 1938); an isolated experience without the opportunity for the individual to reflect upon the learning and apply new knowledge may be miseducative (Dewey, 1938). Thus, educators need to craft environments whereby learners have opportunities to reflect upon their experiences and apply their knowledge such that their learning can become meaningful and positive (Dewey, 1938; Enfield, 2001).

To ensure that a learning experience leads to knowledge and comprehension, a progression of three distinct elements is needed: 1) A “*concrete experience*” (Enfield, 2001; Kolb, 1984) where the learner is engaged in an investigation by executing an activity of some kind; 2) a “*reflection*” stage (Enfield, 2001; Kolb, 1984; Pfeiffer & Jones, 1985) where the learner can *share* thoughts and feelings with others, *process* the experience through contemplation and dialogue, and make *generalizations* to real world examples; and 3) an “*application*” phase (Carlson & Maxa, 1998) that aids the learner in gaining a full and extended understanding of a concept or situation through authentic practice.

Another key feature of the experiential learning process is that it is a “recurring cycle” (Kolb, 1984) which builds upon itself and leads to additional ideas and questions that guide the learner to further explorations, thus resuming the experiential learning cycle. As John Dewey discussed in *Experience and Education* (1938), previous experiences influence current experiences, and thus impact future experiences. Therefore, by providing learners with opportunities to fully engage in the experiential learning cycle, the knowledge and understanding gained through one experience will progress toward future learning.

While there are several published experiential learning cycles with diverse numbers of stages (three, four, or five) (Kolb, 1984; Pfeiffer & Jones, 1985; Marek & Cavallo, 1997; Usher, Bryant, & Johnston, 1997), they all share similar attributes, and the

number of stages is not imperative. What is important is that each cycle provides opportunities for connections between previous, current, and future experiences and between the learner and the environment (Dewey, 1938). Furthermore, the active reflection and the application of knowledge to authentic situations, essential components of the process, are attributes that make experiential learning distinct and more compelling than the models commonly referred to as “learn-by-doing” or “hands-on-learning” (Proudman, 1995).

Addressing 4-H Volunteers’ Understanding and Use of Experiential Learning through Effective Professional Development

The utilization of the experiential learning model in 4-H programming efforts is one of the long-standing tenets promoted by faculty and county-based staff within the 4-H Youth Development Program (McArthur, Shields, & Zurcher, 1987; Horton & Hutchinson, 1997; Horton, Hutchinson, Barkman, Machtmes, & Myers, 1999). However, according to Diem (2001), 4-H volunteers need to understand the experiential learning process in order to use it effectively. Thus, Cooperative Extension academics from the University of California assessed volunteers’ understanding and use of experiential learning in their county programs. Interview data were collected from 4-H volunteers in San Diego, Santa Barbara, and Santa Cruz Counties. Interviews queried volunteers about specific activities, projects, or programs they led, how they were delivered to youth, and the volunteers’ roles in the learning process. Representative interview responses included:

- “Have a leader demonstrate ...”
- “I answer questions; I supervise.”
- “I demonstrate; kids observe; they try it; and then we discuss.”
- “I do; they do.”
- “I orally go through the process [and then] demonstrate.”
- “Watch me, I’ll help you, [then] you’ll do it.”

The analysis of interview data led researchers to concur with Enfield (2001) who reported that the demonstration model prevalent in the early stages of

the 4-H Program over 100 years ago still shapes the way 4-H projects and programs are delivered today.

4-H Volunteer Development: Understanding and Applying Experiential Learning

Based on results from the interviews with 4-H volunteers, and with the goal of increasing 4-H volunteers' awareness, knowledge, and use of experiential learning, participating researchers tested, evaluated, and published a series of three experiential learning workshops (Enfield, Schmitt-McQuitty, & Smith, 2007; UC-STEL, 2005). The workshops scaffolded upon one another and provided volunteers with essential information and experiences necessary to enhance their knowledge and abilities to more effectively integrate experiential learning opportunities in the projects and programs they led. The workshops were content area independent, used the five-step learning cycle, and followed an incremental design that targets the scaffolding of participants' confidence and competence (Smith & Enfield, 2002). Each workshop ranged in length from 2 to 3 hours and provided participants with relevant experiences to hone their understanding and application of experiential learning.

