Vol 1 • Issue 2 • Spring 2015

The Journal of Expanded Learning Opportunities

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Researcher and Practitioner Dialogue: Building Networks and Systems

Examining Levels of Alignment Between School and Afterschool and Associations with Student Academic Achievement

Expanding Common Core Learning Opportunities Through Professional Learning Communities in Afterschool Program Networks

Science in California's Public Afterschool Program: Exploring Offerings and Opportunities

The Journal of Expanded Learning Opportunities
JELO

JELO Editorial Board Members

Welcome to the second issue of *The Journal of Expanded Learning Opportunities* (JELO)! The JELO is a peer-reviewed, online, open access publication of the Central Valley Afterschool Foundation.

The mission of this journal is to foster the discovery, collection, and dissemination of scholarly research and deeper learning from a variety of disciplines related to out-of-school-time or expanded learning time. By publishing original empirical, practical, and theoretical manuscripts, the JELO promotes scholarship and consciousness of the ways in which young people's engagement in expanded learning activities contributes to their learning and development. Ultimately, the JELO seeks to connect research and promising practices throughout the nation, with a particular focus on California, fostering a dialogue that engages researchers and practitioners in the field.

This second issue of the JELO features a dialogue between Michelle Perrenoud, of Los Angeles County Office of Education, and Dr. Deborah Vandell, of University of California, Irvine, on the topic of the networks and systems which support the expanded learning field. We are also proud to feature three articles that focus on the value of networks and systems. Two articles discuss the importance of on-going communication between school day and afterschool providers to maximize student impact. Our third article articulates the importance of staffing structure, staff knowledge, and external partners as key factors associated with effective inquiry-based science opportunities in expanded learning programs.

Since the launch of the first issue in the Spring of 2014, we have engaged in both statewide and national conversations about expanded learning. Much of the discussion has focused on how to bridge the divide between research and practice, as well as raising awareness of the JELO as a resource.

We thank you for your commitment to expanded learning and your ongoing support of this thriving field.

Kimberley Boyer, Ed.D
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Matilda Soria, Ed.D
Associate Editor
Reading and Beyond

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RESEARCHER AND PRACTITIONER DIALOGUE

with Deborah Vandell, Ph.D – *University of California, Irvine*

and Michelle Perrenoud – *Los Angeles County Office of Education*

The expanded learning field is making great strides to spread new knowledge and promote program quality to the field's leaders and practitioners. To achieve this goal, many researchers and practitioners in the field are looking closely at building networks and systems. In this issue of the JELO, Dr. Deborah Vandell from the University of California, Irvine (UCI), and Michelle Perrenoud from the Los Angeles County Office of Education (LACOE) share their ideas on networks and systems. Dr. Vandell is a Professor and founding Dean of the UCI Department of Education. Ms. Perrenoud is an afterschool Project Coordinator for LACOE. Dr. Vandell is representing the researcher perspective and Ms. Perrenound is representing the practitioner perspective.

In the expanded learning field (which includes afterschool and summer), there are a lot of discussions around building "networks" and designing "systems". What do you see as the key differences between networks and systems?

Deborah: *For me, "networks" refer to connections between various afterschool programs that can provide technical assistance and mutual support. The CA Afterschool Network is an example of such a group. For me, "Systems" refer to inter-locking relationships that are connected across multiple levels. Building an afterschool system would focus on connections among afterschool and school, afterschool and parents, and afterschool and the community. Another way to think systematically is to look at the connections between afterschool and various local, state, and national policy initiatives. Thinking systematically also leads people to consider how these external forces influence what happens within programs as well as individuals sites.*

Michelle: *In my opinion, networks are groups of people with unique perspectives, like interests and shared passion linked together in a unity of purpose. Often these groups work to fill a need currently not being sufficiently addressed, lacking adequate funding/ resources, or in need of a formal system to support efforts. A network (such as a community of practice, local learning community, scholarly society) provides a forum for like-minded individuals to come together, share knowledge and learn from one another while discussing issues and ideas, challenging assumptions*

and roadblocks, envisioning a brighter future, bridging current realities and creating informal, but shared, supports to address immediate needs, next steps, and discover promising practices. Additionally, the work of a network (such as an advocacy group) further informs practice, policy, and programs.

To me, a system is a well-defined methodology or program used consistently in order to reach a designated end result. Within a system, a group of elements, or people, interact and function together as a whole as specified by formal (or informal) institutional procedures and processes. A system can also exist for the purpose of providing people access to resources and disseminating information to a larger group of individuals. Backing at the highest level within the authorizing agency is necessary, along with adequate financial support, intentional resources, and a thorough infrastructure.

As a researcher or practitioner, who/what are your key networks? How do those connections help your work?

Deborah: *As a researcher, I am part of several networks that share information and findings about afterschool and summer learning. We sometimes engage in collaborative studies, such as the one that I conducted with research colleagues last year as part of the Power of Discovery: STEM2 Initiative. I have been a part of an early childhood research network for more than 20 years and much of the research by that group has been done collaboratively. There is power in networks!*

Michelle: *My key networks include: California After-School Network, Learning In After School and Summer, BOOST Collaborative, and UCLA Educational Leadership Collaborative.*

Each of these networks is a trusted convener of leaders, scholars, policymakers, practitioners and educators who work within, or are connected to, expanded learning. These networks provide robust opportunities for discourse, creating opportunities for innovation by connecting multiple levels of stakeholders and perspectives. Their work helps all those involved to better understand the nature of environmental shifts and proactive, dynamic, collective action. Each group also informs the field with resources, strategies, professional growth opportunities, and connections between research, leadership, and practice. These networks are a place where I belong as a learner and contributing member.

As a researcher or practitioner, describe a current system in which you are involved? How does this system help your work?

Deborah: *Systems are also powerful, but in a different way. Systems are characterized by their horizontal and vertical connectivity to other areas. Another important aspect of systems is the recognition that, when you change in one part of a system, other aspects of the system (and other connections) also are impacted. When one aspect of the afterschool system is changed (by funding, by quality standards, by what's happening the schools), those changes ripple across the afterschool system.*

Michelle: *I am involved in several systems that help my work and inform the field, two include: the CDE Statewide System of Support and the Region 11 System of Support.*

The most recent system design in which I am involved is the California Department of Education After School Division Statewide System of Support as a member of the Policy Guide Committee focusing on SB1221 (http://partnerforchildren.org/wp-content/uploads/2014/07/SB-1221-Hancock-Expanded-Learning-Enhances-Student-Success-7-24.pdf) and the implications to our work both statewide and locally. This committee was formed to develop, implement and maintain clear policies that support quality programs. Expanded Learning program policies will include the regulatory source and corresponding levels of program accountability. The Committee will also develop and implement a timely and collaborative process for reviewing, revising, and notifying the field of new and existing policies. These elements will interact and function together to provide a system of support to the field within a larger network of committees additionally focused on designing supports.

I am also involved in coordinating and managing Region 11 Technical Assistance Coaching Site Visits in Los Angeles County on an annual basis to assess technical assistance needs of Expanded Learning programs. This system is comprised of two key elements to establish a comprehensive and coordinated coaching technical assistance structure to raise the quality of Expanded Learning programs in Region 11. The elements include: (1) a web-based tool and set of coordinated resources for site coordinators, program directors, and reviewers to utilize while entering specific data for discussion during the visit and (2) a cadre of trained reviewers who provide real-time coaching and support

that addresses needs and challenges of the program site at the time of the visit. The long-term benefits of this system include providing a framework and data the program site can use to inform their continuous quality improvement planning process.

In general, what are the strengths and limitations of networks for expanded learning? What are the strengths and limitations of systems for the field?

Deborah: *Both networks and systems have strength in their collaborative work. As research continues to grow in these areas and the more collaborative work that takes place among networks and systems, the less the limitations we will have.*

Michelle: *While networks and systems are composed of differing elements, they can co-exist in a symbiotic relationship. Networks often mobilize faster than systems and are more adaptable due to infrastructure that is more fluid and adjustable. Systems can cause delays as a result of policies and protocol due to additional steps beyond what is done at the network level. In light of the transition taking place within our field, from afterschool to expanded learning both networks and systems are necessary to support the progression of our discipline and to achieve desired outcomes. Without the networking piece informing the interplay of systems development, we are not going to see quality improved just because systems are in place. The heart of a network (its people) work together to inspire a shared vision and to design systems that will enable others to act purposefully.*

What more do we need to learn about networks and systems for expanded learning? What are the top three research/practice questions that the field needs to address at this time?

Deborah: *Much of what we need to learn about networks and systems connects with the research questions I'd like to see addressed in our field. One timely research question that I would like to see pursued is how we can better link early childhood, afterschool, and summer programs. Relatedly, I would like to see more systematic research identifying what are effective models for conceptualizing relations between afterschool and school. Finally, there remains a need to research ways in which afterschool networks can support professional development in afterschool programs that vary widely in their maturity and capacity.*

Michelle: *More than ever before, as the California AfterSchool Network states, we need to Lead Strategically, Work Collaboratively and Act Intentionally.*

Items needing to be addressed:

- *Operational definitions of networks and systems as they apply to our work.*
- *Understanding the nexus between networks and systems and how they work together.*
- *What should a network be defined as in the field of Expanded Learning?*
- *Starting to differentiate what networks look like and what purposes they serve and how and when they are useful in practice.*
- *Systems supporting the advancement of Expanded Learning and the implementation of policy initiative like SB 1221 in California.*
- *Creation of networks and systems supporting professional growth of site-based staff (site coordinators and frontline staff).*

EXAMINING LEVELS OF ALIGNMENT BETWEEN SCHOOL AND AFTERSCHOOL AND ASSOCIATIONS WITH STUDENT ACADEMIC ACHIEVEMENT

Research-Based Article

Tracy Bennett, Ph.D – *University of California, Irvine (in partnership with THINK Together)*

Abstract

In recent years, attention has been given to the academic impact of afterschool programs. Some schools collaborate with afterschool programs in an attempt to align the learning that occurs during the school day with the learning that occurs during afterschool hours, and thus maximize the potential to positively impact student academic achievement. However, very little research has sought to estimate the associations of alignment practices with academic achievement. This article proposes a conceptual framework of alignment between school and afterschool programs that incorporates measuring academic resources, communication, and a sense of partnership. It reviews the research on such practices, and synthesizes the work within the proposed framework. In statistical analyses, survey data were collected from principals and afterschool staff at 78 schools across 11 school districts in Southern California. Sites in the study were designated as highly aligned or misaligned. Results indicate a positive association between high alignment and academic achievement of students in both English Language Arts and Math, when compared with lower aligned sites. Significant negative associations were detected in Math when sites were misaligned. Results indicate the need for more research on the effectiveness of collaboration between school and afterschool.

Keywords: alignment, misalignment, afterschool, academic achievement

Introduction

Afterschool programming is playing an increasingly active role within the education system (Bodilly & Beckett, 2005). While the initial goal of afterschool programs was to provide a safe place for children to be after the school bell rings, accountability measures in education transformed the purpose of some afterschool programs from basic supervision to being responsible for contributing to the academic achievement of students (Mahoney, Parente, & Zigler, 2010. Specifically in the past decade, societal interest in afterschool programming has increased and efforts to expand the field have grown (Halpern, 2006). In an effort to promote development and learning during afterschool hours, schools may collaborate with afterschool programs. The overall goal of such efforts is to provide a complementary learning environment that provides students an opportunity to reinforce and practice skills (Afterschool Alliance, 2011). Complementary learning refers to staff at afterschool programs collaborating with staff at schools to align and maximize learning for students (Weiss, Little, Bouffard, Deschenes, & Malone, 2009). As the responsibility of afterschool programs grows, so does the need to examine which levels and types of alignment make programs effective at contributing to the academic success of students.

For the purposes of this research, the term "alignment" is used to describe specific collaboration practices between staff at afterschool programs and schools that attempt to coordinate learning as students transition from the regular school day to the afterschool program. These intentional alignment efforts have several dimensions including the degree of effort by either or both entities, resources available, and time dedicated to collaboration. The study presented here conceptualizes alignment across such varied levels as academic resources, communication and partnership, and then empirically examines the relationships between varied levels of alignment and student achievement.

Context of Alignment Between School and Afterschool Staff

School staff collaborate with their afterschool programs and other community-based organizations to create programs that can reach student achievement goals by capitalizing on each entity's assets, resources, and perspectives (Ashcraft, 2002). There are multiple potential benefits to partnerships with schools that focus on afterschool time. Little, Wimer, and Weiss (2008) assert that afterschool partnerships can provide and support diverse, quality services for students that the school may not have the capacity to sustain during the regular school hours such as tutoring, academic enrichment or physical fitness. Collectively, a school and afterschool program can develop a set of common capacities that will enable afterschool programs to function as high-performing and adaptable entities that create new opportunities for students, and a plan for learning that extends beyond the hours of the traditional school day.

