Staff Capacity and Professional Development for After-School STEM:

A Summary of Key Research

There are more than six million children in the U.S. who spend an average of eight hours per week in after-school programs.[1] These programs are staffed by about two million employees and volunteers. In order to sustain and institutionalize a challenging and engaging science component in a typical program, the Coalition for Science After School's members offer professional development opportunities to existing after-school staff. By teaching the staff members who work directly with youth about topics such as inquiry-based science, the art of questioning, and connections between youth development and science pedagogy, staff developers ensure that instructors are prepared to lead students in scientific exploration during their after-school programs. This document contains a summary of current understandings about staff development strategies and resources, including a description of the current workforce and efforts to develop that workforce, evidence that youth workers can be effective science instructors, and existing tools for preparing youth workers to lead science activities. This knowledge will help CSAS members leverage existing expertise in science education and youth development to meet the demand for after-school STEM.

Note: There are many different definitions for staff and professional development. This document uses the broad definition provided by the Out-of-School Time Resource Center for *Promising Practices in Out-of-School Time Professional Development:* **"**activities, resources, and supports that help out-of-school time practitioners work with or on behalf of children and youth."[2] Regardless of the approach, the goal of professional development is to improve performance, so that each individual is as effective as possible in carrying out their roles and tasks in support of the common mission.

The State of the Current After-School Workforce

In 2006, the Next Generation Youth Work Coalition (NGYWC), through work conducted by the Forum for Youth Investment, published the most complete information available on the existing "frontline youth workforce." The authors use this term to describe those who work directly with youth for more than 50% of their job "because it communicates the purpose of the profession more clearly than other terms like youth development, out-of-school time, school-age care, youth services, or after-school." The NGYWC report provides the following key findings based on information from two studies that gathered information directly from over 5,000 youth workers[3]:

- The workforce is diverse, including a variety of ages, backgrounds, and prior education and work experience levels. There are two main points of entry – many youth workers enter the field young and often leave for other careers, while others enter in their 40s and 50s from other fields.
- Job satisfaction is high, but so is mobility. They stay primarily because they are committed to working with youth, but they leave due to a variety of factors, especially low wages and limited opportunities for advancement. Mobility is often to another organization, and not necessarily out of youth work.
- Employees may be part-time by choice (40%). However, 60% would be interested in full time work if available.

- Advancement and formally recognized training opportunities are rare, but desired. Youth workers are more likely to seek training as incentives increase. Formal recognition, stipends, wage increases, and advancement opportunities are rarely attached to training.
- Youth work needs stronger support systems and networks as well as greater legitimacy as a career choice.

The youth workers of two of the largest providers of after-school programs – 21st Century Community Learning Centers (21st CCLC) and 4-H -- appear to differ significantly from the above findings. Over the past decade, funding through the U.S. Department of Education's 21st CCLC has grown to more than $1 billion per year (expanding both the number of after-school programs and therefore the number of staff). These centers are more likely than other after-school programs to have an academic focus and to employ classroom teachers with overtime pay.[4] Meanwhile, 4-H has about 5000 core staff who are tied to the land grant university structure. As a result, 4-H programs are more likely than most other youth organizations to have dedicated youth development staff who hold advanced degrees.[5] However, most direct contact with youth through 4-H is done by the 540,000 volunteers.

Existing Efforts to Professionalize the After-school Workforce

As the youth workforce has grown in recent years, so have efforts to professionalize it. These efforts serve both to increase the capacity of the staff to support program participants and to make youth work a more attractive and sustainable career option. Efforts to increase professionalism while in-service include learning communities and networking opportunities. Colleges and universities are starting to develop after-school credentials, offer courses that lead to a professional certificate, and create full degree programs dedicated to the after-school environment and population.[6]

The NGYWC connects many of the organizations working to improve the after-school workforce. NGYWC advocates "a flexible and fair career pathways system" that requires, recognizes, and rewards competence with expectations that change with levels of responsibility. An acceptable career pathways system reflects the perspectives of all stakeholders, leverages public and private funding sources, and reaches all youth workers, regardless of level or experience.[7]

An effective professional development system can improve program quality, increase opportunities for youth workers to make their job a career or to learn skills that can be applied in other fields, and enhance the overall field by creating networks for sharing knowledge. The system includes: standards and competencies; learning resources; learning delivery system; compensation and career ladders; and, research and evaluation[8]. Each piece of the professional development system contributes to effective transfer of skills to workers who directly support youth. This further depends on training for supervisors, a valuable but under-provided part of professional development. Managers and organizations should "support youth workers in ways other than just by acting as a role model." The system needs a wide range of support from local, cross-city and –state, and national providers in supporting both front-line staff and supervisors.[9]

Evidence that Youth Workers can be effective STEM Instructors

Although the body of evidence is incomplete, there is a growing literature from researchers who have noted "the potential for afterschool leaders to function as facilitators of inquiry without having an extensive science background or science teaching experience."[11] The potential for fostering science in after-school programs is noted in the critical report, *NASA and Afterschool Programs*, as with one

example pair of teenaged instructors who "need strategies for connecting learner thinking to established scientific knowledge. Yet they have successfully led their participants through the rest of the essential features of science inquiry. … While they have little experience as science teachers and little content knowledge, they have had extensive youth development and literacy training."[10] This type of training is much more likely than science content to be offered using the core funding for after-school programming. Thus, it benefits the cause of science learning if targeted inquiry staff development efforts build on this existing foundation of youth development.

The examples cited by the NASA report are supported by a base of evidence about how children learn science. Children as young as six years old demonstrate "the beginnings of scientific expertise" by talking through the inquiry process.[11] This is most effective when the children's voices are more important in the conversation than the adult's.[12] Staff with youth development training may have an advantage in guiding these conversations without overwhelming the children's ideas. Adults with strong formal science backgrounds may be more likely to override a meandering student conversation. While such conversations may contain misconceptions, the opportunity to explore their own ideas and follow through the inquiry process is a valuable one that after-school staff can support.

There is further evidence that after-school programs are good settings for teaching communication, problem solving, and teamwork skills. "Students only acquire expert thinking, complex communication, and other new basic skills by practicing them. Afterschool programs can provide students opportunities to practice these skills both individually and in teams and to apply them to areas of possible interest."[13] Murnane and Levy's "new basic skills" are aligned with science and technology activities that promote inquiry and innovation. Staff development for youth workers is the missing link to promoting STEM topics as "areas of possible interest" in which these skills are practiced.[13]

Tools for Developing Youth Workers into STEM Instructors

In 2003, the 21st CCLC program funded the National Partnership for Quality Afterschool Learning. This partnership has assembled a body of research and toolkits that provides user-friendly guides with best practices for after-school programs in several disciplines, including science, technology, and mathematics. Web-based toolkits were created to help prepare staff based on these best practices. The toolkits include descriptive summaries, sample activities, and video vignettes that exemplify each practice. In addition, the site includes curriculum guides for each topic area. The toolkit website, hosted by SEDL (formerly the Southwest Educational Development Lab), receives approximately 8000 uses per month. SEDL has developed tools that encourage after-school program leaders to use the toolkits with their staff in as little as 15 minute segments.[14]

In addition, evaluation of the Education Development Center's (EDC) Design-It program, which supported partnerships between science centers and after-school programs to deliver engineering curriculum, found that staff from each type of institution reported the development of a closer relationship with the other.[15] EDC has now applied that experience through the National Partnership for After-School Science, developing a toolkit for staff development relationships between science centers and after-school programs.

These tools, and others like them, set examples that others can follow in building inquiry-based staff development for youth workers.

Citations

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