

# STEM READY AMERICA

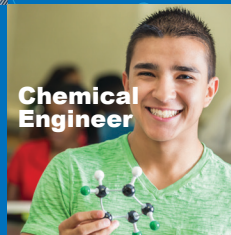
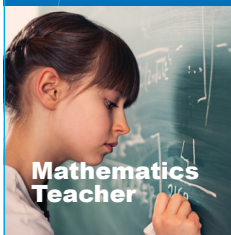
Inspiring and Preparing  
Students for Success  
With Afterschool and  
Summer Learning

This collection of articles is excerpted from a new resource, *STEM Ready America: Inspiring and Preparing Students for Success with Afterschool and Summer Learning*. In this volume, Executive Editor Ron Ottinger and Contributing Editors Cary Sneider and Ian Hickox have collected expert perspectives on the state of the field of STEM learning—especially in afterschool and summer learning opportunities.

Collectively, these writings from more than 40 thought leaders highlight how young people are developing STEM knowledge and skills that will prepare them to be successful in school today and the workforce tomorrow.

The articles provide persuasive evidence and real-world examples to inform effective partnerships, policies, and actions to bring quality STEM learning to children and youth across the nation. This volume is focused in three key sections:

- ▶ **The Evidence for STEM**
- ▶ **Partnerships for STEM Learning**
- ▶ **Ensuring Access to Quality STEM Learning**



Developed by STEM Next with support from the Charles Stewart Mott Foundation, *STEM Ready America* builds on the award-winning 2013 publication *Expanding Minds and Opportunities: Leveraging the Power of Afterschool and Summer Learning for Student Success* edited by Terry K. Peterson, Ph.D., which made the definitive case for the power and effectiveness of afterschool programs and summer learning.

For more information about STEM Ready America and to download articles visit: [www.stemreadyamerica.org](http://www.stemreadyamerica.org).



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# Engaging Creative Minds: How Summer STEAM Deepens Engagement, Heightens Interest, and Expands Opportunity

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STEM Next | Charles Stewart Mott Foundation



There is little doubt that access to STEM learning opportunities is essential for young people to develop the knowledge and the skills they need to thrive in the 21st-century workforce. As the other articles in this compendium so clearly demonstrate, afterschool and summer programming together represent a powerful vector for cultivating STEM skills and interest, and for reaching young people who might not otherwise have the opportunity to engage meaningfully with the STEM fields. Increasingly, educators are recognizing the promise of afterschool and summer education experiences that not only incorporate deep engagement with STEM subjects and concepts but also integrate the arts to create what is commonly referred to as STEAM. STEAM is premised on the imperative to teach the whole child by making learning more interdisciplinary, meaningful, and related to the students' lived experience.

This article describes how the Engaging Creative Minds Summer STEAM Institute, an award-winning summer camp in South Carolina, leverages community resources and builds the capacity of the education community—through a focus on teacher professional development—to provide STEAM programming designed to mitigate summer learning loss, accelerate the development of key workforce skills, and increase youth engagement and interest in STEM and the arts.

STEAM education is a workforce need. Adding the arts to STEM is essential for advanced manufacturers like Boeing. We require a pipeline of well-rounded students that meets the demands of a global company in the 21st Century, and that includes skills like problem-solving, creativity, collaboration and innovation.

—Dan Mooney,  
Vice President, Engineering  
Design Center, Boeing  
South Carolina

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## Out-of-School Time STEAM and Educational Equity

In the Berkeley-Charleston-Dorchester tri-county area of South Carolina—where Engaging Creative Minds is based—student outcomes data indicate that the education system is doing an inadequate job of preparing young people for college and career success. According to the Tri-County Cradle to Career Collaborative (2016), by the time they graduate high school, two in three students are unprepared for college and one in three is not ready for the workforce. There are also clear racial and socioeconomic disparities among educational outcomes. For every 10 black children in public schools in the tri-county area, only one is proficient in eighth grade math compared to 5 in 10 white students; 94 percent of black students in the area are not ready for college math (Tri-County, 2016).

