



STEM Strategy Session

KANSAS ENRICHMENT NETWORK

JULY 2010

Out-of-school programs surface as crucial opportunities to ignite the imaginations of young people with all that STEM has to offer and to keep those fires burning through middle and high school.

Introduction

For our nation's youth, the path from school to careers in the fields of Science, Technology, Engineering, and Math (STEM) is most often seen as a "pipeline." In the past decade, experts began to recognize that the notion of a direct and continuously flowing STEM "pipeline" has failed to materialize, leading to the creation of an alternative metaphor — the "leaky pipeline." Currently, we are facing a shortage of STEM workers to drive our economy in the coming decades and maintain international competitiveness. Additionally, there is an emerging recognition that our economic future will depend on our students learning 21st Century Skills, such as critical thinking, problem solving, teamwork, and communication. Not every student needs to pursue a 4-year or graduate degree in STEM fields, but some form of post-secondary education or training is becoming increasingly important to economic mobility and prosperity. 21st Century Skills have emerged as a necessity, not a luxury.



We are facing a formidable task, but we have tremendous potential for success. We need to focus on ways to shore-up the "pipeline" into high-growth STEM-related industries and open as many doors as possible to young people by equipping them with the 21st Century Skills necessary for their careers. To do so, we must engage, or re-engage, those students who have



lost interest. The talented, easily persuaded young person who gravitates to STEM may be captured through exposure and the disinterested youth through decently-resourced schools and communities. But questions arise about those students who remain disconnected, such as drop-outs or students who have never had the opportunities to get excited about STEM in the first place. What can be changed to give every young person in Kansas the opportunity for a brighter future?

This overarching question led the Kansas Enrichment Network and Public Agenda to host several community conversations and strategy sessions that led to an increased understanding of both STEM and out-of-school time issues. Out-of-school programs surfaced as crucial opportunities to ignite the imaginations of young people with all that STEM has to offer and to keep those fires burning through middle and high school when interest wanes or disappears altogether. To realize success, we need concerted efforts to develop a robust and coherent system for developing, delivering, and evaluating these high-caliber learning opportunities found in quality out-of-school programs. However, there was a vital perspective that was missing. What did the youth think? That question was addressed

Introduction *Continued*

thanks to involvement with the Network's newest initiative specifically for young Kansans called "For Youth, By Youth."



That is how we came to host the first-ever youth-only conversations in Kansas. Using the Public Agenda Community Engagement model, we uncovered youth opinions, values, and beliefs from both engaged and unengaged or uninterested middle and high school students. We learned that students lacked exposure to hands-on science learning in elementary school. Correspondingly, interest in math and science faltered because the subjects never seemed relevant. Some students, including some who had dropped out, said that school didn't provide them with challenges that kept them engaged. Others shared that they got by in school by learning how to cheat on tests before discovering that it was too late to go back and actually learn math and science. The students' feelings of unpreparedness surfaced when things started to get hard, which was usually around middle school. As one student put it, he stopped learning "when math started including letters" instead of just numbers.

Therefore, with a desire to look beyond the school day for assistance, a concern for both engaged and less engaged youth, and a commitment to improve the lives of young people in Kansas, Public Agenda and the Kansas Enrichment Network embarked on another strategy planning session with a Kansas focus.



"I made so many connections I had to go out to my car to get more business cards!"

Event Logistics

The Kansas STEM Strategic Planning Session was held on June 24 at Bacchanalia in Overland Park, Kansas, and brought together nearly 50 stakeholders from across the state, including legislators and government representatives, agency and business leaders, educators spanning Kindergarten through college, STEM experts, parents, and afterschool providers. A group as diverse and influential as the one assembled offered a one-of-a-kind opportunity for networking and provided a wealth of varied experiences to inform the process.



The discussion centered on three emerging themes: improving access to STEM opportunities, with an emphasis on expanding the role of out-of-school programs' involvement; increasing student engagement, or re-engaging them, in STEM; re-imagining the state-wide STEM system. Four questions guided the conversation and led to a rich dialogue and sound ideas for action:

What are the most effective or promising alternative pathways to inspire interest and achievement in subjects/careers for disengaged youth?

How are we already making progress on alternate STEM pathways, and how can we strengthen those efforts?

Are there pathways that we're missing altogether? If so, how can we begin to establish them?

What are the most important things we can do to give all students great opportunities to become engaged in STEM?