Even though the afterschool hours can be used to promote learning, it does not necessarily mean that the afterschool program mimics the regular school day. Instead, afterschool programs may support academic achievement not by mimicking schools, but instead by supplementing the schools' academic focus with a more integrative approach, targeting positive youth outcomes across multiple domains (Adger, 2001). Some research affirms this approach, indicating that these programs can benefit students by decreasing their risk-taking behaviors and supporting the development of a range of non-academic competencies that in turn support academic learning and achievement (Hall, Yohalem, Tolman, & Wilson, 2003; Honig, Kahne, & McLaughlin, 2001).

An aligned afterschool program that is connected to the school would maximize learning for students (Weiss, et. al, 2009). To date, the hypothesis that high alignment between schools and afterschool programs will yield benefits for student academic achievement has not been tested. In such an effort, the main purpose of this research is to:

1. Develop a conceptual framework of alignment between school and afterschool that accounts for various levels of alignment practices
2. Empirically test a measure of alignment as a predictor of student academic achievement
3. Provide recommendations for future research in afterschool

Conceptual Framework for Measuring Alignment

A growing body of research documents positive outcomes associated with afterschool programming. When compared with non-participants, afterschool program participants in several recent studies demon-

strated significant positive changes in academic achievement (Lauer et al., 2006; Reisner, White, Birmingham, & Welsh, 2001; Klein & Bolus, 2002; Vandell, Reisner & Pierce, 2007). Academic outcomes include improvements in reading and math scores, higher rates of homework completion, and higher grades. Positive socio-emotional and developmental outcomes have also been associated with afterschool programming. Recent studies have reported significant findings associated with lower levels of behavioral problems, gains in social competencies including confidence and leadership skills, and increased levels of civic engagement (Durlack & Weissberg 2007; Lauer et al. 2006; Harvard Family Research Project, 2006 Mahoney et al., 2010 Riggs & Greenberg 2004; Vandell et al., 2007. The positive results reported in these studies indicate that attendance in an afterschool program was able to significantly predict positive changes in student-level outcomes.

A more limited number of studies have examined the relationships that exist within programs that can also affect student outcomes. For example, adult-child relationships are documented in some studies as a key element of a high-quality afterschool program, and one that can impact student achievement (Smith et al., 2010). While adult-child relationships may be an important component of a high-quality afterschool program, most research tends to overlook the adult-to-adult relationships; specifically the relationship between afterschool program staff and school administrators.

There are no experimental studies on the impact of alignment practices between schools and afterschool programs affecting student academic achievement, yet evidence of such positive impacts will likely become an essential element of program sustainability (Stonehill et. al, 2011). There are a few studies that correlate alignment practices with academic outcomes, yet there are no conclusive links between alignment practices and academic achievement.

In their book *Afterschool Education: Approaches to an Emerging Field*, Noam, Biancarosa, and Dechausay (2003) present a framework that delineates levels of relationships that can occur between afterschool programs and schools. Noam et al. view afterschool programs as a bridge between different worlds within a student's life; connecting the learning that occurs during school with the learning that occurs afterschool. These different levels of alignment are indicative of the intensity with which schools and afterschool programs implement certain practices or not. The strength of these practices places a program on a continuum of alignment. When a program is completely separate from a school, Noam consider it a self-contained program. In this case, both the program and the school make no effort to connect with each other. On the other end of the spectrum is a unified program that is indistinguishable from the regular school program. It would be a true extension of the school day, and contains no individualized characteristics distinct from the school.

Based on the framework Noam et al. (2003) provide for alignment, an integrated afterschool program would be considered highly aligned for the purposes of the current study. An integrated afterschool program makes it an organizational priority to allow time for collaboration between staff and school administrators. Furthermore, the school administrators invite the afterschool program staff to attend various meetings such as leadership, staff, and parent meetings. Also, school administrators are involved in afterschool program planning. While this framework is foundational in understanding alignment as a relationship between school and afterschool programs, it does not offer specific practices of alignment that can be implemented by practitioners or studied by researchers.

Expanding the Framework

Building on the framework provided by Noam et al. (2003), this research focuses on three particular alignment practices: academic resources, communication, and sense of partnership, which can be measured and studied. These areas of practice can vary depending on the degree of effort and intention that both the school and the afterschool program put into the relationship and alignment practices. The framework demonstrates that as the intensity and intentionality of alignment practices increase, an afterschool program would progress from self-contained (not aligned) to integrated (highly aligned). A unified program is not included in the framework because it implies no distinction between a school and an afterschool program and is therefore inapplicable to this research. The types of practices within each level of alignment are academic resources, communication, and partnership. Next, these three proposed areas of alignment are discussed.

Academic resources
This framework proposes that a key alignment practice is to coordinate the use of academic resources between the school and the afterschool program to ensure there is alignment of academic goals and strategies when students transition from school to afterschool. Curriculum design should be intentionally aligned to program goals (Huang & Dietel, 2011). Most often, schools have access to materials, facilities, and resources that could be made available to the afterschool program. A measure of alignment on academic resources would include an examination of which resources the afterschool program has access, and which resources are used in programming such as curriculum materials, computer lab access, curriculum pacing guides, student level data and teacher guides.

Communication
The framework discussed here suggests that the frequency and purpose with which schools communicate with afterschool programs is an important component of alignment. Regular and intentional communication provides school and afterschool staff with access to common information that will improve how each supports the development of students (Bosland, Rucker, Cohen, Fischer, & Rogers, 2012). A measure of alignment would need to be able to examine the frequency and content of such communication efforts. Based on the alignment practices discussed here, a measure of communication should address specific types and frequency of communication topics including academic concepts, student needs, facility use, program and school policies, and goal setting.

Sense of partnership
The framework proposed here notes a sense of partnership as a component of alignment between school and afterschool. This is especially important since many school-based administrators consider afterschool programs as an afterthought and may not connect it to the traditional school day (Norris-Holmes, 2008). Alignment includes the need for a strong relationship between the school and afterschool program that incorporates trust, shared vision, and common goals for students. Therefore, a measure of alignment should include an assessment of the relationship between the school and afterschool program, how that relationship builds alignment, and the process by which efforts are translated into programmatic efforts afterschool.

By incorporating these three proposed elements of alignment practices between school and afterschool programs into a measure that is applicable across varying programs and contexts, researchers can establish a foundation for future studies on alignment. This can provide valuable insight into the varying degrees of alignment that occur and the potential impact on student achievement. Table 1 provides examples of survey items under each component that a study could potentially use. Researchers can examine the components individually, or as a comprehensive measure. Furthermore, researchers can use the measure as a statistical predictor to student academic outcomes. Results would be comparable across multiple programs and contexts, which is a feature that is currently lacking in afterschool alignment research.

Measuring Alignment

Alignment is conceptualized as a relationship between the school and afterschool program, and therefore, both entities must be involved in the research. In its truest form, alignment entails a sense of understanding and dedication from both the school and afterschool program. Understanding the differences and varied approaches from both sides of the relationship will produce the most useful research for the field. Researchers must implement a measure of alignment with the intent to measure the efforts put forth by both the school and afterschool program.

Alignment is conceptualized as principals and afterschool site coordinators being in agreement about academic resources, communication, and partnership with the afterschool program at their school. Alignment is measured through surveys administered to principals and site coordinators of an afterschool program. A school is considered highly aligned if both the principal and the site coordinator report that they work together closely on all three types of alignment practices. Misalignment is conceptualized as those schools in which principals and site coordinators are not in agreement on all three of those categories. This study tests this measure of alignment as a predictor of student academic achievement.

In this study, a survey measure of alignment was administered in 11 school districts to determine if alignment is associated with student achievement. All of the afterschool program sites in this study are located in southern California. The study addresses the following questions:

1. Is alignment / misalignment between principals and site coordinators associated with student academic achievement scores in English Language Arts and Mathematics?
2. Is the perception of alignment by a single respondent (principal or site coordinator) associated with student academic achievement scores in English Language Arts and Mathematics?
3. Is the interaction of program attendance and alignment / misalignment associated with student academic achievement scores in English Language Arts and Mathematics?

Methods

Participants

Survey sample. Surveys were administered to principals and site coordinators at 116 schools across 11 districts. Eighty four principals and 91 site coordinators completed the survey. In 78 schools, surveys were completed for both sets of respondents (68% overall response rate).

Student sample. The sample consisted of afterschool program participants within Grades 3 through 8 at 78 schools (67 elementary and 11 intermediate) across 11 districts. Table 2 displays the demographic descriptive statistics of the student sample. After accounting for missing data, the student outcome sample consisted of 8,129 students. A majority of the student sample was Hispanic (54%), and there were more females than males (56%).

Measure

Alignment was assessed with items from a survey developed by Vandell and colleagues (2004). The survey contained three subscales: Academic resources, Communication, and Partnership. The reliability analysis conducted on each scale yielded similar alpha levels to the first study. Reliability analysis yielded lower alpha levels for Academic Resources (Principal α=.76, Site Coordinator α= .71), high alphas for Communication (Principal α= .89, Site Coordinator α= .84) and also high alpha levels for Partnership (Principal α= .91, Site Coordinator α= .87).

2011 California Standards Test (CST) scaled scores

These variables come in the form of a scaled score, ranging from 150 - 600. The scaled score was the unit of analysis. Scaled scores for both English Language Arts (ELA) and Math were used as outcomes. Scores for ELA range from 327.13 to 357.18, and scores in Math range from 332.29 to 381.48. The mean scaled score for the entire sample in ELA was 343.39 (SD=52.72) and 359.78 (SD=74.59) for Math.

Covariates

Student-level

Students' CST scaled scores from the prior school year were included in the analysis in order to control for prior achievement level. In addition, the grade level of each student from the 2011 school year was obtained from district records. The data set includes students in Grades 3 through 8, as those are the students who would have two years of CST data to provide a control for prior achievement. Each student was dummy-coded as male or female, based on district records from the 2011 school year (Male=1, Female=0). Student records from the districts indicate whether the student is of Hispanic descent or not. The variable was dummy-coded (Hispanic =1, Not Hispanic = 0). Lastly, afterschool program attendance rates for students was added as a covariate, in the form of a continuous variable (ranging from 1 to 180 days).

Site-level

Three school-level covariates are used in the analyses. First, as a potential indication of economic status, the percent of students who receive free/reduced lunch (FRL) at the school was included as a covariate. Eighty-two percent of the entire sample receives free/reduced lunch. Secondly, the percentage of students at each school who are designated English Language Learners (ELL) was used as a covariate. Thirty-three percent of the sample is ELL. Both the FRL and ELL covariates were entered into the models as continuous variables for each school (representing the proportion of each student population).

Lastly, as an indicator of school-level academic achievement, each school was coded as "in" Federal Program Improvement status or not. Records from the California Department of Education indicate whether the school is or is not, and the variable is dummy-coded (In Program Improvement = 1, Not in Program Improvement = 0). Within the entire sample, 74% of schools were in program improvement.

Program Attendance

This study includes afterschool program attendance as a moderator variable. Table 3 displays the mean and

ranges of afterschool program attendance for each district. The average afterschool program attendance for the entire sample is 87 days (SD=66.03). By creating an interaction variable (program attendance x alignment), analyses can explore whether program dosage moderates the association of alignment or misalignment on student academic achievement. An interaction variable will assess whether the association of alignment on student academic achievement is different for a student who attends a highly aligned or misaligned afterschool program at a higher rate. The interaction variable was added to each regression model in this study.

Analysis

Multiple regression analyses were used to assess the relationship between alignment and student academic achievement scores. For greater detail of preliminary analyses that created the alignment variables, please refer to Appendix A. Since the intended audience of this research is geared toward practitioners, unstandardized coefficients were reported because the outcome variables were already standardized in terms of interpreting the results. For example, a significant coefficient of .25 can be interpreted as a .25 change in score on the CST test. It is believed that this is a more interpretable version of the results for the intended audience. The following sections detail the rationale of each approach and how the data for each analysis were prepared. The subsequent section will document the results of the analyses.

High Alignment

Alignment scores were computed for each site (overall and by each survey scale). The alignment predictor variables indicate whether a site is designated as having "high alignment" between principal and afterschool staff reports. With the addition of school-level controls and the program attendance interaction, the regression models for the alignment are as follows:

$$\textit{Student Achievement} = a + b_1 2010\ \textit{Student Achievement} + b_2 \textit{Male} + b_3 \textit{Grade} + b_4 \textit{Hispanic} + b_5 \textit{FRL} + b_6 \textit{ELL} + b_7 \textit{PI} + b_8 \textit{ProgAttn} + b_9 \textit{Alignment} + b_{10} \textit{AcadRes} + b_{11} \textit{Comm} + b_{12} \textit{Partner} + b_{13} \textit{Alignment x ProgAttn}$$

Misalignment

The misalignment predictor variables are a difference score between principals and afterschool staff, and a higher difference score indicates a higher rate of misalignment between the two respondent groups. The regression models for the misalignment analyses are as follows:

$$\textit{Student Achievement} = a + b_1 2010\ \textit{Student Achievement} + b_2 \textit{Male} + b_3 \textit{Grade} + b_4 \textit{Hispanic} + b_5 \textit{FRL} + b_6 \textit{ELL} + b_7 \textit{PI} + b_8 \textit{ProgAttn} + b_9 \textit{Misalignment} + b_{10} \textit{AcadRes} + b_{11} \textit{Comm} + b_{12} \textit{Partner} + b_{13} \textit{Misalignment x ProgAttn}$$

Individual Reports of Alignment

In addition to the high and low alignment predictor variables mentioned earlier, this study also examined the association of alignment at those sites in which only one respondent reported alignment efforts. For example, a site can have an afterschool program site coordinator that reports alignment efforts, yet the principal at the same site does not. This is a potentially important distinction because there may still be an association of alignment on student academic achievement, even if alignment efforts were one-sided as when there are alignment efforts made by one side, but with varied response by the other. Therefore, in addition to the alignment and misalignment analyses, additional regression models will be used to account for these types of sites. Those models are as follows:

$$\textit{Student Achievement} = a + b_1 2010\ \textit{Student Achievement} + b_2 \textit{Male} + b_3 \textit{Grade} + b_4 \textit{Hispanic} + b_5 \textit{FRL} + b_6 \textit{ELL} + b_7 \textit{PI} + b_8 \textit{ProgAttn} + b_9 \textit{PrincipalAlign} + b_{10}\text{ASPAlign} + b_{13}\text{PrincipalAlign x ProgAttn} + b_{13}\text{ASPAlign x ProgAttn}$$

To account for variability within schools, analyses were clustered at the school level. For each analysis, an individual report of alignment variable is entered as a predictor, along with the interaction variables of individual reports and program attendance. The next section reviews the results.