To address these problems with the area education system, the Tri-County Cradle to Career Collaborative calls for the development of a “cohesive system of support for our under-resourced children from infancy through workforce and career readiness” that includes expanded access to out-of-school-time (OST) learning opportunities. STEAM education in OST settings has the potential to expand access to learning opportunities that young people in traditionally underserved communities might not otherwise have the chance to engage with in school or at home. Moreover, summer programs have the added benefit of helping to stave off summer learning loss, which the National Summer Learning Association reports can leave low-income students as many as two-and-a-half to three-years behind their peers by fifth grade.

In OST STEAM, the complementary characteristics of learning in the arts and STEM fields combine to enrich the learning experience for young people. In fact, the artistic/creative process is, in important ways, an analog to the scientific process. These skills amplify the development of vital workforce skills, including creativity, problem solving, collaboration, and innovation, as well as key affective dimensions of learning, such as interest in and passion for the arts and STEM.

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## Creativity and the Case for STEAM as a Workforce Solution

Employers across sectors have long recognized that the skills young people learn in the arts programs are highly valuable assets for assembling a strong contemporary workforce. In fact, the creativity that the arts help to develop ranks among the five applied skills that business leaders seek when hiring; in fact, the Conference Board’s report *Ready to Innovate* (Lichtenberg, Woock, & Wright, 2008), indicates that 72 percent of business leaders surveyed indicated that creativity is of high importance when hiring. The report concludes that the arts clearly “provide skills sought by employers of the third millennium” and that “employers are placing greater strategic value on innovation and increasing the importance of employing creative workers.”

A report from Americans for the Arts (2016) showed that students with an education rich in the arts have higher GPAs and standardized test scores, and lower drop-out rates. Students with four years of arts or music in high school average 100 points higher on the verbal and math portions of their SATs than students with just one-half year of arts or music.

This emphasis on creative thinking and innovation is a major element of what makes the combination of STEM and the arts so powerful from a workforce development perspective. Because it is an integrated instructional approach, STEAM allows for sustained engagement with STEM concepts, using the arts both as a vehicle and a subject unto itself. In this way, STEAM says we can be better scientists and engineers by learning how to think artistically and creatively. In the same mutually reinforcing way, the engagement with STEM concepts and skills informs how creative pursuits can benefit from STEM, especially in an increasingly interdisciplinary and digital world (Feldman, 2015).

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## The Summer STEAM Approach

The Engaging Creative Minds Summer STEAM Institute is a set of six-week summer camps that serve young people (Grades 3–8) from two regions in South Carolina: Charleston County, where the second largest city in South Carolina is located, and Clarendon County, a rural county of just over 34,000 residents. In Charleston, the camps are held on the campuses of the College of Charleston and The Citadel. The Summer STEAM Institute was recognized by the National Summer Learning Association as one of four outstanding summer programs to receive their 2016 New York Life Excellence in Summer Learning Award. In 2017, Engaging Creative Minds will add a third site in rural Berkeley County, South Carolina.

Enrollment in Summer STEAM is managed to ensure a diverse population of 100 learners and to extend valuable learning opportunities to students who might not otherwise have access to summer learning, STEM, or arts opportunities. In each weekly cohort, 30 students receive scholarships to fund their participation. These are young people identified by their school district as underserved, underperforming students who are historically likely finish the school year in or around the 13th percentile only to return in the fall in the 9th percentile as a result of summer learning loss.

## The Summer STEAM Institute Impact

Year	Number of Sites	Total Number of Campers
2014	1	80
2015	2	500
2016	3	950
2017*	3	1,050

\*Projected

Funding for the Summer STEAM Institute comes from multiple partners and is differentiated by site. The College of Charleston and The Citadel sites are funded through a combination of grants—for student scholarships and artist stipends—and support from colleges and universities, which pay for teacher salaries. The local school district provides use of schools and access to the summer feeding program. Everything else is funded through an annual fundraiser, the Charleston Marathon. Additionally, community organizations—including Boeing DreamLearners program, Historic Charleston Foundation, The Gibbes Museum of Art, and The Halsey Gallery at the College of Charleston—provide free field trip opportunities to Summer STEAM Institute campers. By contrast, the Clarendon County Summer STEAM Institute is funded entirely through a grant from the South Carolina Arts Commission.

