

## **The Role of Out-of-School Programming in Advancing STEM Education in Indiana**

Indiana is recognized as a national leader in out-of-school time (OST) STEM education. Dr. Alyssa Briggs, Director of the STEM Learning Ecosystems Community of Practice, recently summarized well the successes achieved during the past years by Indiana STEM advocates, including those in afterschool: "The Indiana STEM Ecosystem Initiative, co-led by the Indiana Afterschool Network, has been a national leader and model for its work in the afterschool space and STEM education in general. As the leader of the STEM Learning Ecosystem Community of Practice, I am frequently directing others to look at the work of the Indiana STEM Ecosystem Initiative."

The Indiana STEM Six-Year Strategic Plan, developed by the Indiana Department of Education (IDOE) with the guidance of the Indiana STEM Advisory Council, clearly recognizes and encourages the important role that OST educators play in advancing STEM learning for Indiana students. A key component of the Plan is the concept of "Innovative STEM Stakeholder Collaboration," which requires the partnership of external (outside of government) stakeholders, including afterschool programs, "to develop innovative solutions to solve our STEM deficit problem and to accelerate and scale evidence-based impact." A long-term goal set by the Plan is to "support the continuum of STEM education in the classroom to out-of-school and afterschool opportunities and activities for students and teachers."

The Indiana OST community, led by the Indiana Afterschool Network (IAN), has worked closely with the IDOE for more than eight years to extend the STEM learning day beyond the limits of the formal classroom. Students spend only 20% of their waking hours in the classroom. Indiana out-of-school leaders and program providers have recognized for years the opportunities offered during those non-school hours to expand students' exposure to STEM learning, as well as to other areas necessary for future advancement, such as college and career readiness and the development of 21<sup>st</sup> century skills.

Since 2010 the Indiana OST community has excelled in providing high quality STEM education to more than 50,000 young people every year, particularly those in grades 1-6 where in-school STEM learning opportunities are often limited by resources and the time required by mandated assessments. Recognizing the advantages offered by collaboration of formal and informal educators, the IDOE and Indiana OST programs are intent on developing strategies to offer more STEM content and experience to students.

The Indiana OST community is ready to expand its STEM programming and to work collaboratively with their school partners. IAN is already leading a national conversation on the need for greater integration of in-school and out-of-school STEM programming.

### **How Indiana has been a national leader in out-of-school STEM education**

Led by the leadership of IAN and the I-STEM Resource Network (Purdue University), in 2015 Indiana joined the inaugural cohort of the national STEM Learning Ecosystem Initiative. A key outcome of this initiative has been the growth and influence of the Indiana STEM Education Taskforce, a group started by the I-STEM Resource Network in 2014 and, since 2015, co-led by that group and IAN. This large (450+) and diverse state-wide group shares a common objective of ensuring that all Indiana students have access to high quality STEM education. It is comprised of representatives from business, K-12 education, higher education, afterschool programs, museums, government, and community organizations. From its start, the group's primary focus has been on the development and implementation of a state STEM education strategy, and the group, with its expansive connections to

interested constituents throughout the state, is expecting to play an influential role in the support of the Indiana STEM Six-Year Strategic Plan.

As an original member of the national STEM Learning Ecosystem Initiative, the partnership of IAN and the I-STEM Resource Network has gained national attention as a state-wide collaborative effort to advance STEM education. Bob Abrams, IAN STEM Education Coordinator, and Paul Ainslie, the former Managing Director of the I-STEM Resource Network, along with Reginald McGregor of Rolls-Royce Corporation, were invited to contribute to a compendium on STEM education entitled STEM Ready America. Their chapter, "Preparing the Indiana STEM Workforce – How Afterschool and its Partners are Contributing," was included in the book which was released at the National Press Club in Washington D.C. on March 1, 2017.

### **How the Indiana Afterschool Network is leading the effort toward greater integration of in-school/out-of-school STEM education**

Formal education and out-of-school programming have generally operated in silos, even in the common situation in which they share facilities. However, IAN and a growing number of formal and informal educators recognize the potential benefits that can be realized if STEM learning is extended beyond the 'regular' school day into the out-of-school space. Not only does this expand students' exposure to content, but it offers the possibility for them to learn in different ways which can help to close achievement gaps. Working collaboratively, both out-of-school and in-school educators can learn from each other and leverage one another's strengths.