Workshop I: Understanding Experiential Learning

The focus of Workshop I was on participants' understanding of experiential learning and the five-step learning cycle through the use of hands-on activities, structured reflection, and modeling through practice. The organization and subject matter of the workshop were adapted from McArthur, Shields, & Zurcher (1987), and provided participants with opportunities to relate experiential learning and the learning cycle to the delivery of projects and programs with youth audiences.

Workshop II: Inquiry-Based Learning and the Experiential Learning Cycle

Workshop II was designed as a sequential follow-up to Workshop I. Workshop II reinforced the concepts of experiential learning and the learning cycle while focusing on strategies to incorporate inquiry into the experiential process. The workshop targeted

participants' understanding and use of inquiry-based instructional methods and differentiated between hands-on learning and hands-on learning using inquiry.

Workshop III: Developing and Adapting Curricula to Integrate Experiential Learning

Workshop III built upon participants' understanding of the concepts put forth during Workshops I and II. Participants applied their knowledge by reviewing and evaluating published curricula for elements essential to experiential learning and inquiry strategies (e.g., open-ended questions, opportunities for reflection, authentic applications). Furthermore, they learned to make modifications to existing curriculum materials in order to include elements of inquiry and experiential learning by using the "Backward Design" approach (Wiggins & McTighe, 1998).

METHOD

Sample

A total of 120 volunteers participated in Workshop I, 41 participated in Workshop II and 29 participated in Workshop III.

Data

Surveys inquired into whether participants improved their knowledge of experiential learning, their understanding of inquiry, and their knowledge of curriculum development strategies. Open-ended questions were also included for all three surveys.

Analysis

Descriptive statistics was used to measure participant ratings of workshops. Qualitative data from the open-ended questions was analyzed for main themes that elaborated participant assessments regarding improvements in knowledge, understanding of inquiry and knowledge of curriculum development strategies.

RESULTS

Survey data were used to assess the efficacy of Experiential Learning Workshops I, II, and III

(Enfield, Schmitt-McQuitty, & Smith, 2007). Outcome data indicated that 99% (n = 120) of the individuals who participated in Workshop I improved their knowledge of experiential learning, and that 94% of the participants were confident in their abilities to apply experiential learning to their own work with youth. Participant responses from open-ended questions included:

I feel more confident about applying the experiential learning model.

Now that I've done [the workshop] I feel confident enough to try it [EL] out.

Individuals who participated in Workshop II also showed strong gains in their understanding of targeted concepts. Prior to Workshop II, only 8% of the participants (n = 41) rated their understanding of inquiry as "very good" or "excellent," whereas after the workshop this increased to 67%. Additionally, 80% of the participants indicated confidence in applying inquiry-based methods to activities in their 4-H program as a result of taking part in Workshop II. Representative feedback from participants consisted of:

I feel confident enough to begin applying inquiry-based instruction at project level and would like to share what I learned with other project mentors in my club.

I feel that I can go and do a presentation on it [inquiry] with my own group.

Outcome data from Experiential Learning Workshop III revealed that 97% (n = 29) of the participants increased their knowledge of curriculum development strategies. Furthermore, those individuals who ranked their knowledge of curriculum development as either "very good" or "excellent" increased from 7% on the pre-survey to 62% on the post-survey. Participants' comments included:

It actually makes sense to work backwards. If you know what your goal is you can establish the steps to get there.

Because it makes me think of the end result and what the kids will get out of it.

It will help me to evaluate curriculum and design activities.

Extension Efforts

The extension of knowledge is a critical component of the Cooperative Extension model and in developing best practices around effective training methodologies and professional development. Since the initial outcome evaluations were conducted, experiential learning workshops have been presented to more than 600 additional educators representing formal and non-formal education programs in the fields of youth development, nutrition education, environmental education, and in university teaching methods courses. Additionally, to help maximize the exposure and reach of Experiential Learning Workshops I, II, and III, a comprehensive website was developed (<http://www.experientiallearning.ucdavis.edu/default.shtml>) to further extend efforts beyond the California 4-H Youth Development Program, and to expose other educators and programs to these resources. The multifaceted website features pedagogical and theoretical information about experiential learning and provides tools, resources, and module outlines for use by other educators.