Since it was first piloted in 2014, the Summer STEAM Institute initiative has grown rapidly, thanks to a model that is conducive to being scaled because the Summer STEAM Institute approach is truly community-based. Engaging Creative Minds hires site staff from within that community, provides STEAM training for artists and teachers, and helps them set up everything from marketing to grant

writing to processes for identifying local funding sources. The goal is that by their third year each site is self-sustaining and able to operate with minimal support from Engaging Creative Minds. This approach enables Engaging Creative Minds to scale the Summer STEAM Institute without having to scale up, as an organization, at the same pace.

### Integrated Curriculum and a Focus on Engagement

The Summer STEAM Institute is intentionally designed to stimulate young people’s creativity and open new pathways for learning by teaching standards-based STEM concepts through, and with, the arts. For example, a dance artist may teach campers about ballet while also teaching them physics concepts—such as friction, push, pull, gravity, weight, and mass—that they can experience and experiment with through dance.

Students were challenged in ways that increased their social learning skills by working collaboratively to solve problems, trusting each other, and working outside their comfort zone. The relationships that young people develop with caring, interested adults are key to their learning experience. These relationships help students be more accepting of the guidance knowledgeable adults and peers provide; these relationships also help many students cultivate their leadership skills under the guidance of adult mentors.

According to an external report of the 2014 pilot for the Summer STEAM Institute in Charleston County, 63 percent of campers had no summer learning loss when comparing their Spring 2014 MAP (Measures of Academic Progress) scores to their Fall 2014 MAP scores (Charleston County School District, personal communication, 2014). Moreover, surveys of students from Charleston and Clarendon County who attended each of the six weeks the Summer STEAM Institute were held found that 87 percent thought the institute activities “helped them learn” and 85 percent indicated that the STEAM activities were “fun and interesting.”

## Professional Development

One of the central features of the Summer Institute model is its emphasis on strengthening the capabilities of the regional education system and communities to provide more high-quality STEAM learning opportunities for young people. Historically, professional development has been a “sit and get” experience where teachers attend a workshop, take notes, and then return to their classrooms. If they implement the ideas they were presented with, they do so without support, which does not account for what we know about how adults learn.

Summer STEAM takes a different approach and integrates teacher professional development with student learning. That is, certified teachers are hired, through a competitive application process, to serve as camp counselors, and in this role they receive the same STEAM instruction from artists and STEM professionals as the young people who are attending the camp. In this way, young people and teachers become co-learners. Additionally, teachers benefit from collaborative curriculum planning sessions with the artists and STEM professionals who serve as the primary instructors at the camp.

Not only does this collaboration ensure that lessons are engaging, cohesive, and conceptually grounded—for example, STEM professionals ensure that the STEM concepts being taught are accurate—it also constitutes an additional “on-the-job” professional development opportunity. Not all teachers are well-versed in STEM or the arts, so the opportunity to work side by side and learn from STEM and arts professionals can be a highly valuable experience that helps develop stronger content knowledge.

When teachers have the opportunity to learn alongside their students by participating in lessons they are able to grow both their repertoire of lesson plans and their ability to build a STEAM culture in their classrooms. This enables them to implement some of the most effective OST strategies during the school day. Encouragingly, 99 percent of teachers who participated in the 2014 pilot reported learning new activities and lessons to implement in their classrooms (Charleston County School District, personal communication, 2014).

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## Adding STEAM Learning Opportunities to Summer Programs

Summer STEAM represents a powerful vector to deepen young people's engagement with STEM and the arts, as well as an important way to expand learning opportunities and mitigate summer learning loss for all students, and especially those from underserved communities. The following recommendations are based on the lessons learned as Engaging Creative Minds piloted and expanded its Summer STEAM Institute initiative.

