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Cultivating High-Level Organizational Engagement to Promote Novel Learning Experiences in STEAM

Chad Mote

Karen Strelecki

Kate Johnson

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Abstract
Traditional partnerships in K-12 public education often produce low-level organizational engagement among its partners—one partner funds, the other uses the funds Typically a "partner in education" donates funds, which may benefit students through the purchase of new equipment, staff development experiences, or scholarships. In some cases, an organization may send an expert over to speak with the students about their field. This type of philanthropic outreach is indispensable for schools that need additional support and important for students to gain information from the "real world" but does not necessarily translate into deep, meaningful academic impact.

Author/Artist Bio
Chad W. Mote directed the creation of the first rural, STEAM charter school of Georgia as STEAM Coordinator, Board Member for the Steffen Thomas Museum of Art, and Project Director of a Race to the Top, Venture grant. He is currently working as an Assistant Principal for the Rockdale College and Career Academy while completing his dissertation on innovation in the charter sector through the University of Pennsylvania's Graduate School of Education, Ed. Leadership program.

Karen Strelecki has been with the Steffen Thomas Museum of Art for 10 years, serving in many capacities. Strelecki is currently the Deputy Director and Arts Outreach Coordinator as well as being a professional illustrator and a member of the Madison Artists Guild Board.

Kate Johnson is an Art Educator at the Union Point STEAM Academy, a dynamic Artist, and Photographer.

Keywords
STEAM, K-12, Engagement

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Traditional partnerships in K-12 public education often produce low-level organizational engagement among its partners—one partner funds, the other uses the funds Typically a "partner in education" donates funds, which may benefit students through the purchase of new equipment, staff development experiences, or scholarships. In some cases, an organization may send an expert over to speak with the students about their field. This type of philanthropic outreach is indispensable for schools that need additional support and important for students to gain information from the "real world" but does not necessarily translate into deep, meaningful academic impact.

To achieve high-level organizational engagement, educational leaders and teachers must involve community organizations and vice versa in ways that tap into the expertise of its members. K-12 partnerships with institutes of higher education and entities that specialize in informal education such as museums are well documented and usually represent examples of partnerships characterized by high-level organizational engagement. These partnerships usually occur in urban settings where the institutions are close in proximity. They may also have the organizational systems and capacity in place to efficiently obtain funding. For example, the school districts, schools, and institutions involved may have departments and employees that specialize in public relations, development, grant writing, and fundraising to support the collaboration.

Constructing partnerships in rural settings that lead to enhanced student learning requires a more grassroots effort (Pitzel et. Al, 2007). Low student enrollment, small populations, and long distances between schools and potential partners characterize rural districts. Often, the largest employer in a rural area is the school system itself (Hennes, 2001). Teachers, educational leaders, and museum educators in these settings must wear many hats to compensate for a lack of institutional systems specifically designed for partnership building. One such grassroots effort is the innovative STEAM partnership of the Union Point STEAM Academy (UPSA), a new charter school and the Steffen Thomas Museum of Art (STMA).

Here students use a computer programming language, Scratch, developed by MIT in a competition that Strelecki's students entered to create a STEAM logo. It included animation, color, and perspective. Author Mote's mentor Yasmin Kafai, was one of the creators and original researchers of Scratch

The School

The Union Point STEAM Academy (UPSA) is the first, rural K-8 STEAM school in Georgia and has successful converted to a public charter school (Williams & Mote, 2013). The school incorporates project-based learning through the lens of constructionism (Papert, 1980; Papert, 1986; Kafai & Resnick, 1996) with a focus on authentic, experiential learning and meaningful design products. Art and design is integrated into all of the subject areas in both an art class and in the regular classroom setting. The collaboration between the Art teacher and other teachers in other subjects makes planning for great learning possible.

A minimum, year-long theme serves as an anchor for learning to allow for educational experiences that integrate all of the subjects in a meaningful manner, with space for variation and responding to children's questions, interests and child-centered learning The current STEAM focus for the year is on the conservation of natural resources. The STEAM projects that students create at UPSA allows them to see the interconnectedness of all the disciplines and make connections that they would not ordinarily make in classrooms where teaching occurs in academic content "silos." These young students have started a movement at their school, at home, and in their community to recycle and compost. Cross-discipline integration, focusing on the STEAM theme of conservation has been key towards transforming this school from a traditional K-5 elementary to a K-8 STEAM academy.