Feedback from educators who have participated in extension efforts and/or used the experiential learning website have shared the following:

... Skills acquired [for] experiential learning and inquiry are in many ways, more important than the content. This is an important point that should be highlighted even more. Teachers often get swept away with content and forget the skills.

I just wanted to thank you for the wonderful information on your website! It looks like you are all doing incredible work. I was looking for information on Malcolm Knowles and Google sent me to your site. As an educator for professional dementia caregiver I use the theories of experiential learning in my learning opportunities, I was thrilled to read about how you all are using them with children.

I learned to ask children more questions instead of just giving answers.

I really appreciate your website about experiential learning. In particular, I like the steps and explanations of the experiential learning process

and the characteristics of students by age group and tips for teaching experiential learning.

I've gained an understanding of the difference between hands-on and experiential learning. Experiential learning puts the experience in a relevant context for students through incorporating reflection and application.

I'm struggling to make a very different looking special education classroom fit the requirements of a more traditional high school. I was going to develop my own lesson plan form based on what I've read/found but yours is perfect.

It became clearer to me on how to let the learners solve problems and find their own solutions.

It is [the website] by far the best resource for experiential learning I have seen to date!

This workshop gave me a broader focus on what I can do and methods I can use to teach my projects.

DISCUSSION

The 4-H Youth Development Program has exhibited and continues to display limitations with respect to its use of experiential learning. For many years, 4-H educators have developed and provided project materials for 4-H members and volunteers that have been designed in an experiential manner that allow learners to engage in hands-on activities in order to both practice and apply skills. However, Horton and Hutchinson (1997) state that most of these project materials have focused primarily on instructing 4-H members to do or make something. Enfield (2001) posits that this is a result of the continuation of the demonstration model that was prevalent in the early stages of the 4-H Program detailed earlier in this chapter. Enfield (2001) states that, "Young people involved in Boys and Girls Agricultural Clubs and early 4-H Clubs were certainly involved in producing things of value to them, their families, and in many cases, their communities; additionally, they were undoubtedly involved in 'hands-on' or 'learn-by-doing' activities and projects." Enfield goes on

to discuss that Dewey and other educators (e.g., Proudman, 1995) have indicated that experiential education goes beyond "hands-on" learning or "learning-by-doing," and that "hands-on" does not always translate to experiential learning. Experiential learning must, by design and through implementation, include opportunities for reflection and application that help lead learners to a deeper and more thorough understanding of targeted learning objectives.

As the 4-H Youth Development Program moves further into the 21st century it will be increasingly important to continue to address the diverse needs of 4-H Youth Development Program participants while learning from and building upon foundational elements that have made 4-H successful in the past. One need among all youth audiences is to effect true learning and real understanding through the use of experiential learning opportunities. However, to achieve this will require well-trained and skilled volunteers. This can be accomplished through a systematic and intentional approach to professional development focused on experiential learning involving the use of sequential workshops that model effective practice and scaffold knowledge and skills over time. Thus, by drawing upon their current understanding of "learning by doing," we can expand volunteers' knowledge and improve their abilities to deliver effective educational programming through self-discovery and self-affirmation (Enfield, Schmitt-McQuitty, & Smith, 2007). This approach is supported by research outcomes (Enfield, Schmitt-McQuitty, & Smith, 2007) and is consistent with Dr. Seaman Knapp's philosophy on extension education from the early 1900s (Bull, Cote, Warner, & McKinnie, 2007; Enfield, 2001).

CONCLUSION

Volunteers are essential to the 4-H Youth Development Program, serving most commonly as nonformal educators who lead projects and activities with youth (Boyd, 2004; Stedman & Rudd, 2006). Approximately 14,300 adults are involved as 4-H volunteers in California on an annual basis (California State 4-H Office, 2010), and in order for them to be successful in their role as nonformal educators using experiential learning, they must have access to and

participate in effective professional development opportunities (Diem, 2001; Hoover & Connor, 2001). The workshops outlined in this chapter represent research-based strategies that can be used by 4-H staff to help volunteers improve their knowledge and skills associated with experiential learning and apply them to their work with youth audiences. Furthermore, the contents of these workshops have become foundational components of other volunteer training opportunities in California 4-H (e.g., Junge, Mahacek, Schmitt-McQuitty, & Smith, 2008; Junge, Manglallan, Reilly, & Killian, 2009) and have also been used to guide the development of new experientially-based curriculum materials (e.g., Smith et al., 2009; Smith et al., 2010).