Result

Table 4 displays the bivariate associations between each covariate and the student outcome variables in both ELA and Math. As Table 4 shows, there are significant correlations for a majority of the covariates with both outcome variables. Notably, afterschool program attendance was positively correlated with both outcome variables. In terms of the alignment predictors, the correlations were mixed in significance, depending on the subject. In terms of high alignment, only the partnership scale was correlated with ELA student achievement. For Math achievement however, all scales

(academic resource, communication and partnership), in addition to high alignment were correlated with the outcome variable. For misalignment, every scale and overall score were negatively correlated with both outcome variables of ELA and Math.

In order to examine the associations of alignment and misalignment on student achievement, five regression models were run within each subject area (ELA and Math). The first model within each analysis represents the associations between only the covariates and student academic achievement. The second model within each examines the associations between afterschool program attendance and student academic achievement. The third and fourth models examine the associations between alignment and student academic achievement; with the third model including the overall alignment score, and the fourth model only including the scales of the survey (academic resources, communication and partnership). As mentioned earlier, separate regressions were run in order to account for the linear dependence between the scales and the overall score. The fifth (and last model) in these analyses examines the interaction of program attendance and overall alignment.

High alignment

The first analyses of this study examined the association of high alignment between principals and afterschool staff to student academic achievement outcomes in English Language Arts and Mathematics. Table 5 displays the findings for Alignment and English Language Arts. As with the first study, it was predicted that high alignment sites would be linked to higher scores for students, when compared to sites with lower alignment. As can be seen in Model 2, there was a significant positive association between afterschool program attendance and student academic achievement in ELA (b= 0.016, p< .05). Furthermore, results from the regression analysis (Model 4) indicate a significant positive association of the subscale of Academic Resources on English Language Arts (b= 0.036, p<.01).

Table 6 displays the findings for Alignment and Mathematics. Similar to the results from ELA, Model 2 indicates a positive association between afterschool program attendance and achievement in Math (b=0.064, p< .001). Under Model 3, results indicate a significant positive association for overall High Alignment (b=.019, p<.05). Additionally, results indicate a significant positive association for all three subscales of Academic Resources (b=.008, p<.001), Communication (b=.014, p<.001) and Partnership (b=.032, p<.001) in Model 4.

Misalignment

Analyses examined misalignment as an overall score, and also with a misalignment score for each of the subscales of academic resources, communication and partnership. Table 7 displays the findings for Misalignment and English Language Arts. As with the first study, it was predicted that higher misalignment scores would be associated with a relative decrease in student achievement. In Model 2, positive associations were found between afterschool program attendance and academic achievement in English Language Arts (b= 0.016, p<.05). When examining the overall misalignment score and subscales; however, results from the regression analysis did not indicate any significant differences in achievement scores for English Language Arts.

Results from the regression analysis for Mathematics are displayed in Table 8. As could be expected in Model 2, positive associations were found between afterschool program attendance and academic achievement in Math (b= 0.064, p<.001). Results in Model 3 indicate a significant negative association of overall misalignment (b= -.027, p<.01). Higher misalignment on the subscale of Partnership also resulted in a statistically significant negative effect (b= -0.028, p<.05), as can be seen in model four. Furthermore in Model 5, the interaction of program attendance and misalignment also resulted in a significant negative association with academic achievement (b= -.062, p<.01). This would indicate that students who attend misaligned afterschool programs at higher rates experience a greater decrease in Mathematic achievement when compared with students who have a lower attendance rate in the program.

Individual reports of alignment

It is possible that one respondent's perception of alignment can have an association with student achievement. For example, if the site coordinator believes that they are making strong alignment efforts, it is possible that there is a positive association on student achievement, regardless of the principal report. In order to examine the associations of individual reports of alignment on student achievement, five regression models were run within each subject area of ELA and Math. The first model within each analysis represents the associations between only the covariates and student academic achievement. The second model included afterschool program attendance as a predictor. The third and fourth models examine the associations between principal and site coordinator reports, respectively, of high alignment and student academic achievement.

The fifth and sixth models examine the interaction of each individual report (principal and site coordinator) with program attendance. Results will indicate whether there is an association with student achievement for one respondent's perception of alignment, regardless of the other's responses.

Results from the regression analysis for English Language Arts are displayed in Table 9. Models 4 and 5 indicated a significant positive association for both Principal (b= .048, p<.01) and Afterschool Staff (b =.019, p<.05) reports of alignment. This implies that when either the principal of afterschool staff feels that they are aligned regardless of the other's response, there are significant positive gains on student academic achievement in English Language Arts. There were no significant associations found for interactions with program attendance.

Results from the regression analysis for Mathematics are shown in Table 10 as can be seen, Models 2 and 3 show no significant associations for either Principal or Afterschool Staff perceptions of alignment on student academic achievement. However, there was a significant association found for the interaction of program attendance and Afterschool Staff report of alignment (b= .176, p<.01) in Model 6. This finding implies that when students attend more days in an afterschool program that has a site coordinator who believes they are aligned with the school, there is a significant positive gain on their academic achievement in Mathematics when compared with students with less attendance.

Limitations

The students in this sample all received afterschool programming from one provider, and were compared with other students who also received programming from the same provider.

Therefore, it is unknown whether the same associations would be found across other types of program providers. It is also unknown whether the sites that did not have both respondent groups for the survey are aligned or not. That is important data to collect in future studies. Also, there is a selection bias within the data, as students who were in the afterschool program self-selected into the program, and therefore the sample is not random. A future, more robust study could include multiple comparison groups including other providers, students who did not receive any programming at all, and/or a wait-list comparison group.

Conclusion and Recommendations

The development of a measurable conceptual framework was an important first step in assessing the potential impact of afterschool programs on student achievement, especially at schools in which the alignment efforts are intentional. The analyses within this study are among the first to examine the relationship of alignment efforts and academic achievement. The types of alignment include the categories of academic resources (sharing of materials), communication (frequency of collaboration, and subjects covered), and partnership (feelings of trust, sense of value). The degree to which principals and afterschool staff reported participating collaboratively in these practices indicated the level of alignment or misalignment occurring at their respective site. The primary focus of this research was to examine whether there were any associations between alignment and misalignment with student academic achievement scores. Much research within the afterschool field examines the impact of direct relationships with students; whether it is teacher-to-student, staff-to-student or student-to-student. Since very little research has explored the potential associations between adult-to-adult relationships with student academic achievement, this research can serve as a starting point for future studies on alignment of afterschool programs with the regular school day.

While these adult-to-adult relationships may be indicators of a program's operational quality, few (if any) studies have hypothesized that the intentionality of this relationship has associations with academic outcomes of students in the afterschool program. While the results are not empirically conclusive, this study demonstrates the potential that high alignment between principals and afterschool staff could have a positive association with student academic achievement for students. Given the negative associations of misalignment, alignment practices could transform from recommendations into requirements for funding. As the field builds knowledge around the impact of alignment efforts through more rigorous future studies, there is a potential for substantial policy implications.

While these studies create a framework and foundation for studying the alignment between school and afterschool programs, much more research is needed to garner a true understanding of the most important strategies, concepts and practices that can positively impact student academic achievement. As we saw with the research presented here, there are differential

associations for English Language Arts and Mathematics. This is worthy of further investigation.

While the research evidence indicating the impact of afterschool programs on student academic outcomes is growing, there is still little discussion and evidence about alignment efforts between afterschool staff and principals. This lack of alignment discussion is important to note because state and federally funded afterschool programs have deliverables linked to growth in standardized test scores and positive youth development, yet until now did not have a strategic framework to use that facilitates building a bridge between afterschool program and school efforts to achieve these goals.

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TABLE 1: EXAMPLE ITEMS OF PROPOSED ALIGNMENT MEASURE

Academic Resources	Communication	Sense of Partnership
The afterschool program has access to:	*There is regular discussion between school and afterschool program on the following topics:*	*The school and afterschool program staff believe that:*
Site based curriculum materials for ELA	Curriculum concepts being taught in school	There is a strong partnership between the afterschool program and the school
Site based curriculum materials for MATH	Homework assignments	The afterschool program staff keep school administration informed of important decisions and issues related to program policy
Computer labs for use of technology-based curriculum	The needs or progress of individual students	Teachers are willing to collaborate with the afterschool program staff
Curriculum pacing guides	Issues related to classroom/shared space	Afterschool program staff are responsive to ideas and suggestions from school staff
District benchmark scores	Planning program content	Afterschool staff reach out to teachers to identify the needs of students
School day lesson plans	Enrollment/Registration levels and policies	Afterschool staff transmit important information about children and parents to appropriate school staff in a timely fashion
	Student discipline issues / policies	Curriculum and instruction in the afterschool program reinforce concepts taught during the school day
	Staffing of program	The program is well coordinated with other afterschool activities at the school

TABLE 2: DESCRIPTIVE STATISTICS FOR STUDENT ANALYSIS SAMPLES (N=8,129)

	N	%
Gender		
Male	3,604	44%
Female	4,525	56%
Grade		
Grade 3	1,579	20%
Grade 4	1,593	20%
Grade 5	1,536	19%
Grade 6	1,581	19%
Grade 7	1,072	13%
Grade 8	767	9%
Ethnicity		
African American	310	4%
Asian	209	3%
Caucasian	2,177	27%
Hispanic	4,291	54%
Other	981	12%

TABLE 3: AFTERSCHOOL PROGRAM ATTENDANCE RATES BY DISTRICT

	Afterschool Program Attendance			
	M	*SD*	*Min*	*Max*
Overall	87	66.03	1	180
By District				
District 1	119	64.50	1	180
District 2	101	66.10	1	180
District 3	46	36.61	1	111
District 4	133	51.46	3	177
District 5	114	64.88	1	180
District 6	63	63.56	1	175
District 7	90	64.04	1	175
District 8	113	63.25	1	176
District 9	110	61.09	1	175
District 10	55	56.22	1	179
District 11	116	60.48	1	175

Note: Afterschool program attendance is reported in days..

TABLE 4: BIVARIATE ASSOCIATIONS OF PREDICTOR AND OUTCOME VARIABLES

	2012 English Language Arts Achievement	2012 Mathematics Achievement
Student Level Covariates		
Prior Achievement	0.741**	0.708**
Male	-0.087**	-0.011
Grade	0.041**	-0.25**
Hispanic	-0.078**	-0.003
School Level Covariates		
Free / Reduced Lunch	-0.073**	-0.042**
English Learner	-0.066**	0.086**
Program Improvement	-0.017	0.008
Afterschool Program Attendance		
Continuous (1 to 180 days)	0.077**	0.164**
Alignment Measures		
High Alignment Overall	0.009	0.024*
Academic resources	0.001	0.062**
Communication	0.003	0.021*
Partnership	0.034**	0.067**
Misalignment Measures		
Misalignment Overall	-0.035*	-0.020*
Academic resources	-0.028**	-0.071**
Communication	-0.043**	-0.108**
Partnership	-0.02*	-0.070**

*Correlation is significant at the 0.05 level (2-tailed).