Mapping the Scene

Out-of-school programs offer valuable opportunities in experiential learning, open-ended study, mentoring, shadowing, career exploration, all of which compliment STEM success. Funding and sustaining quality afterschool programs has been challenging, but times are changing. Kansas' leaders and community members have started demanding greater communication and collaboration; eliminating the territorialism between formal and informal educators; formalizing a system for expanding and improving opportunities; and generating strategies to get stakeholders out of their silos to work together. Our Kansas youth need this strong commitment.

Several issues surfaced that mirror much of what we know. For example, we need enhanced training opportunities for school teachers and access to appropriate STEM curricula; a solid link that creates a seamless flow between school-day learning and afterschool education to increase student success; and the involvement of businesses and professionals, who need to be connected with programs, schools, and STEM experts.

Discussing these issues led to a number of unanswered questions. Have we defined STEM success? Is it exposure to STEM literacy, realization that STEM is fun, or buy-in to STEM careers? These questions led to the participants to cautiously consider several ideas, including the notion that career clustering can stifle creativity and track young folks too early in life. Should we emphasize exploration and discovery more than adoption of a career path? Similarly, both "hard sciences" and "soft sciences" need consideration. Soft sciences must be valued along side the emphasis on bioscience, wind energy, and computer programming. And not to go unnoticed, unequal resources exist, limiting exposure for some youth. How might we bridge that gap?

To address that question requires system-building efforts that must be tackled through reciprocal relationships and open communication among business, organizations, and the community at large. Collaboration and shared efforts are critical for success.

Making Progress

What can be done quickly in today's economy? What are the opportunities that require little time and cost to implement, i.e. the "low-hanging fruit"? Similarly, what are the ambitious projects requiring significant time and greater resources to implement, i.e. the "high-hanging fruit"?

"Low Hanging Fruit"

The low-hanging fruit encompasses convening meetings, talking to each other, and formulating plans. We need to carve out time for networking and collaboration; building reciprocal relationships; and establishing multidisciplinary teams. Everyone can and should be involved. Important networking partners may include the governor's office, which has both power and resources, as well as local and state governments, which often have tight budgets and overwhelmed leaders. Businesses and companies in STEM-related fields also represent a resource in their ability to provide outreach opportunities and an understanding of future needs. In addition, universities, community colleges, and technical schools could offer an increased amount of STEM courses.



Further, existing organizations and groups can assist by coordinating services and sharing information. It also is important to recognize that family involvement is important if we want to address their needs. Part of the process includes knowing what exists and where there are holes; collecting information on best practices and reviewing successful programs; and examining what has worked and why. Finally, collaboration and linkage needs to occur between schools and afterschool programs as both present valuable opportunities to engage students. To reap the greatest benefits for Kansas youth, schools and out-of-school-time providers must be partners, not adversaries.

"We need a seamless flow between school-day and afterschool learning."

“We need to carve out time for networking and collaboration; building reciprocal relationships; and establishing multidisciplinary teams.”

Making Progress *Continued*

As we move forward, it becomes critical that we target audiences from whom we want STEM achievement – the YOUTH themselves. Many organizations hold exclusive, adult-only conversations about the fate of youth programs and youth activities behind closed doors with the youth literally on the other side of that door. Youth-led conversations open doors to the youth as a vehicle to empower them to voice their opinions on the subject on which they tend to be the authority – being young.

The need to continue networking, collaborating, and organizing indicated that this strategy session only brushed the surface. Calls for increased engagement opportunities rang out among the groups – don’t stop here! Bring more people to the table beyond current collaborators. Span child advocacy groups, STEM marketing and outreach partners, media, foundations, youth, the Board of Regents, government-appointed folks, faith-based, campus STEM groups, national government, parks and recreation, police and greater diversity from the business world to develop multidisciplinary teams to formulate action steps.

In support of this strategy, we collected documentation of its success. A simple survey conducted at the June 24th event resulted in:

97% indicating to be kept in the loop of STEM efforts in Kansas;

70% of the participants offered assistance through an open-ended question.

Comments to the open-ended question included a willingness from legislators to write legislation and an offer to lead the discussion with the House Education Committee. Other contributions spanned advocating with policy makers; offers of assistance with curriculum development and professional development; and grant writing services, while others volunteered efforts aimed at networking, dissemination, and outreach. Of great significance in the attempt to drive this momentum effectively was the willingness of University researchers to conduct research projects to measure results. Furthermore, numerous others, unable to be at the event, indicated a desire to be kept informed on future events. If one strategy session produces energy like this, follow-up sessions could empower the STEM movement in Kansas.