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Volunteer Leader Development - Digest and Modules

Jane Chin Young and Carla Sousa

The California 4-H Volunteer Development Workgroup was organized to provide volunteers with foundational resources necessary to be effective leaders with youth. Preliminary assessments and reviews led the workgroup to design an innovative training program centered on the development of a core publication entitled the 4-H Project Leaders' Digest. The publication was subsequently supported by thematic train-the-trainer modules designed for delivery by staff and volunteer management teams. Evaluations and surveys indicate the resources and trainings are current, relevant and practical.

Effective youth development programming requires a solid investment in the development of volunteer leaders and staff members. To maximize the vast volunteer base that is available to 4-H, the Volunteer Development Workgroup, comprising county based academics and staff from the statewide 4-H youth development program, was organized to develop resources which provide volunteers with foundational components based on current research and practices.

In this article we first describe the development of two volunteer development resources, namely, the 4-H Project Leaders' Digest and training modules to support key topics of the Digest. Second, we share the results of its impact for professional development of staff and volunteers.

Training Resources for Volunteer Effectiveness

The workgroup reviewed the literature on volunteer development and identified six elements as being critical for meeting the needs of volunteers today: evaluation, management, motivation, recruitment, recognition and training. This review focuses on the literature examining the process and content of

training – on which the development of the Digest and subsequent training modules was based. Training is critical for volunteer effectiveness (Van Winkle, Butler, Bowman, & Manoogian, 2002). Effective training is important to achieving the mission of an organization, whereas poor or inadequate training can harm an organization (Kaslon, Lodl, & Greve, 2005). An effective training program includes a variety of delivery methods, such as short, timely experiential workshops (Ami, Zinger, & Ashkenazy, 2003), practical written materials, and on-line lessons that provide consistent training across a wide geographical area (Kaslon, Lodl, & Greve, 2005).

Research suggests that training is essential to planning and implementing youth development programs (Snider, 1985; Hoover and Conner, 2001; Van Winkle, Busler, Bowman, & Manoogian, 2002; Smith, Meehan, Enfield, & George, 2004). Without effective training, written materials such as the Digest would not fully develop the capacity of volunteers to implement youth development principles. Studies also point to the importance of developmentally appropriate learning, as well as indicate the need to include strategies for authentic application to enable practitioners to improve on what they do (Silliman, 2007). As 4-H project curricula are typically organized around specific age groups, the first step in the training design was to build the understanding of developmental characteristics. Research relates developmental characteristics of youth that are both linear and dynamic (Katz, 1996). Understanding the domains (e.g., physical, cognitive, emotional, social)

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effectively can improve volunteer knowledge and skills (Silliman, 2007). Curricula developed with age appropriate considerations have proven effective in the California 4-H Youth Development Program, with projects such as Youth Experiences in Science (Ponzio, Junge, Manglallan, & Smith, 2000).

The Development of the 4-H Project Leaders' Digest

As a preliminary step, the workgroup collected and reviewed volunteer development resources being used at the time from the county based staff, including orientation. It was assessed that most county training resources were focused on policy, and that volunteer development would be best accomplished first with substantive staff development. The next step was conducting a staff survey regarding the types and effectiveness of "volunteer management teams" and "volunteer development systems" that exist in county-based 4-H YD programs in California. Data from staff statewide suggested that as the field of youth development evolved over the past decade, the materials available for volunteer development in California had not kept pace with current research and practice. In addition, there was not a single, consistent foundational resource being used by counties throughout the state. The Project Leaders' Digest was developed based on the literature around positive youth development content that volunteers need to be effective in their work with young people. The purpose of this new guide was to shift from a focus on policy to one of positive youth development.