**Correlation is significant at the 0.01 level (2-tailed).

TABLE 5: MULTIPLE REGRESSION RESULTS FOR ALIGNMENT AND STUDENT ACHIEVEMENT IN ENGLISH LANGUAGE ARTS

	(1) Covariate	(2) Attendance	(3) Overall	(4) Subscales	(5) Interaction
Afterschool Program Attendance					
Continuous (1 to 180 days)		0.016* (1.899)	0.015^ (1.782)	0.015^ (1.696)	0.009 (0.890)
High Alignment					
Principal and Staff			1.115 (1.035)		0.225 (1.366)
Alignment: Subscales					
Academic Resources				0.035** (3.319)	
Communication				0.012 (1.022)	
Partnership				0.01 (0.864)	
Interaction					
Alignment x Program Attendance					0.024 (0.715)
Student-Level Covariates					
2011 Prior Achievement	0.736*** (90.468)	0.735*** (90.221)	0.736*** (90.210)	0.736*** (90.127)	0.736*** (90.106)
Male	-0.03*** (3.741)	-0.029*** (3.606)	-0.03*** (3.644)	-0.029*** (3.534)	-0.029*** (3.57)
Grade	0.033** (3.195)	0.037*** (3.482)	0.036** (3.436)	0.036** (3.400)	0.036** (3.394)
Hispanic	-0.028** (3.187)	-0.026** (2.852)	-0.025** (2.811)	-0.026** (2.828)	-0.026** (2.845)
School-Level Covariates					
Free/Reduced Lunch	-0.029** (2.667)	-0.025* (2.233)	-0.026* (2.352)	-0.023^ (1.895)	-0.022^ (1.835)
English Learner	0.05** (3.870)	0.048** (3.697)	0.049** (3.739)	0.033* (2.194)	0.033* (2.174)
Program Improvement	-0.012 (1.352)	-0.011 (1.274)	-0.009 (0.997)	-0.007 (0.799)	-0.007 (0.810)
R^2	0.549	0.549	0.549	0.55	0.55
R^2 Change		0	0	.001**	0

Note: Unstandardized coefficients reported for High Alignment with standard error in parenthesis; Standardized regression coefficients reported for all other variables; T-statistic in parenthesis. ***P<.001 **P<.01, *P<.05, ^P<.10

TABLE 6: MULTIPLE REGRESSION RESULTS FOR ALIGNMENT ON STUDENT ACHIEVEMENT IN MATHEMATICS

	(1) Covariate	(2) Attendance	(3) Overall	(4) Subscales	(5) Interaction
Afterschool Program Attendance					
Continuous (1 to 180 days)		0.064*** (7.393)	0.062*** (7.139)	0.059*** (6.682)	0.168*** (02.504)
High Alignment					
Principal and Staff			3.334* (1.501)		3.706 (1.979)
Alignment: Subscales					
Academic Resources				0.008*** (0.706)	
Communication				0.014*** (1.127)	
Partnership				0.032** (2.733)	
Interaction					
Alignment x Program Attendance					0.111^ (1.639)
Student-Level Covariates					
2011 Prior Achievement	0.683*** (81.354)	0.68*** (81.251)	0.681*** (81.291)	0.68*** (81.175)	0.68*** (81.193)
Male	-0.013 (1.534)	-0.008 (1.015)	-0.009 (1.101)	-0.008 (0.905)	-0.007 (.0890)
Grade	-0.149*** (13.880)	-0.136*** (12.469)	-0.137*** (12.544)	-0.139 (12.653)	-0.139 (12.630)
Hispanic	-0.024** (2.646)	-0.014 (1.477)	-0.013 (1.393)	-0.016^ (1.699)	-0.015 (1.593)
School-Level Covariates					
Free/Reduced Lunch	-0.045*** (4.082)	-0.028** (2.505)	-0.031** (2.767)	-0.019 (1.562)	-0.022^ (1.755)
English Learner	0.023^ (1.767)	0.015 (1.145)	0.016 (1.240)	0.001 (0.073)	0.002 (0.149)
Program Improvement	-0.004 (0.402)	-0.001 (0.105)	0.004 (0.400)	0.006 (0.642)	0.006 (0.529)
R^2	0.524	0.528	0.528	0.529	0.529
R^2 Change		.004***	0	.001**	0

Note: Unstandardized coefficients reported for High Alignment with standard error in parenthesis; Standardized regression coefficients reported for all other variables; T-statistic in parenthesis. ***P<.001 **P<.01, *P<.05, ^P<.10

TABLE 7: MULTIPLE REGRESSION RESULTS FOR MISALIGNMENT ON STUDENT ACHIEVEMENT IN ENGLISH LANGUAGE ARTS

	(1) Covariate	(2) Attendance	(3) Overall	(4) Subscales	(5) Interaction
Afterschool Program Attendance					
Continuous (1 to 180 days)		0.016* (2.071)	0.019* (2.176)	0.018* (2.112)	0 (0.030)
Misalignment: Overall					
Principal and Staff			-0.488 (0.540)		-1.811 (1.090)
Misalignment: Subscales					
Academic Resources				0.013 (1.33)	
Communication				-0.01 (0.882)	
Partnership				-0.004 (0.501)	
Interaction					
Misalignment x Program Attendance					-0.033 (1.786)
Student-Level Covariates					
2011 Prior Achievement	0.736*** (90.391)	0.735*** (90.149)	0.737* (90.032)	0.736* (89.734)	0.736* (89.736)
Male	-0.03*** (3.767)	-0.029*** (3.627)	-0.03* (3.679)	-0.031* (3.745)	-0.03* (3.640)
Grade	0.033** (3.637)	0.037*** (3.951)	0.041*** (3.870)	0.044*** (4.042)	0.043*** (3.982)
Hispanic	-0.028** (3.046)	-0.026** (2.681)	-0.024 (2.636)	-0.022 (2.329)	-0.022 (2.362)
School-Level Covariates					
Free/Reduced Lunch	-0.029** (2.545)	-0.025* (2.064)	-0.021^ (1.870)	-0.018^ (1.533)	-0.019^ (1.597)
English Learner	0.05** (3.865)	0.048** (3.662)	0.047*** (3.582)	0.042** (3.110)	0.042** (3.115)
Program Improvement	-0.012 (0.947)	-0.011 (0.844)	-0.008 (0.996)	-0.009 (1.037)	-0.007 (0.761)
R^2	0.552	0.552	0.552	0.552	0.552
R^2 Change		0	0	0	0

Note: Unstandardized coefficients reported for Overall Misalignment with standard error in parenthesis; Standardized regression coefficients reported for all other variables; T-statistic in parenthesis. ***P<.001, **P<.01, *P<.05, ^P<.10

TABLE 8: MULTIPLE REGRESSION RESULTS FOR MISALIGNMENT ON STUDENT ACHIEVEMENT IN MATHEMATICS

	(1) Covariate	(2) Attendance	(3) Overall	(4) Subscales	(5) Interaction
Afterschool Program Attendance					
Continuous (1 to 180 days)		0.064*** (7.458)	0.062*** (6.974)	0.06*** (6.731)	0.027*** (1.953)
Misalignment: Overall					
Principal and Staff			2.406** (0.784)		-0.482 (1.580)
Misalignment: Subscales					
Academic Resources				0.009 (0.938)	
Communication				-0.011 (1.008)	
Partnership				-0.028** (3.222)	
Interaction					
Misalignment x Program Attendance					-0.062** (3.237)
Student-Level Covariates					
2011 Prior Achievement	0.683*** (80.674)	0.68*** (80.593)	0.68*** (80.699)	0.68*** (80.501)	0.679*** (80.426)
Male	-0.013 (1.478)	-0.008 (0.977)	-0.007 (0.777)	-0.007 (0.778)	-0.005 (0.604)
Grade	-0.149 (13.732)	-0.136 (12.292)	-0.132*** (12.021)	-0.126*** (11.258)	-0.128*** (11.373)
Hispanic	-0.024** (2.592)	-0.014 (1.400)	-0.014 (1.544)	-0.016 (1.647)	-0.016 (1.709)
School-Level Covariates					
Free/Reduced Lunch	-0.045*** (4.078)	-0.028** (2.440)	-0.034** (2.950)	-0.029** (2.427)	-0.03** (2.545)
English Learner	0.023^ (1.804)	0.015 (1.131)	0.018 (1.361)	0.009 (0.649)	0.009 (0.653)
Program Improvement	-0.004 (0.364)	-0.001 (0)	0.004 (0.442)	0.002 (0.254)	0.007 (0.732)
R^2	0.523	0.527	0.527	0.528	0.529
R^2 Change		.004***	.001**	.001**	.001**

Note: Unstandardized coefficients reported for Overall Misalignment with standard error in parenthesis; Standardized regression coefficients reported for all other variables; T-statistic in parenthesis. ***P<.001, **P<.01, *P<.05, ^P<.10

TABLE 9: MULTIPLE REGRESSION RESULTS FOR PRINCIPAL AND AFTERSCHOOL STAFF INDIVIDUAL REPORTS OF ALIGNMENT ON STUDENT ACHIEVEMENT IN ENGLISH LANGUAGE ARTS

	(1) Covariate	(2) Attendance	(3) Overall	(4) Subscales	(5) Interaction	(6) Interaction
Afterschool Program Attendance						
Continuous (1 to 180 days)		0.016* (1.899)	0.015^ (1.785)	0.016^ (1.854)	0.071 (1.117)	0.056 (0.774)
Alignment of Principal						
Principal Perception			0.024** (2.729)		0.048** (3.047)	
Alignment of Afterschool Staff						
Staff Perception				0.019* (1.703)		0.025 (1.521)
Principal Interaction						
Principal Alignment x Program Attendance					0.089 (1.377)	
Afterschool Staff Interaction						
Afterschool Staff Alignment x Program Attendance						0.03 (0.432)
Student-Level Covariates						
2011 Prior Achievement	0.736*** (90.468)	0.735*** (90.221)	0.735*** (90.259)	0.735*** (90.212)	0.735*** (90.190)	0.735*** (90.185)
Male	-0.03*** (3.741)	-0.029*** (3.606)	-0.031*** (3.805)	-0.032*** (3.859)	-0.032*** (3.882)	-0.032*** (3.878)
Grade	0.033** (3.195)	0.037*** (3.482)	0.038*** (3.611)	0.037*** (3.518)	0.037*** (3.506)	0.037*** (3.519)
Hispanic	-0.028** (3.187)	-0.026** (2.852)	-0.024** (2.682)	-0.024** (2.689)	-0.025** (2.764)	-0.025** (2.751)
School-Level Covariates						
Free/Reduced Lunch	-0.029** (2.667)	-0.025* (2.233)	-0.027* (2.399)	-0.023* (2.023)	-0.02^ (1.790)	-0.02^ (1.796)
English Learner	0.05** (3.870)	0.048** (3.697)	0.044*** (3.324)	0.042** (3.238)	0.041** (3.127)	0.041** (3.117)
Program Improvement	-0.012 (1.352)	-0.011 (1.274)	-0.005 (0.568)	-0.005 (0.586)	-0.004 (0.491)	-0.004 (0.447)
R^2	0.549	0.549	0.550	0.550	0.551	0.551
R^2 Change	.001***	0	.001**	0	.001**	0

Note: Standardized regression coefficients reported; T-statistic in parenthesis. ***P<.001 **P<.01, *P<.05, ^P<.10

TABLE 10: MULTIPLE REGRESSION RESULTS FOR PRINCIPAL AND AFTERSCHOOL STAFF INDIVIDUAL REPORTS OF ALIGNMENT ON STUDENT ACHIEVEMENT IN MATHEMATICS

	(1) Covariate	(2) Attendance	(3) Overall	(4) Subscales	(5) Interaction	(6) Interaction
Afterschool Program Attendance						
Continuous (1 to 180 days)		0.064*** (7.393)	0.065*** (7.401)	0.064*** (7.335)	0.123* (1.888)	0.21** (2.824)
Alignment of Principal						
Principal Perception			0.003 (0.354)		0.021 (1.317)	
Alignment of Afterschool Staff						
Staff Perception				0.014 (1.498)		0.016 (0.966)
Principal Interaction						
Principal Alignment x Program Attendance					0.06 (0.915)	
Afterschool Staff Interaction						
Afterschool Staff Alignment x Program Attendance						0.176** (2.439)
Student-Level Covariates						
2011 Prior Achievement	0.683*** (81.354)	0.68*** (81.251)	0.68*** (81.254)	0.68*** (81.233)	0.68*** (81.237)	0.68*** (81.232)
Male	-0.013 (1.534)	-0.008 (1.015)	-0.008 (0.985)	-0.008 (0.932)	-0.008 (0.916)	-0.007 (0.899)
Grade	-0.149*** (13.880)	-0.136*** (12.469)	-0.136*** (12.470)	-0.135*** (12.367)	-0.135*** (12.358)	-0.134*** (12.274)
Hispanic	-0.024** (2.646)	-0.014 (1.477)	-0.014 (1.497)	-0.014 (1.489)	-0.013 (1.433)	-0.013 (1.371)
School-Level Covariates						
Free/Reduced Lunch	-0.045*** (4.082)	-0.028** (2.505)	-0.028** (2.478)	-0.031** (2.724)	-0.033** (2.831)	-0.033** (2.868)
English Learner	0.023^ (1.767)	0.015 (1.145)	0.016 (1.181)	0.017 (1.257)	0.018 (1.321)	0.017 (1.270)
Program Improvement	-0.004 (0.402)	-0.001 (0.105)	-0.002 (0.188)	-0.002 (0.167)	-0.002 (0.228)	0 (0.010)
R^2	0.524	0.528	0.529	0.529	0.529	0.529
R^2 Change	.001***	.004***	.001	0	0	0

Note: Standardized regression coefficients reported; T-statistic in parenthesis. ***P<.001 **P<.01, *P<.05, ^P<.10

EXPANDING COMMON CORE LEARNING OPPORTUNITIES THROUGH PROFESSIONAL LEARNING COMMUNITIES IN AFTERSCHOOL PROGRAM NETWORKS

Practitioner-Based Article

Jazmine L. Frias, Ed.D
Brandon G. Palmer, Ed.D
Dylan M. Capilla, M.A
California State University, Fresno

Abstract

Expanded learning programs can provide additional student learning opportunities to educational stakeholders during out-of-school time. Coordination of efforts including on-going communication between school day and afterschool providers maximizes student impact through the development of intentional experiential learning opportunities beyond the school day. Establishing integrated afterschool networks will strengthen coordination of expanded learning opportunities in afterschool programs as inter-agency personnel effectively collaborate toward a common purpose. Furthermore, the professional learning community model offers expanded learning partners a framework for establishing and sustaining effective afterschool networks aiming to reinforce and extend Common Core State Standard learning. This paper begins by presenting a brief overview of expanded learning through the professional learning community model. Additionally, results and subsequent findings from a recent program evaluation in a large urban elementary district are presented. Finally, a model for establishing professional learning communities within after school networks is presented to educational stakeholders.