The Union Point STEAM Academy is integrating arts and design in STEM to help solve long-standing problems in STEM fields, access and equality for traditionally underrepresented students (low-income, female, and students of color) (e.g., May & Chubin, 2003; Frizell & Nave, 2008; Perna, 2009; Vanneman, Hamilton, Anderson, & Rahman, 2009). A major goal for the school is to close the achievement and participation gap for traditionally underrepresented students in the STEM fields and close the confidence gap for young women in STEM (Ross, Scott, & Bruce, 2012; Wang, 2012). The school believes that the arts and the design process are integral towards meeting these goals by developing problem-solving, creativity, and innovative thinking with students (Buxton, 2012; Moses & Cobb, 2002). As such, UPSA partnered with the Steffen Thomas Museum to create applied learning experiences that integrate the arts in STEM so that STEAM is ubiquitous throughout the school culture.

The Museum

The Steffen Thomas Museum of Art (STMA) is dedicated to providing art education programs and projects for children and families in rural Northeast and Middle Georgia communities ("The Steffen Thomas," 2008). Using Georgia artist Steffen Thomas's work as examples of creative expression, the museum provides opportunities for children to develop their own talents, a deeper understanding of themselves and their

connections to all living things, and of their responsibility for preserving the environment. Steffen Thomas himself was interested in science, math, and astronomy, and worked with many different materials and mediums. Steffen Thomas was also trained in engineering, had an innate curiosity in the sciences, and used mathematics in virtually every design decision made in his works of art. STMA emphasizes the art's crucial relationship to developing the "whole" child, championing the belief that the creative thinking process used in the various artistic fields is trans-disciplinary and when applied, increases the student's chances for success in any subject (Catterall, Dumais, & Hampden-Thompson, 2012).

The Partnership

The unique partnership between the Steffen Thomas Museum of Art and the Union Point STEAM Academy began with a visit by the school's STEAM Coordinator and Art teacher to the STMA Annual Membership Meeting. A collaborative relationship between STMA and UPSA based on common interests and philosophies began to emerge. Soon afterwards STMA's board president visited the school to discuss possibilities for the partnership. As a result of this meeting and further conversations, individuals at STMA and UPSA tailored a field trip to include all of the school's fourth and fifth graders around a STMA initiative, *A Day at the Steffen Thomas Museum of Art (A Day @ STMA*).* UPSA students were given a tour of the entire museum and the work of Steffen Thomas. This tour centered on a temporary exhibit, *Abandoned Rural America: The American Family Farm in Transition.* The lead artist of that exhibit attended the class tour, gave a talk about his show in the featured gallery, and assisted the students with a hands-on, minds-on art project—a reverse painting activity based on works from an Abandoned Rural America show. In small groups, docents guided the students through the museum, discussing the significance and the process behind this work that was varied and meaningful for the students

Soon afterwards, the Arts Outreach Coordinator at STMA visited UPSA to discuss a more formal partnership. The discussion also included how the arts in the context of the STMA could be integrated into the existing curriculum at UPSA. Instead

of students just showing up to a pre-scripted program, a plan began to emerge for more population specific ways to engage UPSA students in the museum and in the school. The questions were asked, "How does an art museum and a STEAM school work together to develop programs on-site and off-site that focus on works pertaining to science, technology, math, and engineering? How do the teachers and artists in this partnership communicate in ways that lead to a concept of schooling that moves beyond bricks and mortar? How does a group create a school without walls rather than the traditional pre-defined field trip? How does this partnership create a learning culture between the organizations leading to a higher level of student engagement and generative experiences?"

While the answers are still emerging, these two organizations are taking a grounded theory approach to develop a model of STEAM in practice in their local context to improve student achievement and increase the interest of students in the STEAM areas (Creswell, 2007). They are beginning to look at governing structures and interdisciplinary input to further solidify the partnership. For example, the STEAM coordinator is now a member of the Board of Directors at the Steffen Thomas Museum of Art. UPSA's Art teacher and other teachers plan to participate in professional development on STEAM initiatives this summer at the STMA. As with all successful partnerships in education, members must develop a collaborative relationship and generative discussions outside of their spaces and begin to share their spaces with each other. For rural partnerships that traditionally do not have partnership building systems already in place, these types of grassroots efforts appear to be particularly important in order to implement the ideas that emerge during discussions into practice.

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