The final version of the Digest resulted in a visually attractive twelve-page guide with principles applicable not only to 4-H, but also to other youth development programs and organizations. Themes included: essential elements of 4-H youth development; citizenship, leadership and life skills; experiential learning; learning styles and strategies; youth characteristics; teaching opportunities; youth adult partnerships; and safety. The format for each section includes an introductory paragraph, basic concepts, and an "Apply What You Have Learned" box. The centerfold of two pages is specific to 4-H volunteer leaders regarding common terminology, participation requirements, structures and activities.

The guide is available at: <http://www.ca4h.org/files/4462.pdf>

The Digest was distributed to staff and volunteers at two different conferences attended by each of these audiences. A subsequent step resulting from the success of the publication was the development of training modules to support the Digest topics.

The Development of the Project Leaders' Digest Training Modules

The Digest modules were created as a response to staff feedback for support information needed to complement the Digest. The workgroup began the task of developing modules to accompany four of the eight topics in the Digest. The first topics for which modules were developed were: working with 4-H members (youth characteristics); citizenship, leadership and life skills; project planning; and project meeting. Based on the literature review, a train-the-trainer format was selected, initially for staff to use with volunteer teams. Each module included a Power Point presentation and presenter's guide, with companion educational tools such as activity handouts, matrices, an evaluation tool, and supplemental resource information. Each module training delivery was designed to be delivered in an hour and 15-minute period.

Sub-teams were assigned to focus on the development of each of the four modules, with field testing conducted in each staff member's respective county. Simultaneous to the county field testing, the project meeting module was piloted at two 2007 events: staff development training in San Diego with twenty-five participants representing primarily the southern region of the state, and the State Leaders' Forum in Asilomar with adult volunteers and participating staff. Of the 4-H staff participating in the San Diego conference, 65% strongly agreed that the workshop would be relatively easy for them to present. 80% strongly agreed that many volunteers with whom they worked with would benefit from such a workshop. Volunteers at the Forum expressed that this type of training was needed in every 4-H community club and liked how positive youth development concepts could be introduced in a

meeting format. The task that followed was revising and editing.

For introduction and additional input, the workgroup team made a featured presentation in 2007 at the Statewide Staff Development Day held at UC Davis. The workgroup members facilitated breakout sessions on each of the four topics for discussion with 4-H staff, with comments incorporated into the development of the modules.

Rollout of the Digest Modules

After the final versions of the modules were completed, the first formal roll out of the train-the-trainer training for staff took place in fall 2008. Four identical deliveries were conducted throughout different parts of the state, starting with the north, continuing with the north central and central valley, and ending with the south. Presented by workgroup members, each training was held over two consecutive half days, with two modules presented each half day. As the workgroup members had intended for the training, participants were actively engaged. Participating staff had the opportunity to debrief and discuss how to incorporate the educational tools into their county programs.

I. METHOD: 4-H PROJECT LEADERS' DIGEST EVALUATION

Data

In 2009 an evaluation tool was created by the workgroup to evaluate the use of the 4-H Project Leaders' Digest at the county level. The staff evaluation tool was revised for volunteers and made available at a state teen leadership conference, as well as posted on-line, with hard copies also available at the county level. The volunteer survey was comprised of eight questions regarding usefulness and applicability of the Digest to their work. There were two multiple choice questions, one regarding how the publication had been acquired and the other about choices for future trainings as a follow-up to the Digest. The survey included six open-ended questions, including questions on how the volunteer might use

the publication with their work with other volunteers and suggested topics that might be useful for future editions of the Digest. An additional question gave volunteers an opportunity to make general comments.

Sample

The workgroup gathered data from staff and 4-H volunteers on the effectiveness of the Digest. There were 43 staff responses (representing 57% of staff in the state). 65 volunteer respondents represented 40% of the counties, both urban and rural, and primarily from the north central and central valley regions of the state. Approximately 70% of these leaders responded on-site at the teen leadership conference at UC Davis, with the remaining 30% responding online.

Analysis

Data were analyzed through descriptive statistics and by coding the qualitative information into main themes.