Keywords: afterschool programs, alignment, collaboration, Common Core State Standards, communication, coordination, expanded learning programs, Professional Learning Communities

Introduction

Recent implementation of Common Core State Standards has initiated dialogue among educational leaders regarding potential expanded learning opportunities in out-of-school time including afterschool programs. As a result, educational stakeholders are reconsidering the purpose of afterschool programs and in many cases, reevaluating existing afterschool networks in an effort to strengthen coordination and maximize student learning. Correspondingly, experts have conveyed a sense of urgency when advocating for meaningful alliances that provide an intricate link between the school day and afterschool programs.

Complex configurations, often characteristic of afterschool networks (Dryfoos, 1999), tend to segregate afterschool providers from school day networks rather than developing strong inter-agency networks (Afterschool Alliance, 2011). Fortunately, as educators have come to recognize collaboration as a vital component of 21st century student success, the practice of establishing professional learning communities has become prevalent throughout the Common Core State Standards implementation process. Thus, it has become evident developing professional learning communities within after school networks may unlock potential for reinforcing and further expanding Common Core Learning Standards learning (Gonzales, Gunderson, & Wold, 2013; Smith et al., 2014). In an age of 21st century learning demands, working in isolation toward the same end has simply become an obsolete practice (Wilhoit, 2012).

Expanding Learning Through Professional Learning Communities

Expanded learning can be defined as out-of-school time programs which create new opportunities for students by reinforcing and extending school day learning through intentional experiential learning, skill development, and non-academic student support (e.g. social, emotional, behavioral). An exciting new vision of expanded learning in afterschool programs was forged by a network of collaborators and stakeholders within California, closely aligned with Common Core State Standards (CCSS) in 2011. The vision established by the California Department of Education (CDE) recognized the need for expanded learning programs as a valuable resource to student success. One particularly critical initiative of this new vision is to promote coordination between expanded learning programs and stakeholders at the site/school, district, regional, and state levels which requires strong collaborative efforts, as well as on-going commitment to student learning.

Student learning coupled with professional learning is at the crux of Professional Learning Communities (PLCs). Accordingly, establishing PLCs has become a mainstay of CCSS implementation. In Dufour, Dufour, Eaker, and Many's (2006) book, *Learning By Doing*, PLCs are defined as "teams whose members work interdependently to achieve common goals linked to the purpose of learning for all" (p. 3). Fundamental to PLCs is the core belief their members can continuously learn from each other and that teams are stronger than the sum of their parts (Lieberman & Miller, 2011). Although many PLCs are constructed by an assemblage of teachers and administrators, membership should not be limited to formal educators. The elaborated power of PLCs which has begun to transform school cultures and populations (including staff, students, and families) across the nation should encourage educational leaders to consider the potential for "value-added" when informal educators are recognized as an important piece to the CCSS learning puzzle (Hughes-Hassell, Brasfield, & Dupree, 2012; Peterson, 2005). As expanded learning partners seek to maximize learning opportunities in out-of-school time through collaboration, PLCs will become the apparent point of departure for achieving new levels of afterschool program coordination.

Discussion of the Practice

A program evaluation was recently conducted by a consulting team in a large urban elementary school district with a student population of over 20,000 which has operated after school programs in partnership with a local community based organization (CBO) for over a decade. The school district currently operates over 25 afterschool programs serving students in Grades 1-8. The purpose of the program evaluation was to determine existing levels of coordination between partnering agencies in an effort to inform a future afterschool program restructuring scheduled by the sponsoring school district in direct response to new extended learning goals put forth by the CDE.

This program evaluation used randomized purposive cluster sampling when selecting afterschool program site participants. According to Ary, Jacobs, Razavieh, and Sorenson. (2010), purposive sampling involves selection of participants based on the determination by the researcher that a sample is representative of the population. Cluster sampling involves the selection of study subjects in "naturally occurring groups, or

clusters," in this case, school day and afterschool program personnel from individual sites (Ary et al., 2010, p. 154). Ten afterschool program sites were selected out of thirty-four total sites at the discretion of district administration. From the ten selected afterschool program sites, seventy-six school day and afterschool program personnel were invited to participate in this program evaluation. School day personnel consisted of school administrators and teachers designated to support afterschool programs (e.g. principal/designees and academic liaisons). Afterschool program staff consisted of site coordinators and activity leaders.

Fifty-six surveys were completed generating a response rate of 73.6%. Surveys were distributed in person to afterschool program sites and mailed back to the research team upon completion. Twenty-two survey items included a variety of question types including multiple choice, Likert-scale, and open-ended.
Survey participants were asked wide-ranging questions concerning communication patterns and their role in coordination of academic and behavioral support within the afterschool program. Three interviews were conducted with top-level administrators of expanded learning partners. Interview participants were asked a series of questions regarding communication as a requisite to afterschool program coordination and academic and behavioral support provided by the afterschool program.

Quantitative data analysis was performed using SPSS version 21 and qualitative data was analyzed using a combination of open coding, axial coding, and selective coding processes. According to Ary et al. (2010), open coding is an appropriate method for initial coding phases used to disaggregate data, commonly followed by axial coding, a process by which connections are made "between and across categories" (p. 531). Finally, selective coding, is a process by which data is analyzed based on a particular area of focus (Ary et al., 2010). In this case, district priorities including academic and behavioral impact, served as the focus of selective coding processes.

Findings and Discussion

Participants from both the sponsoring school district and CBO provided unique perspectives in facilitating coordination of afterschool programs. Results from survey and interview data yielded compelling findings within the afterschool program in the following areas: purpose, coordination, and communication.

Afterschool Program Purpose

School day and afterschool program survey participants generally agreed on the purpose of the afterschool program--to provide academic support to students. Likewise, a top-level CBO administrator expressed similar feelings stating, "our hope is that our staff is providing a support piece to what is happening during the normal school day" (Hernandez, Palmer, & Capilla, 2013). Academic support results are shown in Figure 1.

FIGURE 1

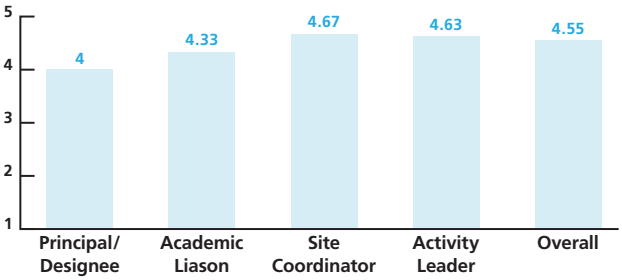

Figure 1. Academic support in afterschool programs by position type. This bar graph depicts reported levels of academic support as a major purpose of the afterschool program. Adapted from "After School Education and Safety Program Evaluation Report 2012-2013," by J. Hernandez, B. Palmer, and D. Capilla, 2013, p. 47.

Afterschool program staff from both the sponsoring school district and CBO also generally agreed behavioral support was a major purpose of the afterschool program with the exception of school administrators who appeared to slightly disagree, as evidenced by survey findings located in Figure 2.

FIGURE 2

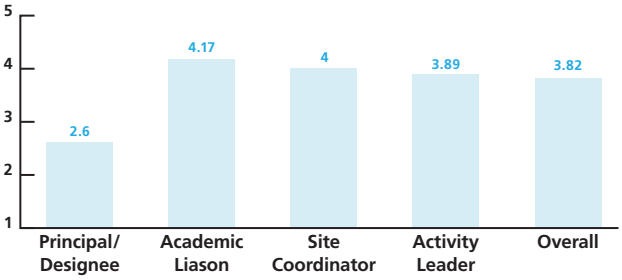

Figure 2. Behavioral support in after school programs by position type. This bar graph depicts reported levels of behavioral support as a major purpose of the afterschool program. Adapted from "After School Education and Safety Program Evaluation Report 2012-2013," by J. Hernandez, B. Palmer, and D. Capilla, 2013, p. 38.

During interviews, a top-level administrator from the sponsoring school district described the desire for afterschool program staff to implement district positive behavior intervention system initiatives across all programs. The administrator described a positive student

behavior system which would identify "[student] positive social, psychological behaviors that would compete [contribute to the reduction of student] infractions or inappropriate behaviors" (Hernandez et al., 2013, p. 77).

Coordination of After School Programming

Coordination between sponsoring school districts and partnering agencies are critical to delivering intentional programming for students participating in afterschool programs (Gonzales et al., 2013; Neuman, 2010). In the present program evaluation, top-level CBO administrators expressed a need for afterschool providers to understand student learning occurring during the school day in order to have a "meaningful impact" in the afterschool program. This sentiment was echoed in the following statement made by the sponsoring school district's top-level administrator: "Ideally, there would be some communication between the school day staff and the afterschool staff relative to here's what the homework is or can you work a little bit more with this student on these issues" (Hernandez et al., 2013, p. 75) Additionally, survey participants from the sponsoring school district and CBO almost unanimously agreed communication was essential for coordination of afterschool programs (Figure 3). Most survey participants also agreed communication helped them understand their role with respect to coordination of after school programs (Figure 4).

FIGURE 3

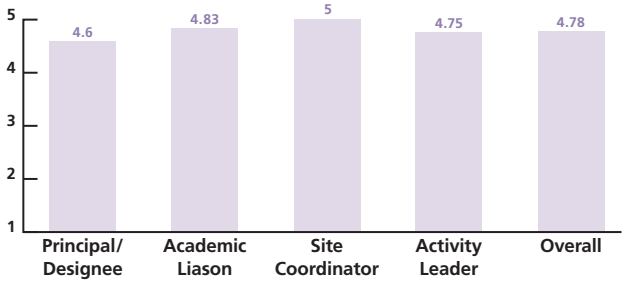

Figure 3. Communication for afterschool program coordination by position type. This bar graph illustrates the importance of communication for afterschool program coordination as reported by participants. Adapted from "After School Education and Safety Program Evaluation Report 2012-2013," by J. Hernandez, B. Palmer, and D. Capilla, 2013, p. 47.

FIGURE 4

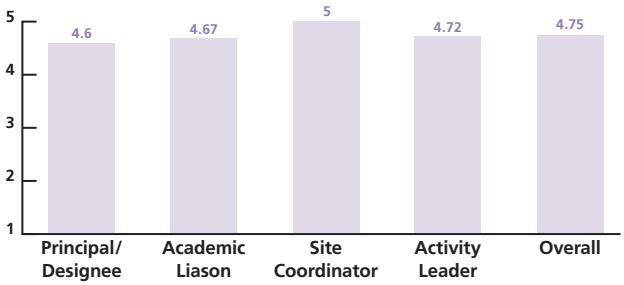

Figure 4. Communication for understanding afterschool program role by position type. This bar graph illustrates the importance of communication for understanding afterschool program roles as reported by participants. Adapted from "After School Education and Safety Program Evaluation Report 2012-2013," by J. Hernandez, B. Palmer, and D. Capilla, 2013, p. 47.

Top-level CBO administrators were cognizant of their organization's strengths to coordinate afterschool programs in addition to strengths of the sponsoring school district. A top-level CBO administrator acknowledged limited pedagogical knowledge and expertise of afterschool program staff and recognized the need for an established line of communication stating "…I know our door should always be open. I think from an agency standpoint, any type of guidance or expertise in that field if they [the sponsoring school district] are willing to share that with us, I think our doors will always be open" (Hernandez et al., 2013, p. 85) CBO administrators believed their organization provided the afterschool partnership with expertise in youth development, mentorship, and engagement through experiential learning. Additionally, top-level CBO administrators expressed willingness and readiness to act as active participants in meeting the needs of the sponsoring school district with respect to coordination of afterschool programs. Top-level administrators from the sponsoring school district expressed similar perceptions of the afterschool partnership as chief provider of academic and pedagogical support to afterschool program staff.

Afterschool Network Communication

Facilitating intentional dialogue with afterschool program providers is imperative for sponsoring school districts, as afterschool program providers are increasingly acknowledged as valuable partners with specialized expertise to support students in purposeful ways (Gonzales et al., 2013). Unfortunately, when lines of communication are erratic or one-way, "insufficient flows of information" may produce confusion, misinformation, and slow circulation among network members (Kenis & Knoke, 2002, p. 281).