“High Hanging Fruit”

DATABASE—What began as “low hanging fruit” evolved into “high hanging fruit” as collaborators considered the creation of a comprehensive database. Originating as simply a means to identify existing programs and services, the idea expanded to listing potential business partners, referencing available resources, and listing willing volunteers. Hence, low-hanging became a bit more ambitious of an undertaking.

The call is for an environmental scan or landscape study that collects existing out-of-school opportunities in Kansas that could partner with schools to increase services for youth. Out-of-school opportunities offer a safe, engaging place for kids that can assist with academics, help working families, and develop workforce skills. These experiences also have a flexibility that schools do not have given the current nature of testing and regulations. Out-of-school programs feature an environment conducive to discovery, inventing and creating, exploring, testing and retesting, critically analyzing, and problem-solving — a feature could create the optimal environment to re-engage the disengaged as well as build skills for those already interested in STEM.

“The call is for an environmental scan or landscape study that collects existing out-of-school opportunities in Kansas.”



Making Progress *Continued*

Building on that concept, the database expands to include where business partnerships are or could be; what works and what doesn't; a toolkit for volunteers; resources and training availability; and a central location for communication among multidisciplinary teams. Electronic links to services offered by existing groups allows for easy access from homes, schools, libraries, businesses, and community education centers. As part of the system-building in Kansas, decisions can be made regarding coordination, maintenance, and marketing the database tool.



A second and more long-term suggestion in the area of high-hanging fruit involves the creation of *true* internships, externships, mentoring, job shadowing, and apprenticeships. Time-commitment and coordination of efforts suggest strategic planning. Models of possibilities offer a vision for potential. One such example shared at a previous conversation was pinpointed (*A New Day for Learning*, <http://www.newdayforlearning.org/inaction.html>). Researching successful ventures eliminates reinventing the wheel, but requires capacity. Kansas participants at this event yearn to bring these experiences to youth, especially those disengaged and/ or uninterested young people.



An out-of-the box example brought to light in this session included an incentive-based system that encourages partnerships which lead to 21st Century communities. Patterned after *Full Service Communities* or *Promise Neighborhoods* the concept suggests an intriguing full-scale model for communities. What other valuable ideas might arise if diverse, statewide engagement opportunities tackle systems thinking? The possibilities for Kansas youth reach endless proportions when public engagement is the driving force.

Concluding Themes

So, what is STEM success? How is it realized? What is the connection to the disengaged and/ or disinterested student? Can experiences be structured to bring these youth back through STEM? Can ALL youth benefit from exposure to discovery and exploration through STEM arenas? How can we efficiently and effectively use technology to support our work? What previous strategies involving business resulted in success? If they are still in existence, where are they and what do they offer for systems thinking in Kansas? If businesses pulled away, what caused that sinking ship and what lessons can be learned to make it successful in Kansas?

The stage has been set, but many questions remain. We believe that it is possible to achieve feasible and effective solutions to the problems that face STEM education through the use of strategy planning sessions. These sessions bring diverse groups of community members together and break down the territorial barriers that exist between them. For example, one way in which the sessions will serve to link differing groups is to bring informal science educators and school day educators into conversation with each other. In collaboration, these two groups could serve to spark an interest in STEM in students who are willing to pursue STEM careers.

Additionally, our introduction of youth into the conversation engendered a rich dialogue that included the voices of the very subject of the session. Unsurprisingly, youth responded positively overall because they were afforded the chance to share in the discussion and planning. Solutions driven by the community represent a collaborative and unified front through which STEM in Kansas can become a success.



“It is possible to achieve feasible and effective solutions to the problems that face STEM education through the use of strategy planning sessions.”

Strategy Session Participants

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Tom Baker, Environmental Systems Research
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Mary Brock, Science Pioneers

Eunice Brown, FIRST Robotics

Tammy Clary, Youth Build

Pat Colloton, KS House of Representatives

Jackie Counts, University of Kansas

Michael Crawford, University of Kansas

Alexis Denny, Girl Scouts

Marcia Dvorak, Kansas Enrichment Network

Nathan Eberline, League of KS Municipalities

Eddie Estes, Western KS Manufacturing Assoc.

Sarah Fizell, Strategic Communications of KS

Stacey Freeman, Kansas Enrichment Network

Judy Frick, Communities in Schools KS

Will Friedman, Public Agenda

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Cheryl George, Coffeyville School District

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Elaine Johannes, Kansas State University

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Jarius Jones, KCK Public Schools

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Lisa Keel, FIRST Robotics

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Holly Lamar, Society of Women Engineers

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