



GOVERNOR'S STEM ADVISORY COUNCIL

dedicated to building a strong STEM education foundation for all Iowans

Iowa STEM Network Scale-Up 3-Year Partners Performance Summary

December 9, 2014

As Iowa STEM approaches the fourth year of exemplary program scale-up, our four original program partners have been asked to provide performance reviews. Below is a summary of key findings of those reports. The original reports are readily available for review upon request to the executive director.

3-year Scale-Up Program Partner				
Program Goals	AWIM	EiE	Hyperstream	CASE
Inspire Iowa Youth in STEM	A five-year longitudinal study of AWIM shows, "students who participated in AWIM sought out more STEM related experiences over time" and "participation in one AWIM Challenge, including working in student teams to complete an authentic engineering design experience, is enough to start students on a path of knowledge and interest in engineering." Research also show that, "students who used AWIM for four to six weeks, on average, showed stronger understanding of engineering and greater increases in attitudes toward engineering over time." (Goodman, 2010)*.	Iowa teachers who have implemented an EiE curriculum with their students have responded that students have increased their understanding about engineering. A June 2010 study indicated that students who completed the curriculum were significantly more likely than their peers to report interest in being an engineer. These students also were significantly more likely to report interest in and comfort with engineering jobs and skills, and to agree that scientists and engineers help make people's lives better.	From Sept 2013 to May 2014, + 12% (from 76% to 88%) HyperStream students definitely or possibly interested in exploring tech careers.	46 percent more interested in Science, 33 percent more interested in Technology, 42 percent more interested in Engineering, 23 percent more interested in Math and 47 percent more interested in STEM Careers. 50% of female more interested in Science. Total of 88 and 95 percent "more interested" and "just as interested."
	From <i>SAE AWIM Optimization Survey (national)</i> , 72% of students displayed a significant increase in the math and/or	Direct evidence of academic achievement as the result of completion of an EiE curricular	Participants learn skills, such as programming, robotic engineering	More than 42% of all CTE program completers were Ag. Ed. program completers. One educator writes, "CASE increased the level of student

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Administrative Office • 214 East Bartlett Hall • University of Northern Iowa • Cedar Falls, Iowa 50614-0298
 Telephone: 319-273-2959 • Fax: 319-273-2779 • email: info@iowaSTEM.gov • www.iowaSTEM.gov

<p>Improve Iowa Youth Achievement in STEM</p>	<p>science scores.</p>	<p>unit is not collected by the PI. However, the EiE units give teachers and students the opportunity to apply their science and math understandings in an authentic design challenge through science and engineering practices which are outlined in the Framework for K-12 Science Education.</p>	<p>concepts, web development, network administration, user interface techniques, animation, multimedia techniques, and more. And gain 21st Century skills (teamwork, problem solving, creativity, communications, innovation, project management, etc.).</p>	<p>engagement from 40% to 90%.” In 2014 ,181 teacher certifications for 4660 students to enroll in a CASE course, a 448 percent increase in enrollment.</p>
<p>Diversify participation in STEM programs</p>	<p>Classroom implemented program thus participation is as diverse as the classroom. Enables program to reach and expose a 50/50 female to male ratio. And exposes students as young as kindergarten to STEM concepts.</p>	<p>All units begin with a story that features boys and girls from a variety of race/ethnicity backgrounds. It has been reported that EiE works well with all students, whether low- or high-achieving, including students: with cognitive challenges, linguistic challenges, behavioral challenges, who are gifted and talented, who are girls, who are children of color, and who are at-risk in other ways. Of all these populations teachers agreed most strongly that the curriculum worked with children of color (Faux, 2008).</p>	<p>Participants are 60% rural and 40% urban. Last year 27% were female, exceeding the national avg. where less than 20% of females earn computer science degrees.</p>	<p>> 13 percent of enrollees have an IEP. 29.3 % are classified as having a low socioeconomic status. CASE courses have attracted 7 percent greater female enrollment than typical agricultural education course.</p>
<p>Sustainability beyond Council funding</p>	<p>Delivering AWIM through major partnerships with: GM Foundation, Kia, Chrysler Foundation, Caterpillar, John Deere, Bosch, Johnson Controls, AVL, FEV, Alcoa, Honda, Honeywell, Nissan, Borg Warner, Denso, Dana Corp.</p>	<p>Teachers who have gone through EiE Professional Development and received materials may incorporate them into their school’s curriculum. All aligned to the</p>	<p>Developing a long-term financial plan and monetization model to support this growth and sustainability. Has received significant</p>	<p>Critical mass being approached: 57% of Iowa Ag. Educators are now certified in at least one course (– pre-scale-up = 13.9%). > 26% are now certified in at least two courses (pre-scale-up = 6.7%). CASE annual growth rate at 10% for ALL Iowa agricultural</p>

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	just to name a few. AWIM helps schools develop long-term relationships with local industry that have the vested interest in supporting local community-based educational outreach offerings.	Framework for K-12 Science Education, specifically the scientific and engineering practices.	contributions from Principal Financial Group, IBM , ISU and IDED.	educators. Iowa CASE Lead Teachers (Certified to teach & mentor other teachers) have nearly tripled and Iowa Master Teachers have increased 350%. In addition, local schools have assumed complete responsibility for providing consumable materials on an annual basis.
Reduced cost per participant over time	Cost-per-student average of \$20-22 per student nationally. The cost-per-student in 2013 for Iowa AWIM was \$10.33.	Costs are level year by year due to kits and training. However, the Van Allen Science Teaching (VAST) Center specializes in providing professional development services for teacher inservice purposes.	Fee reduced for returning schools, since they have already gained a base foundation of our program. Proposed cost per participant was \$394 but high participant rate and steady cost resulted in 2013-14 cost-per-participant of \$225. Big savings for Iowa.	86% of participating educators report coordinating with their science department to offset equipment needs and ensure supplies purchased are not redundant to those previously in the school. Additionally, through the supplies provided by the Scale-Up program if AFNR course is Scaled-Up, LEA receives efficiencies of nearly \$65,000 to implement the remaining suite of CASE courses – enough to fully implement the final two courses. Additionally, discounted rates have been negotiated with equipment and supply vendors (Ward's Natural Science, Vernier and BioRad). Through these scale-up partnerships nearly \$70,000 has been saved not including free shipping of most supplies directly to local schools.
Met cost-sharing commitment	2013 year-end cost share report, SAE delivered \$88,679.40 in goods and services.	Grant Wood AEA VAST Center provides science consultant services that are knowledgeable about effective Professional Development and the implementation of the EiE curriculum in particular.	2013-14, provided a total of nearly \$800,000 in cost-share contributions.	As part of the first three years of the scale-up program, the Iowa FFA Foundation has committed to administering the program without administrative fee reimbursement – saving the program nearly \$160,000. Additionally the Iowa FFA Foundation has received more than \$275,000 in contributions to offset additional expenses associated with hosting the professional

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				<p>development institutes for agricultural educators. Nationally CASE has been able to leverage the increased participation to raise more than \$5 million for continued growth and curriculum development. While locally more than 44 percent of Scale-Up participants found more than \$151,000 of local contributions to offset remaining equipment needs.</p>
<p>Recommendation of the Executive Director and Regional STEM Managers regarding continuance to the committed renewal year 2015-16</p>				
	Yes	Yes	Yes	Yes

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