Program evaluation results indicated varied frequency levels of communication among afterschool network members, and in some cases appeared to depend on their position within the network. For instance, interviews with top-level administrative personnel from partnering agencies indicated strong agreement regarding communication as a necessary, on-going function among all afterschool network members in order to effectively support participating students. However, survey results revealed differences in reported levels of communication between afterschool network members. Afterschool program providers employed by the CBO reported the highest levels of two-way communication. The entire sample of site coordinators and activity leaders independently reported daily communication. Discrepancies in frequencies existed among all other afterschool network communication exchanges. For example, all school administrators reported daily communication with site coordinators, while 78% of site coordinators reported daily communication with school administrators, and the remaining 22% reported monthly communication. Despite the recognized need among top-level administrators for afterschool program staff members to have clearly delineated communication channels, survey data indicated expectations for communication dematerialized as they deviated from the center of the afterschool network (see Figure 5).

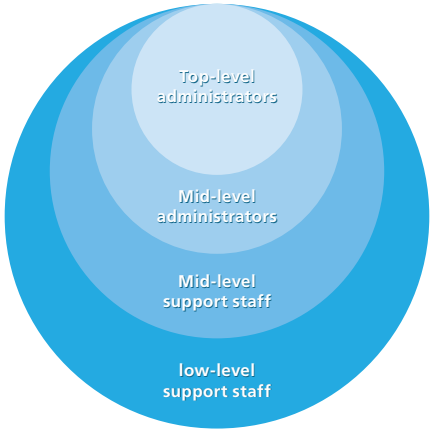

Figure 5. Existing centralized afterschool network. This figure depicts a visual representation of the centralized afterschool network configuration observed by our consulting team throughout the 2012-2013 program evaluation. Adapted from "After school education and safety program evaluation report 2012-2013," by J. Hernandez, B. Palmer, and D. Capilla, 2013, p. 5.

Furthermore, the absence of common language among afterschool network members demonstrated missed collaborative opportunities. For example, during interviews with top-level administrators, both partnering agencies indicated behavioral support was a component of the afterschool program. However, both the sponsoring school district and CBO appeared to implement this practice independently of one another. The sponsoring school district's top-level administrators referred to their behavior support initiative formally as "Positive Behavior Intervention Systems (PBIS)", whereas top-level CBO administrators referred to their methods informally as "positive guidance techniques." Interestingly, aside from using different terms for behavior systems, all top-level administrators described nearly identical methods for providing behavioral support to students. Survey data reflected similar findings. All afterschool network members generally agreed the afterschool program provided a positive behavior support system. However, survey results diverged when items included language associated with district initiatives such as "positive behavior intervention system" or "PBIS". Afterschool program providers employed by the CBO appeared to be uncertain as to whether or not they had a clear understanding of district positive behavior intervention systems or how to implement PBIS. These findings underscore the need for afterschool networks to develop common language in addition to clear, reciprocal lines of communication to ensure effective after school coordination.

Recommendations for Implementation

Challenges often faced by school day and afterschool program staff when bolstering coordination efforts include inter-agency and cross-organization configurations (Wolfe, 2010), frequent afterschool program staff changes (Smith et al., 2014), limited knowledge and experience of afterschool providers, and varying educational philosophies between partnering agencies (Saddler & Staulters, 2008). Notwithstanding well-intentioned efforts, afterschool partnerships fall victim to these distinctive obstacles due to recondite information regarding effective development of PLCs within afterschool networks. Based on the basic tenets of PLCs, current afterschool literature, and findings from our program evaluation, we present the following framework for establishing PLCs within afterschool networks:

Step 1: Explicitly Define Roles and Responsibilities

Contrary to relatively analogous configurations of public school systems, the composition of afterschool networks can fluctuate between schools within a district, as well as from one school district to another. For example, an afterschool network might consist exclusively of district personnel if no partnering agency is contracted.

In the case of the present afterschool program, the afterschool network was comprised of personnel from a school district and partnering CBO. Consequently, school day and afterschool program staff are often uncertain about their role and explicit responsibilities in afterschool programs as evidenced within our program evaluation findings. For instance, although a top-level district administrator assumed primary responsibility by the district to "link people together to expand a sort of network of academic support [for the after school program]," (Hernandez, et al., 2013, p.76) survey data revealed the opposite occurrence. Afterschool providers employed by the CBO more actively sought out opportunities to ensure academic support within the afterschool program when compared to designated school day support personnel (i.e. principal/designees and academic liaisons).

Qureshi (2000) noted even when groups within a network are "geographically distributed" or from different organizations, people can work collaboratively when functions are clearly delineated, enabling those with diverse skills and expertise to "achieve their diverse and specialized ends" (p. 130). In reality, afterschool networks generally consist of large panels of experts whose skills range from high-yield instructional strategies to youth development. However, lack of clarity in specific roles and duties within and outside of afterschool programs can impact the effectiveness of their network. In order to augment coordination between school day and afterschool program staff, top-level administration (from both sponsoring school districts and partnering agencies) must ask questions such as the following: Who will be responsible for providing academic support to the afterschool network? Who will be responsible for providing other types of support to the afterschool network (i.e., social, emotional, behavioral)? Where will the needed resources come from?

Step 2: Develop a Common Purpose and Goals

In their book *Collaborating for Success With the Common Core*, Bailey, Jakicic, and Spiller (2014) emphasized a need for PLCs to create and disseminate a common vision for CCSS expectations in order to ensure all team members maintain a clear understanding of purpose. Likewise, the development of a vision in which opportunities for expanded learning is considered to be of equal value to learning which occurs during the instructional day is essential when establishing effective afterschool programs (Dolge, 2011). PLCs within afterschool networks would be wise to consider what role afterschool programs will play in expanding CCSS learning. For instance, flexible afterschool programming can offer students autonomy in learning experiences which has resulted in increased student motivation and engagement (Shernoff & Vandell, 2007). Skill development, a feature of many afterschool programs, has provided students otherwise labeled as "failing" within traditional school settings an opportunity for success in alternative platforms (Neuman, 2010; Shernoff & Vandell, 2007). Project-based learning environments frequently characteristic of expanded learning afterschool programs can reinforce CCSS learning initiated during the instructional day (Gonzales et al., 2013). In addition, afterschool programs can serve as a bridge between schools and communities when students are engaged in service-oriented projects which in turn, can develop a "sense of commitment to and place within their community" (Neuman, 2010, p. 32). Once a clear purpose for afterschool programs has been established within PLCs, pertinent goals can be developed.

Step 3: Establish Collaborative After school Networks

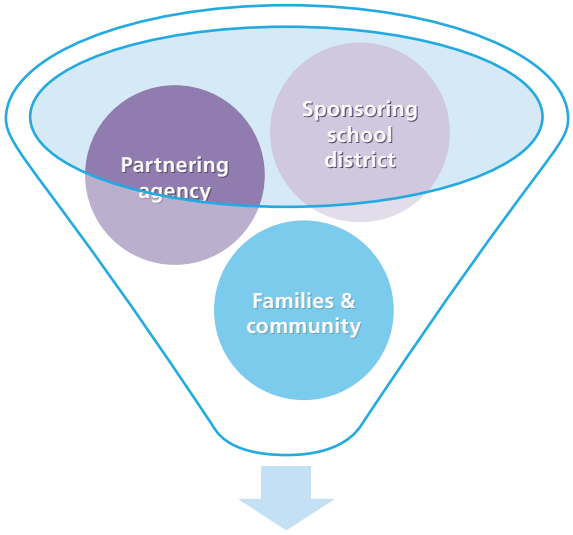

Figure 6. Conceptual model for an integrated afterschool network. This figure depicts a visual representation of a hypothetical afterschool network with established mechanisms for coordination between all members (e.g., PLC framework, reciprocal information exchange flows).

Due to flexibility, establishing network configurations within organizations has become increasingly appealing to leaders when partnering agencies have seemingly asynchronous philosophies or "geographically distributed" team members (Qureshi, 2000, p. 130).

Among other elements, Qureshi (2000) identified cultivating communication "flows" and "building communities of experts" as fundamental to the development of effective networks (p. 129). Smith et al. (2014) suggested initially centralizing afterschool networks in order to establish clear expectations from sponsoring agencies (e.g. school districts) and to ensure "implementation fidelity" (p. 493). Concurrently, Smith et al. (2014) advocated for autonomous decision-making and collaboration within PLCs succeeding initial formation of afterschool networks. Previously, Dolge (2011) discussed the importance of integrated networks when considering afterschool programs stating, "efforts need to be both grass roots and 'grass tops' to ensure afterschool programs are successful" (p. 3).

Undoubtedly, sponsoring school districts should initially take the lead when establishing collaborative afterschool networks, as evidenced within our program evaluation findings. Figure 6 illustrates a conceptual model for establishing an integrated afterschool network. When describing the need for shared knowledge between network members, a top-level CBO administrator stated, "in order for us [community-based partner] to really have a meaningful impact in the afterschool program we have to understand what's going on during the school day" (Hernandez et al. , 2013, p. 80). This comment not only elucidates the need for sponsoring school districts to formulate top-down expectations but also to initiate "information exchange channels" in which two-way communication becomes commonplace (Kenis & Knoke, 2002, p. 281).

Correspondingly, in order for afterschool programs to reap the full benefits of all parties involved within after school networks, it is imperative for information exchange channels to be reciprocated at both ends. Overly centralized networks, especially those with unreciprocated communication channels, risk the possibility of missed partnership opportunities (Kenis & Knoke, 2002). Alternatively, integrated afterschool networks will likely benefit from strong partnerships with diverse areas of expertise as well as build network capacity for effective organizational learning and response (Qureshi, 2000).

Step 4: Building sustainability

Dolge (2011) underscored the importance of "creating a culture that sees expanded day as essential for underserved children" noting inadequacy when relying solely on particular individuals to sustain after school networks (p. 3). Previous work by Dufour et al. (2006) on PLCs has directed collaborative teams to build sustainability through the development of evaluation processes. These processes enable PLCs to assess their effectiveness in achieving established goals, shifting the focus of their efforts when necessary. Additionally, evaluation processes within PLCs propagate a mechanism for accountability, ensuring high-quality afterschool programs for the future (Neuman, 2010; Sherman & Catapano, 2011). Other factors which can impact sustainability of afterschool programs and networks include professional development focused on expanding CCSS learning during out-of-school time (Afterschool Alliance, 2011; Gonzales et al., 2013), collaborative planning time between both school day and afterschool program staff (Gonzales et al., 2013), allocation of resources by administration (Dolge, 2011), and bridging connections between schools, families, and communities (Lauver, 2012). Strategic action when establishing afterschool networks is the key to their lasting success.

Conclusion

School leadership can no longer afford to stand by during what Peterson (2005) described as "the hour when many of the school districts' investments in learning resources and facilities sit idle" (p. 10). Conversely, sponsoring school districts of afterschool programs should take advantage of expanded learning opportunities during out-of-school time. Intentional afterschool programming has the potential to "connect the dots" between CCSS learning before school and experiential learning afterschool, as well as provide additional support for non-academic student needs (Lauver, 2012, p. 43). During our program evaluation, a top-level administrator of the community-based organization offered the following statement regarding their role in a district-sponsored afterschool program:

"We're taking the knowledge that they [students] are learning during the regular school day and applying it to some sort of hands-on relative experience that causes the light bulb to go on. I think for me, that would be one of the main things: taking what they're learning during after school time and giving some practical application to that and making sure that it's like "Oh, aha! That's why we [students] are learning that!" (Hernandez et al., 2013, p. 83)

Developing PLCs within afterschool networks which consist of expanded learning partners has the potential to strengthen existing school systems focused on

student success. Furthermore, when the emphasis for learning during out-of-school time is placed on coordinating rather than aligning efforts between partnering agencies, students are more likely to receive maximal support for 21st century college and career readiness. As noted by Stonehill et al. (2011), "Now more than ever, neither schools nor out-of-school time providers can afford to work independently of one another" (p. 38).

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SCIENCE IN CALIFORNIA'S PUBLIC AFTERSCHOOL PROGRAM: EXPLORING OFFERINGS AND OPPORTUNITIES

Research-Based Article

Ann House, Ph.D
Carlin Llorente, M.A.
Torie Gorges, M.A.
Patrik Lundh, Ph.D
Willow Mata, Ph.D
SRI Education

Abstract

Afterschool programs provide critical access to science learning for many children. Time for science in the school day classroom is often limited, and informal environments are natural settings to engage youth in open-ended, hands-on science explorations. To increase our knowledge of afterschool science learning opportunities, this study examined the types of science learning opportunities in California's public afterschool program and the extent to which they are available to students throughout the state. Drawing on a statewide survey of program directors, we report on the science opportunities available to youth in afterschool settings, and identify three features associated with sites that offer inquiry-based science learning experiences: staffing structure, staff knowledge, and an external partner. We argue that these represent levers for change that policymakers, afterschool providers, and funders can use to increase the quality of science in public afterschool programs.