I. FINDINGS: 4-H PROJECT LEADERS' DIGEST

Staff Impact

Staff generally were very satisfied and gratified with having a single consistent statewide publication for volunteer development. The area of greatest staff impact was for new leader orientation, with ninety-five percent of the staff respondents indicating that they used the Digest for this type of training. Overall impressions were that the document was needed and well-timed, providing policies, current youth development principles and trends, and examples of theory put into practice.

Volunteer Impact

Volunteers who responded to the survey were generally pleased with the publication, particularly for new leaders. Many respondents also indicated that having many elements in a single publication was very helpful. Some quotes from leaders:

"Great document - I would think every adult involved should have a copy."

"It made most of the policies and guidelines available in one document."

"It helps leaders in the course of leading."

"It's a great introduction for new leaders/clubs. I think more training would be helpful."

Volunteers suggested a variety of trainings for the modules, both on-site and online.

The overall response by both staff and leaders was that the Digest was relevant, applicable, and professional in appearance, and they were interested in gaining online access to the document as well as customizing it to suit their needs. This validated a statewide need to make information available in ways beyond hard copy distribution in the county. As a result, the Digest was made available routinely at statewide and regional events, and eventually online as a free downloadable publication.

The survey data provided evidence of positive acceptance of the Digest by both staff and volunteers as a statewide publication for all counties. In addition, there was general support for training that validated the workgroup's intention of proceeding with the development of training modules to support the publication's themes.

II. METHOD: 4-H Digest Training Modules

Approximately 50% of the staff statewide participated in the rollout training for staff development. In 2010, 57% of the staff participated in a follow-up survey regarding their use of the Digest modules in their counties, regardless if they had participated in the 2008 trainings.

Data

At the 2008 statewide trainings, a standard evaluation form was given to staff participants at the completion of each module delivery. In addition to asking for the number of years of service, the evaluation included seven questions. Five questions included a Likert scale of four rankings from strongly agree to strongly disagree, requesting ranking the modules for format, ease in presentation, and plans for use in the next year. There were two open-ended questions regarding barriers and delivery.

Sample

During the spring of 2010 a follow-up statewide survey on the use of the Digest modules was conducted, resulting in responses from 41 staff (54%). This survey gathered staff data on the county use of the modules and their effectiveness.

Analysis

Survey responses were analyzed using descriptive statistical techniques. Qualitative responses regarding barriers and delivery were coded into main themes.

II. FINDINGS: 4-H Digest Training Modules

Staff impact

Table 1 shows evaluation results from staff participants from the 2008 trainings at four sites. The score is based on a Likert scale (1 - strongly disagree and 4 - strongly agree). These scores reflect that a majority of staff either agreed or strongly agreed that

TABLE 1
Showing mean participants ratings on modules training

	<i>Citizenship, Leadership, and Life Skills Module</i>	<i>Project Meeting Module</i>	<i>Project Planning Module</i>	<i>Working with 4-H Members Module</i>
Training easy to follow	3.5	3.3	3.5	3.6
Easy for me to present	3.2	3.3	3.3	3.3
Easily make changes	3.4	3.4	3.4	3.2
Plan to conduct in next year	3.4	3.4	3.3	3.1

the training was easy to follow, that the modules were flexible enough to customize or make changes, and that they were planning to train volunteers using these modules within the next year. The highest score for the ease in following the training indicates strong satisfaction for the delivery of the training. The lowest score is for ease in presentation. General comments noted that there was repetition of key elements and types of activities amongst several of the modules. Each module was designed to function as a stand-alone piece, and was delivered as such in consecutive fashion. Results from staff in the 2010 survey on their use of the modules is shown in Table 2.

Noteworthy in the results from this survey is that many staff adapted the modules. As one staff person said, *"The modules have been very helpful and have made it easier to plan and adjust my own trainings and orientations."* This adjustment demonstrates the flexibility of the modules, but at the same time, poses the question of whether the modules might benefit from updating or modification, particularly for different audiences. In addition to training community club volunteers, several staff have modified the core

modules for volunteers with special interest groups as well as for teen leaders working with younger members.