**Focus on engagement:** Students who strongly agree that they have at least one teacher who makes them “feel excited about the future” and that their school is “committed to building the strengths of each student” are 30 times more likely than students who strongly disagree with those statements to show other signs of engagement in the classroom—a key predictor of academic success, according to a report by Gallup Education (Blad, 2014). Building strong relationships between students and caring adults (teachers, mentors, counselors) is key to increasing engagement in education, and summer programs are no exception. Starting the minute students arrive for the program, they should be welcomed into a nurturing environment that supports them unconditionally and provides a haven for them to be creative and take risks.

Building strong relationships between students and caring adults (teachers, mentors, counselors) is key to increasing engagement in education, and summer programs are no exception.

### **Cultivate community partnerships for stronger, more sustainable funding models:**

Strong partnerships create tremendous funding opportunities. Nonprofits, school districts, and other community partners who can share resources and identify students and teachers together create more impactful STEAM experiences for students and teachers. Collaborating on grants, program budgets, materials, and resources is a win-win in any community regardless of demographics and income.

### **Build connections among schools and local art and STEM communities:**

Schools cannot be responsible for providing all of the STEAM learning. Teachers are not always STEM professionals or professional artists, and often do not feel equipped to teach STEM/arts skills and concepts. Connecting local artists and STEM professionals to summer program providers is a great way to create a STEAM culture and leverage the resources inherent in the local community. Strong models will carry over into the school year creating even stronger partnerships over time.



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## About the Authors



Robin Berlinsky is Executive Director of Engaging Creative Minds (ECM). She taught first and fifth grades in New York and South Carolina and has been a member of the adjunct faculty at the College of Charleston's School of Education Health and Human Performance since 1996. Prior to joining ECM in 2013, Berlinsky was a founding board member and the first Director of Education for the Childrens Museum of the Lowcountry where she created hands-on arts-integrated curriculum for the exhibits. She is a member of the National Advisory Committee for the National Association of Elementary School Principals, a member of the Kennedy Center Partners in Education Charleston team, and a board member for the Palmetto State Arts Education. Berlinsky holds an M.Ed in Teaching Reading from The Citadel.



Scott Shanklin-Peterson, Chairman, Engaging Creative Minds (ECM), served as the National Endowment for the Arts Senior Deputy Chairman (1993-2001), and developed initiatives to broaden public access to the excellence and diversity of the arts and arts education across America. Previously Shanklin-Peterson was Executive Director of the SC Arts Commission, (1980-1993). As the College of Charleston Arts Management Program Director, starting in 2001, Shanklin-Peterson saw a need to connect schools with Charleston's vibrant arts sector. Knowing the critical value of partnerships, Shanklin-Peterson convened local school districts, arts organizations, artists, city governments and private sector to create, "Engaging Creative Minds (ECM). ECM captures students' and teachers' creativity, imagination and innovation in learning.



Gerrita Postlewait, Ph.D. became Charleston County's (SC) Superintendent of Schools on July 9, 2015. She brings with her a wealth of experiences as an education practitioner and leader at the district, state, and national levels, and as an executive in the private sector. She served as Chair of the State Board of Education, as a member of the national governing board of the American Association of School Administrators, and as a consultant for several districts, states, and national organizations. As Chief K-12 Officer for a foundation, she helped establish the national Innovation Lab Network and co-founded Transform SC, a state-wide business-education partnership that fosters systemic educational change. Dr. Postlewait's goal is to work with educators, students, parents, and community partners to dramatically increase the percentage of students who are ready to step successfully and productively into careers, college, and life.



Rose Wilder, Ph.D. serves as Superintendent of Clarendon School District One in South Carolina and leads the district's efforts to provide stimulating learning environments and comprehensive support systems that produce engaged, motivated, self-directed, and critical thinkers for a 21st century global society. Dr. Wilder is leading several exciting initiatives to improve student learning and engage the community and families in a rural community in South Carolina. In partnership with Engaging Creative Minds' Summer STEAM Summer Institute through funding from the SC Arts Commission, Clarendon One was one of the three STEAM Institute sites that led to Engaging Creative Minds being just one of only four recipients of the 2016 National Summer Learning Association's New York Life's Excellence in Summer Learning Award.