Keywords: Afterschool, STEM, Inquiry-based science, California

Science in California's Public Afterschool Program: Exploring Offerings and Opportunities

In recent years, afterschool providers, advocates, and researchers have turned their attention to the academic benefits of out-of-school time learning, with particular attention to science in afterschool programs (Chi, Freeman, & Lee, 2008). Many see afterschool programs as an alternative entry point for those students who do not connect with science in the formal school curriculum (Noam & Shah, 2013), and as a learning space unfettered by curriculum requirements that can push science to the margins of a typical elementary school day (Afterschool Alliance, 2013a). In fact, afterschool can be the only educational setting where many children experience science. In California, the vast majority of elementary students have little or no science education in their regular classrooms (Dorph, Shields, Tiffany-Morales, Hartry, & McCaffrey, 2011).

Afterschool programs play an important role in the lives of California students. For hundreds of thousands of children growing up in low-income communities in California, afterschool time is spent in publicly funded afterschool programs that focus on supporting youth development. Research shows that participation in these programs is associated with a range of positive social, emotional, and academic outcomes (Durlak, Weissberg, & Pachan, 2010; Fancsali & Nevárez, 2005; Fredricks & Eccles, 2006; Huang, Gribbons, Kim, Lee, & Baker, 2000; Krishnamurthi, Ballard, & Noam, 2014; Vandell, Reisner, & Pierce, 2007). Yet, the research tradition in the field of afterschool is young (Halpern, 2004), and much remains to be learned about how to build on this tradition of positive youth development and provide deeper academic learning opportunities, particularly in the area of science in comprehensive public afterschool programs.

To increase our knowledge of afterschool science learning opportunities, this study examined the types of science learning opportunities in California's public afterschool program and the extent to which they are available to students throughout the state. Conducted before statewide efforts were made to support and enhance science, technology, engineering, and mathematics (STEM) offerings, the study provided a baseline view of informal science in a publicly funded, comprehensive afterschool program. We surveyed 600 directors of afterschool sites across California to explore the science opportunities available to youth in afterschool settings, and identified the features associated with sites that offer inquiry-based science learning experiences. In this paper we show that the most important factors supporting inquiry-based science learning opportunities include staffing structure, staff knowledge, and an external partner. We argue that these factors represent levers for change that policymakers, afterschool providers, and funders can use to increase the quality of science in afterschool programs.

Literature Review

Recent years have seen growing attention to the issue of quality in science education within and beyond the school day. A consensus has developed around the idea that high quality science teaching and learning involves engaging students in a set of core practices that echo what real-life scientists and engineers do in their daily work, including asking questions, interpreting data, and constructing explanations. These and other practices form the foundation of the Next Generation Science Standards (National Research Council, 2009, 2012; National Science Board, 2002) now being implemented in states across the country, including California. Providing science learning opportunities aligned with these expectations can prove challenging, however, given the competing demands in a regular school day. For instance, only an estimated 10% of students in California schools experience science instruction that engages them in these practices (Dorph et al., 2011). Children who attend public afterschool programs also attend elementary schools where opportunities to learn any science at all are few and far between (Dorph et al., 2011; Pianta, Belsky, Houts, & Morrison, 2007). This is one reason afterschool programs are seen as important places for providing access to quality science learning experiences.

Afterschool programs are also increasingly seen as ideal spaces to raise student interest and achievement in science (Halpern, 2004; Noam & Shah, 2013). Traditionally sites for homework help and youth development, afterschool programs now provide more targeted academic support and are even expected to fill gaps in the elementary-school curriculum, which has been narrowed by increased emphasis on reading and math during the school day. The afterschool setting has been described as a "hotbed of innovation," with the potential to engage youth in science in more open-ended, hands-on ways than the school day allows (Noam & Shah, 2013), in particular when programming is more than just an extension of the regular school day (Honig & McDonald, 2005).

Since they are not accountable for the same achievement demands as school science education, afterschool programs have more freedom to develop student interest in science or STEM (science, technology, engineering and mathematics), which in itself can be an important goal. According to one study, eighth-grade interest in STEM careers provides a better indicator of whether a student will graduate from college with a STEM degree than academic achievement (Tai, Liu, Maltese, & Fan, 2006). There is also evidence that interest in science develops early, before middle school, with origins in activities outside of school (Maltese & Tai, 2010). Afterschool settings can also provide a more equitable STEM learning environment for girls and children from underrepresented groups by integrating collaboration, hands-on experiences, mentoring, and other learning supports not often provided in school-day science (Afterschool Alliance, 2013b; Ferreira, 2001).

The positive potential for rich science learning in afterschool and other informal learning settings is thus well established. There is less data, however, about how much science learning actually takes place in afterschool settings (Noam et al., 2010), in particular in the types of afterschool programs focusing on safety and youth development that most low- and middle-income youth attend. In one study of 792 programs from 36 states, researchers found that programs, on average, provided 54 hours of science over the course of a year, and a majority provided 40 hours or fewer afterschool; in other words, less than an hour per week over a typical 36-week school year (Chi et al., 2008).

Ninety-nine percent of afterschool program providers believe offering some sort of STEM programming is important (Afterschool Alliance, 2011). While many afterschool program providers value STEM and aim to provide science in their programs, they face many constraints, including limited funds and time, and a lack of staff training and interest (Chi et al., 2008). Staffing challenges are particularly important to consider. Staff tend to be unprepared or underprepared to lead science activities, since few come to the work with teaching certifications or college majors in science (Dennehy & Noam, 2005; Freeman, Dorph & Chi, 2009; Nee, Howe, Schmidt, & Cole, 2006). On site, they lack resources, including curriculum materials and science equipment, and have very few opportunities for professional development, which is compounded by the issue of high staff turnover (Freeman et al., 2009; Noam & Shah, 2013). Researchers have also found that afterschool staff often fear science, and see their role as "playing" with students, rather than "teaching" them (Freeman et al., 2009).

This study contributes to our knowledge about science in afterschool by providing much-needed data on opportunities to learn science within the country's largest public afterschool program in California.[1] We explore three specific questions:

- How much science is offered in California's large-scale, publicly funded afterschool program?
- To what extent are inquiry-based science experiences available?
- What are the features of afterschool sites that offer inquiry-based science experiences?

Methods

The work reported here is part of a multiyear study designed to investigate the nature of science offerings in California's *After School Education and Safety* (ASES) program. Through ASES, California invests approximately $550 million each year in afterschool programming for grades K-9. Since 2006, more than 4,000 afterschool sites have been funded and these programs now serve over 400,000 children each year. In addition to providing public funding for the sites, the ASES program gives training, technical assistance, and resources to site staff to meet the operational requirements of sites, which include a strong emphasis on academic support and enrichment activities. We studied the science offerings at these ASES sites across California, and the findings in this paper draw specifically on our survey of ASES program directors.[2]

Afterschool sites within California's ASES system are organized at the community level and run by partnerships between schools and afterschool providers, typically youth and community organizations. Each ASES site serves children from a partner public school in a model designed to support "locally driven" afterschool services—sites are funded by the state but designed and administered locally. Only schools with 50% or more of their students eligible for free or reduced-price lunch can participate in the program, and ASES sites tend to also have more nonwhite students, lower Academic Performance Index (API) scores, and fewer

1. Informal science learning opportunities in other institutional contexts (e.g., in science museums, or other organizations for which informal science education is the primary enterprise) have been described elsewhere (Bevan, Bell, Stevens & Razfar, 2012).
2. In related research, we also conducted case studies of nine afterschool sites to learn about their science offerings in more depth. For more, see Lundh, House, Means & Harris, 2013.

students identified as gifted/talented, compared to California elementary schools as a whole. The vast majority of ASES sites (89%) are affiliated with elementary schools, and our research focuses on ASES sites serving elementary school-aged students.

There are many possible goals that programs may have as they design and provide science offerings for youth, as articulated in the six general strands of science learning in informal science environments (National Research Council, 2009). Our interest in this study was to explore the extent to which youth have opportunities to act as scientists, using inquiry to better understand their worlds, and to learn about science through inquiry-based instruction (Colburn, 2000). Learning settings can vary in the extent or degree to which inquiry experiences are guided by the facilitator (Banchi & Bell, 2008). This study did not set an expectation that students work independently at the highest levels of inquiry, but did explore the opportunities for youth in ASES to engage "in essentially open-ended, student centered, hands-on activities" (Colburn, 2000, p. 42).

The Afterschool Science Survey

We developed a survey that explored the frequency and nature of science activities across sites, as well as the capacity and resources of sites to support their science offerings (*the survey is available at http://afterschoolsciencestudy.sri.com/downloads/ASN-Program-Survey.pdf*). We asked questions on frequency of science offerings, features of typical science activities, types of instructional materials used, supports for science activities, partnerships with science providers, and contextual factors regarding capacity to deliver science instruction, such as staff at the sites and their qualifications. This range of survey topics enabled us to collect rich descriptive data on afterschool science programming.

We administered the Afterschool Science Survey to a random sample of 600 directors of afterschool sites within the ASES system serving elementary-aged students. We took care to ensure the sample was representative of the statewide ASES population, and our analyses showed that the final survey sample was comparable on five key dimensions: proportion of students eligible for free or reduced-price lunch, average API scores, average parental education, proportion of the school's teachers who were credentialed, and the average proportion of students identified as gifted/talented.

The statewide sampling was designed to ensure rural locations were fully represented. Because we did not know how access to resources, staff capacity, and connection to supporting partners might differ between urban and rural settings, which in turn could drive uneven response rates from the two types of settings, we included additional rural sites in the sampling. Weighting was then used to correct back to the balance of rural and urban sites in the statewide ASES population before continuing with the statistical analysis.

We distributed the survey to ASES site coordinators in November and December of the 2010–11 school year. The survey was administered both online and on paper, with the majority of respondents completing the survey online. Those who completed the survey received a $30 gift card. Our survey response rate was 71%, with 415 surveys in the final sample after incomplete surveys had been eliminated.

Analyses included three main steps. First, descriptive statistics were used to construct a broad picture of ASES sites in the sample. Second, a Science Inquiry Index (SII) was created to describe the extent to which the inquiry-based science learning experiences were typical of a site's science offerings. Using a survey question that asked site coordinators to identify how common different kinds of approaches or activities were in their program's typical science offerings, eight items were combined in this index to gauge whether sites offered youth opportunities to participate in extended projects, pose their own questions, choose their own activities, design their own investigations, work in groups or teams, take on leadership opportunities, and connect science to their interests and their daily lives. Using the SII, we placed sites into "high" and "low" categories based on whether the site fell above or below the index median. "High" sites were those that reported that all or nearly all of their science programs offered opportunities for inquiry, and sites that were "low" were those that reported their typical science offerings did not have these features. In the third step, multiple regression analyses were used to identify the program capacity and program support features associated with sites found to be high or low on the SII.

The majority of sites responding to the survey were operated by a school or school district (75%), while the rest were operated by various community-based organizations. Sites ranged in size from small (serving up to 80 students, about a quarter of the sample), to

medium (serving from 81 to 120 students, about half the sample), and large (serving 121 or more students, about a quarter of the sample). We also found that while site coordinators had an average of 8 years experience in their role, sites had high staff turnover, with 30% of line staff reported as new to their site that year. All sites surveyed included services for K-5 students; 62% of sites in the final sample also included services for students up to eighth grade.

Findings and Discussion

We first describe findings about the extent to which science was offered, and the depth of science learning experiences reported by afterschool sites that did offer science. We then describe the features of the sites that offer inquiry-based science experiences, in which we identify three key features: having a designated staff member in charge of science at the site, having staff with knowledge of science activities and youth development principles, and having an external partner that supports science.

Extent of Science Offerings

Consistent with findings reported by Chi, Freeman, and Lee (2008), our study found that 87% of ASES sites had offered science at some point during the 2011–12 school year. These science activities occurred within the context of the many enrichment and recreational activities offered at the sites; homework time, sports, art, and tutoring were all offered, on average, more frequently than science (Table 1).

TABLE 1: ASES SITE OFFERINGS

Site Offerings	Sites offering at least 2x per week
Homework/study time	99%
Sports, outdoor activities	98%
Arts activities	75%
Academically-oriented activities, projects, fields trips in areas other than science	62%
Tutoring	55%
Individual counseling or mentoring	24%
Science-related activities, projects or trips	18%
Community service	6%

Although the majority of sites in our study reported they offered science during the school year, the frequency of science offerings was low on average. Only 18% of sites offered science two times per week or more (Figure 1). Most sites offered science much less often: 30% offered science once a week, and 39% offered science less than once a week on average. Only 4% of the 415 sites included in the final analysis had science offerings on a daily basis.