With a two year period for implementing the delivery of the modules in counties, the 2010 survey data indicated that the modules are being used, with the project planning and meeting modules used more often. The comments regarding repetition amongst the modules gives the workgroup cause to consider deliveries that are consolidated or abbreviated. Further data collection on the adapted use of the modules might be helpful in determining the future direction of the modules. With the passing of two years of staff only access for the modules, the workgroup determined in summer of 2010 to make the modules available to volunteers and the public through the State 4-H website.

DISCUSSION

Results of this project support previous research on staff and volunteer development. Much of our experience supports the research that adequate and effective training is important. The Volunteer

TABLE 2
Showing staff responses on surveys regarding Volunteer Development Modules

Check the Volunteer Development Modules you have used. (Response rate = 49%)

65%	Project Planning
55%	Project Meeting
45%	Working with 4-H Members
50%	Citizenship, Leadership and Other Life Skills

Do you find the training modules most useful if you: (check all that apply) (Response rate = 54%)

23%	Use the Presenter Notes and supporting materials as designed
36%	Modify the digital presentation and Presenter Notes.
41%	Modify the supporting materials.

Please rate the materials and presentation format of the training modules. (Response rate = 39%)

13%	Poor
0%	Fair
56%	Good
31%	Excellent

Please rate the impact the training modules have had in your county.

6%	Poor
25%	Fair
50%	Good
19%	Excellent

Development Workgroup aims to provide consistent, ongoing training to 4-H volunteers that is based on the latest research in youth development. The 4-H Project Leaders' Digest has provided staff, volunteers and youth professionals with a peer-reviewed, research-based publication supported by modules that are current and consistent statewide. Staff and volunteer responses have indicated the resources were needed, timely, and well-developed. The Digest has been sought by Extension in other states as a resource. In June 2009, the workgroup received the NAE4HA Western Region Team Award for Excellence in Club Support.

The acceptance and use of the modules appears mixed, though it is generally well-received by those who use it. Unlike the Digest, the modules were not introduced at a statewide conference that reached both staff and leaders. Also unlike the Digest, hard copies of the modules were not sent directly to each county office, but instead, given only to staff who attended on-site trainings. In addition, the modules, unlike the Digest, require training to be used. Research indicates that there is a growing acceptance by volunteers and a willingness to explore alternative deliveries for training beyond traditional methods (Kaslon, 2005). Unfortunately, the format for the modules training has been essentially a single method of delivery, face-to-face, with the training series lengthy when used in its entirety. Though the overall response from staff and volunteers on the modules is generally positive, the information only reflects those who have participated in the training, which is approximately half of the statewide 4-H staff. As a result, the modules are not reaching their full audience potential. One possible factor for this lack of use of the modules may be its design as a train-the-trainer resource for county teams, rather than for direct delivery. As noted in the most current staff survey of the modules, more staff modify the modules and its supporting materials than use it as is. This indicates that the modules might be modified or enhanced for more effective staff use. Another consideration for when there are reduced staff resources and increased responsibilities is that developing and maintaining volunteer development training teams may not be a reasonable or realistic goal for county staff. Alternative deliveries for

implementing the modules might increase their use in counties.

The transition of the State 4-H Youth Development Program from face-to-face trainings to more virtual communications will include the increased use of technology to reach both staff and volunteers. Immediately after the statewide modules training rollout, workgroup members experimented with the use of online technology as a delivery alternative with the "working with 4-H" module. This module was selected due to its strong information base that lends itself more to online delivery. Though the participants responded very favorably to this delivery as an alternative, the challenges with carrying out interactive activities online is affected by limited access to participants and the high technical skill level needed by the participants as well as the facilitators. Though limited in its delivery, online delivery is promising as a feasible, cost-efficient option, particularly as staff increase their technology proficiency.

CONCLUSION

The Project Leaders' Digest has been made available to the public as a free downloadable publication via the State 4-H website. In July 2010, the modules were released on the website for public access, with the intention that county staff work with volunteer teams to implement the modules training. The site is located at: http://www.ca4h.org/Resources/Volunteers/Project_Leader_Resources/

Further information is needed to assess the impact of the Digest and modules on staff effectiveness with volunteer development training. In addition, with the release of the modules online for public access, information regarding expanded use of the modules by the volunteers and the public needs to be collected.

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