Through its research and advocacy for greater collaboration of formal and informal STEM programming, IAN is considered a national leader in this cause. Benefiting from the nation-wide connections offered by its participation in the national STEM Learning Ecosystem Initiative, early in 2018 IAN leadership released what is currently considered the definitive paper on the subject. It defines the obstacles to in-school/OST partnerships and provides solutions that have been demonstrated by schools and OST programs around the country, including here in Indiana. From this work, Bob Abrams of IAN is a major contributor to a national working group of the national STEM Learning Ecosystem Initiative focusing on how to advance greater in-school/OST collaboration.

IAN has and continues to support and highlight successful examples of in-school/OST STEM collaboration in Indiana, such as a very innovative program in the Bartholomew Consolidated School Corporation. IAN also contributed to the design of and continues to support the Indiana Department of Education STEM School Certification program, which requires a school to partner with an OST program that provides high quality STEM education.

IAN takes every opportunity to spread the word on the opportunities offered by in-school and out-of-school partnering for improved STEM learning. IAN has led workshops on STEM learning at national STEM Learning Ecosystem convenings in Orange County, California in 2016 and in Washington D.C. in Spring 2018. In the coming months IAN will lead workshops on in-school/OST collaboration at the October 21<sup>st</sup> Century Community Learning Center Multi-State Conference in Louisville as well as at the November STEM Learning Ecosystem Initiative meeting in Orange County, California.

## **How quality STEM education has been a major focus in the Indiana out-of-school community**

To provide statewide OST programs with guidance on what constitutes quality and effective STEM learning, in 2012 IAN created a research-based, comprehensive set of standards which are closely aligned with the Indiana Department of Education academic standards. These Indiana STEM standards for afterschool are now recognized and used nationwide to define quality STEM programming in the out-of-school space.

IAN understands the critical need for quality professional development for those in the out-of-school field who work with students. This is particularly necessary in the STEM subjects which so often do not get adequate coverage in the classroom. Therefore, IAN is the major provider of STEM training to Indiana OST educators, most notably at its Summit of Out of School Learning attended annually by more than 700 people involved in OST education. For example, during the April 2018 Summit, 26 workshops were offered that focused on STEM and related career development topics. That was 34% of all workshops presented.

As compared to the formal school setting, OST programs generally offer the advantage of a more flexible learning environment. Recognizing the opportunity as well of the challenges of enabling OST educators to provide hands-on, interactive educational activities, IAN has served as the primary facilitator of high-quality STEM curriculum to Indiana OST sites. IAN maintains a list of vetted and proven STEM curriculum for OST which it regularly recommends to programs. Through its various partnerships, IAN has made available and managed high-quality STEM programs for OST providers throughout the state, such as the NASA Ignite project (2013-2015) and the 2016 NASA STEM 21<sup>st</sup> Century Community Learning Centers Project.

Realizing that effective evaluation is necessary to ensure the quality of OST STEM learning, Indiana afterschool programs have been a major contributor to the development and utilization of the Dimensions of Success (DoS), an assessment designed by the PEAR Institute at Harvard University. There are currently more than 50 people in Indiana who have been certified by PEAR to perform DoS observations – amongst the highest number in the nation – and several Indiana OST programs have embedded the DoS quality criteria into the planning and facilitation of their STEM activities.

Through the facilitation of IAN, more than 30 Indiana afterschool and summer programs around the state have participated since 2014 in four Harvard PEAR Institute research projects. Thus, Indiana OST has been a consistent and major contributor to the development of DoS and related tools that have proven invaluable in assessing and ensuring the quality of informal STEM learning nationally.

Many Indiana afterschool programs also use the Indiana Quality Program Self-Assessment (IN-QPSA), an on-line tool developed by IAN, to evaluate how their STEM programming aligns with the STEM afterschool standards.

*During the past eight years, Indiana afterschool programs have played an integral role in the expansion of quality STEM learning available to students. With that purpose, the Indiana afterschool community has partnered for years with the growing number of educators, business representatives, community leaders, and policy makers who believe that our state must have a well-defined STEM education plan, and that plan must take advantage of extending the STEM learning day beyond the classroom.*