An important consideration regarding the frequency of afterschool science offerings is the intended vision of science in the afterschool program's overall design. In contrast to the school day, afterschool programs have considerable latitude in deciding what activities to offer, as well as regarding the learning goals of those activities. As a result, science offerings can provide not only traditional academic content as taught during the regular school day, but hands-on inquiry experiences as well. Our research confirmed what other studies have found in examining the range of goals of science afterschool programs (Freeman et al., 2009; National Research Council, 2009). The most frequently cited goals for science offerings (reported in 67% of sites surveyed) was increasing children's awareness of and knowledge about science, in addition to building children's interest in and engagement with science (57%), and improving children's attitudes about science (56%). Among the sites that reported having offered science within the previous year, offerings included a range of science disciplines, such as life sciences, earth/space sciences, other physical sciences, health sciences, engineering/robotics, environmental science, and general science.
While there was some variety in the features of the science offerings, the most common features (occurring in 60%–90% of the sites) included connecting science to students' lives and interests, working in small groups, and providing hands-on activities. These approaches

FIGURE 1

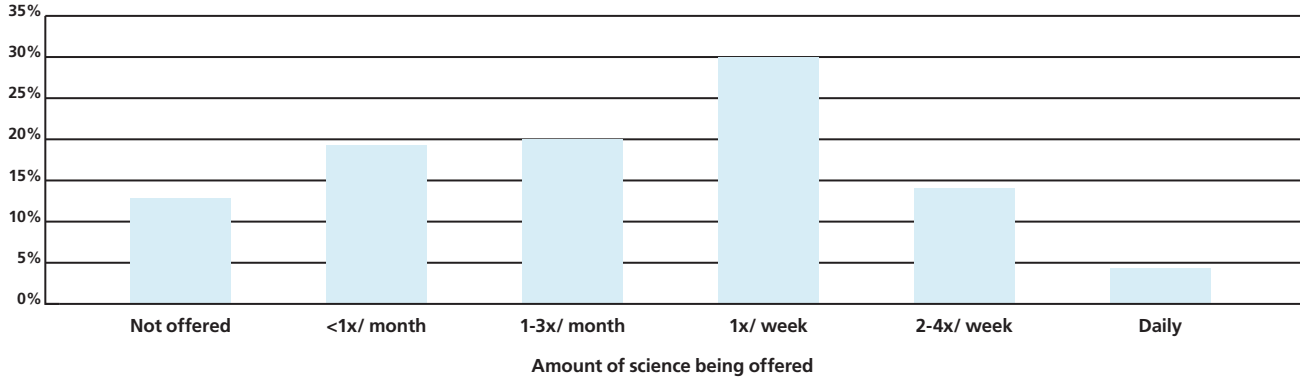

Figure 1. Science offerings in ASES sites. This figure shows the amount of science being offered in ASES sites (13%, not offered; 19%; less than once a month; 20%, 1-3 times per month; 30%, once a week' 2-4 times per week; 4%, daily)

are consistent with afterschool youth development strategies, so it is not surprising that they would also be used during afterschool science activities.

When considering the findings about frequency in combination with the Science Inquiry Index, a pattern showing a narrowing of opportunity for youth to participate in inquiry-based science experiences emerged. Most afterschool sites (87%) offered science at some point during the school year; a little less than half of sites (48%) provided opportunities for youth to participate in science once a week or more; and less than a quarter of these sites (22%) fell above the median on the SII and provided youth regular opportunities for inquiry-based science experiences (Figure 2). In other words, just over a fifth of all sites provided opportunities for youth to have frequent science experiences that focused on aspects of inquiry-based science.

FIGURE 2

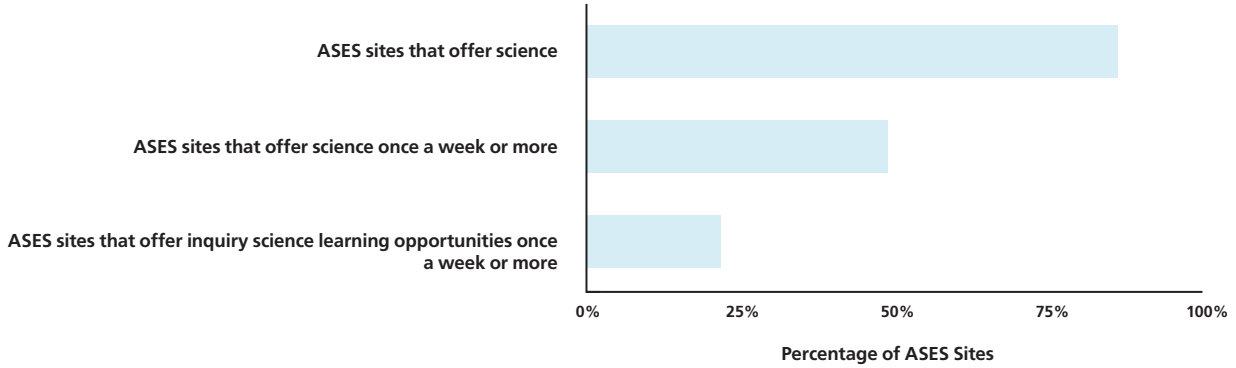

Figure 2. Narrowing Opportunity for Inquiry Science Learning in ASES sites. This figure illustrates how the opportunity for inquiry science learning decreases in ASES sites that offer science (87%, ASES sites that offer science; 48%, ASES sites that offer science once a week or more; 22%, ASES sites that offer inquiry science learning opportunities once a week or more).

Features of Afterschool Sites That Offer Inquiry-based Science Experiences

After looking at the frequency and the depth of science offerings, we investigated what features characterize sites that offer inquiry-based science learning experiences. Understanding that not all programs have the same goals for their science offerings, we were interested in what set apart those sites that do offer science experiences to engage youth in the inquiry process. Using regression analysis, we identified three important features.

First, the regressions revealed that sites high on the SII were more likely to have designated staff in charge of science ($F(1,389) = 11.13$, $R2 = 0.09$, $p < 0.01$). These staff were not necessarily science-content experts or

solely assigned to science, but rather any staff member in charge of organizing, supporting, and perhaps leading science activities as part of their ongoing duties, just as other staff may lead sports or art activities. One interpretation of this might be that intentionally assigning staff to science helps prioritize science by committing staff time and effort. It also ensures that sites have a science champion on site, tracking science activities and plans, resources, partner relationships, and other elements involved in a regularly offered science program.

The second distinguishing feature associated with sites that offer inquiry-based science experiences was staff expertise. Staff at these sites were seen by their site coordinators as having stronger knowledge of science content ($F(1,363) = 15.27$, $R2 = 0.07$, $p < 0.01$) and stronger knowledge of science activity design ($F(1,370) = 20.1$, $R2 = 0.08$, $p < 0.01$) than staff at sites not offering these experiences. Certainly, science knowledge and understanding of leading science in afterschool is a critical resource for offering inquiry-based science learning experiences, and can be seen as consistent with related findings about teacher subject matter content knowledge and pedagogical content knowledge (Schulman, 1986). Staff expertise in general afterschool practices was also a distinguishing feature of sites that offered inquiry-based science experiences. Staff in these sites were seen by their site coordinators as having stronger knowledge of afterschool activities ($F(1,369) = 6.17$, $R2 = 0.03$, $p < 0.05$).

Finally, the third feature we identified as associated with inquiry-based science learning was having an external partner that provided support for the site's science offerings. Results showed that 64% of all sites that offered science had an external science partner, and that having a partner was correlated with having a high SII score ($F(1,390) = 4.03$, $R2 = 0.02$, $p < 0.05$). In addition, these sites with high SII scores were significantly more likely to report that their external partners had a positive influence on their science offerings ($F(1,294) = 6.83$, $R2 = 0.04$, $p < 0.05$). Among all sites, those with partners typically had just one partner (only 5% of those with partners had two or more partners). In addition, partners were local, most often within 50 miles of the site location. Rather than working with, for example, a prominent science center across the state, most sites worked with an organization in a location that allowed for face-to-face visits. Local education agencies and community-based organizations most often served as partners, providing staff training and developing science resources for the site.

Implications

The clear fit between informal science learning and afterschool learning principles constitutes a strong imperative for improving youth's access to frequent and deep science learning experiences in afterschool settings, particularly since most elementary-aged youth in California lack such experiences in school. While our study found some shortcomings in the science offerings in the public sites that serve many of these youth, we also identified levers for change.

Our study showed that, as of 2011, most afterschool sites offered science, but that activities like arts, sports, or tutoring were emphasized much more. While just under half of the sites in the study offered science once a week or more (48%), a little more than half offered science less than weekly or not at all (52%). We also found that a relatively small portion of sites (22%) frequently offered science focused on science inquiry practices. In the majority of sites, science-learning opportunities tended to be focused principally on providing children with safe, fun activities characterized by children following specific instructions in an activity or investigation. We believe there is considerable room for afterschool staff to expand their vision of what science in afterschool can be, and increase the depth of science learning possibilities.

The positive youth development approach of afterschool programs is an important foundation for creating rich science learning experiences for youth. Providing youth with the opportunity to develop interest and engagement in science is an important component of further science learning, as well as one that afterschool sites often have more flexibility to provide than schools (Rahm, Martel-Reny, & Moore, 2005). Offering science on a regular basis can thus add significantly to the science "learning ecosystem" (Krishnamurthi et al., 2014) in which California children grow and learn, and provide opportunities to deepen science learning through inquiry as well as other science-focused experiences that empower youth to explore their worlds.

The fit between science and afterschool is reflected in the alignment between informal science learning and expanded learning principles. The Learning in Afterschool & Summer Project (LIAS) has developed five principles defining quality learning in expanded learning environments that are supported by afterschool and learning science research (Durlak & Weissberg, 2007; Vosniadou, 2001). California's Department of Education Afterschool Division (ASD) incorporated

these principles into its Quality Standards for Expanded Learning (California Department of Education, 2013). These principles also are echoed in the afterschool standards of many other cities and states around the country (Smith, 2013), specifying that learning in expanded learning settings should be active, meaningful, involve collaboration, support mastery, and expand horizons. We believe that afterschool science learning through inquiry is not only well aligned with these principals, but also constitutes a potentially powerful way of implementing these principles in afterschool settings.

Achieving this vision of offering rich science learning opportunities in afterschool that help realize expanded learning principles, is, however, a tall order that will require positive changes among staff, sites, and at the policy and funding levels. Our study has identified promising aspects of science programs that site leaders and policymakers can leverage as they work to improve science offerings. The first of these levers is staffing. While the importance of well-trained and knowledgeable staff has been well documented (Noam et al., 2010), our research also found that simply having a person responsible for science was positively associated with offering more science and, in particular, offering more inquiry-based science learning opportunities. This relationship was true even when this designated science staff person was not a science expert. This aligns with findings from a NASA study showing that youth workers can be strong instructors of science, whether they have science content knowledge or not (Walker, Wahl, & Rivas, 2005).

Second, staff member expertise is another key lever for programs. Hiring staff that have science content knowledge is one way to improve science offerings, though it can be difficult to find such staff and most afterschool staff do not typically have science backgrounds (Freeman et al., 2009; Lundh et al., 2013). These study findings show that another way sites can strengthen their science inquiry offerings is by hiring staff that are expert in designing and leading afterschool activities. This type of expertise was significantly associated with sites offering inquiry activities. Taken together, our research supports the view that it is more important that staff have an understanding of science practices and how these align with afterschool activities than extensive science content knowledge. Having an appreciation of science practices helps staff take a more inquiry-focused approach to science and adopt a problem-solving approach to addressing youth questions and ideas, rather than trying to give answers and instructions.

The third key lever identified through this study was having an outside partner to provide sites with resources that help improve their capacity to meet their science goals. Public afterschool sites with external partners—most of which provided professional development—offered more frequent science, and more inquiry-based science experiences. Importantly, local resources and agencies are just as beneficial as organizations—perhaps with higher profiles—from outside the area.

Conclusion

Hundreds of thousands of children growing up in low-income communities in California attend public afterschool sites after the final school bell. This study adds to the understanding of the extent of science learning opportunities available at sites serving these children, as well as the importance of staffing structure, staff knowledge, and an external partner as factors associated with inquiry-based science learning opportunities. Although afterschool sites value science as part of a well-rounded program, the lack of frequency and lack of opportunity to participate in inquiry-based science learning practices make science in these sites less than ideal. The insights from this study provide policymakers, afterschool providers, and funders with some means to help work toward improving these science offerings so more and more children across the state can experience the learning potential of afterschool science.

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CALL FOR PAPERS

We welcome the submission of papers for our next issue of *The Journal of Expanded Learning Opportunities (JELO)*.

The journal solicits original papers in two categories:

Research-based
Presentation of new research using data that includes an abstract, an introductory paragraph, a brief literature review, methods (quantitative and/or qualitative), results and implications. An example would be an academic or field study.

Practitioner-based
Presentation of an essay or brief focused on a specific promising practice that includes an abstract, introductory paragraph, discussion of the practice and recommendations for implementation, sustainability and scaling. An example would be a review of a program project/activity.

Suggested topics are inspired by the Learning in Afterschool and Summer (LIAS) principles and include:

- Active, project-based learning
- Collaborative learning and programs
- Applied learning activities
- Learning that supports mastery
- Learning that expands horizons
- Instructional strategies that promote student learning

Review submission guidelines and form available at: *www.centralvalleyafterschool.org*

Review Process:
Upon submission of your paper the chief editor or associate editors will send notice of receipt to the contact author. The editor will review the submissions for suitability for the journal and specific category. If not suitable the editor will provide guidance for the author. If suitable, the paper will be sent to the editorial review board for blind review.