



STEM Learning Center

Annual Stakeholder Report

July 2015

At the end of this first full year as an official center of the University of Arizona, we are excited to report on progress for the STEM Learning Center (SLC) across five focus areas, including the launch of our new website at <http://stem.arizona.edu/>. Please take a look – we will continue to add resources to the website over time, and ask that the community help us to populate our Community STEM Events calendar by submitting information about your upcoming STEM events.

Much of our work during the year has been focused on strengthening the Center's strategic supports that will allow us to better collaborate with our various stakeholders. We're pleased to share highlights of these accomplishments here to give you a more complete picture of all that has been happening as we plan for an even more productive year ahead.

Bruce Johnson & Chris Impey, Co-Directors
Jen Fields, Associate Director
Sara Chavarria, P-20 Education Pathways
Michelle Higgins, Research & Evaluation
Martha Ostheimer, Workforce Development
Deb Tomanek, Undergraduate Teaching & Learning

▲ Research & Evaluation

- Working with the UA Office of Research & Discovery to formalize a more strategic, systematic and intellectually rigorous approach to broader impacts for more successful STEM grant proposals.
- Attended the annual conference of the National Alliance for Broader Impacts, an NSF-funded initiative. The goal of NABI is to create a community of practice that fosters the development of sustainable and scalable institutional capacity and engagement in broader impacts activity.
- Serving on a committee that is creating a guiding document for researchers and reviewers to assist them in writing and evaluating the broader impacts portions of proposals submitted to NSF and other funding agencies.
- Supported UA research through coaching on best practices, public outreach design and development, program evaluation, and broader impacts; to date, the Center has supported 32 grant proposal submissions totaling \$106 million.
- Participated in informational panels hosted by UA Research Development Services to raise awareness of broader impacts requirements regarding NSF CAREER grants.
- Providing resources on our website for UA faculty and staff and community members to assist with grant writing, program design, and evaluation.

- In partnership with the College of Engineering, submitted a \$1.5 million grant proposal to the National Science Foundation to conduct research on STEM learning, entitled *Persistence in STEM: Modeling Correlation and Causation of Interventions Along the STEM Pipeline*.

▲ Workforce Development

- Continue to grow and develop the Southern Arizona STEM Workforce Network, which now includes 46+ university, community, public sector, business leadership, and educational partners; participants collaborate to create a robust STEM education pathway that begins with pre-K education and extends through elementary, high school and college with a goal of developing and retaining the highest-quality STEM workforce.
- Serve on the following committees to align the Center's workforce development initiatives with other initiatives across the region and state: Arizona STEM Network's Business Advisory Council; Arizona Technology Council's Workforce Development Committee; TREO's Talent Committee; Tucson Metropolitan Chambers' Workforce Readiness and Educational Alignment Committee; and the Arizona State Chambers' Arizona Manufacturing Partners Committee.
- In response to the findings of the Southern Arizona STEM Workforce Supply and Demand Report commissioned by the SLC last year and released to the public in October 2014, facilitated a collaborative partnership with UA Career Services, UA Student Engagement and UA STEM College and Department Engagement Coordinators to develop a shared, streamlined process to be used by businesses to recruit and hire UA students as STEM interns. Developed plans for centralized data collection and metrics to assess impacts.
- Worked with Pima Community College and local high school JTED programs to develop a similar streamlined process for businesses that want to hire PCC and high school students for STEM internships.
- Hosted the *STEM Internship Business Forum* to introduce businesses to the streamlined process for recruiting and hiring UA, PCC and High School students for STEM internships. President Hart and Mayor Rothschild provided welcoming remarks regarding the importance of the initiative in supporting workforce and economic development in Southern Arizona.
- Worked with the Alumni Association, Career Services and UA News to develop a series of articles profiling UA students who have worked as STEM interns and introducing the new streamlined process that is being used across UA STEM Colleges. These pieces will be released in the fall in advance of the October Career Fair.
- Partnered with Raytheon to establish the RWEST Jr. Mentoring Program which matches women engineers at Raytheon with UA undergraduate female engineering students. The program provides insight into education tracks, exposes them to internship opportunities, develops professional relationships, and addresses the need to promote persistence of young women in engineering disciplines, which will lead to more women engineers.
- Partnered with the AZ Tech Council to plan the inaugural TechJunction Tucson Information Technology Conference, held at the TCC in March 2015. Developed educational panels for the conference that included UA Faculty and UITS leads. Presented the findings of the *Southern Arizona STEM Workforce Supply and Demand Report* and the data driven solution to the projected workforce experiential gap that the research identified. The Dean of Business

programs at PCC, the Assistant Director of Workforce Development at the STEM Learning Center and the Curriculum Director at JTED participated as panelists on the workforce development educational panel. Over 500 IT professionals attended the event.

▲ K-12 Teaching and Learning

- Supported the College of Education's *Teachers in Industry* program by securing a third year of funding from the Freeport-McMoRan Copper & Gold Foundation plus an additional \$250,000/year support from the Thomas R. Brown Family Foundation. Notably, the program is expanding across Arizona, and nationally, with the recognition of the national organization, Change the Equation, as an exemplary program.
- Working with the College of Education, contracted with a private firm to market the *Teach Arizona* program to increase the numbers of secondary teachers prepared through the UA, with the goal of doubling the size of the program next year.
- Collaborating with Tucson Unified School District on a Math-Science Partnership for professional development workshops designed to bring hands-on learning in physics to elementary school teachers.
- Presented "*The Five 'E's of Inquiry*" workshop on best practices in STEM education at the Arizona Statewide Out-of-School Time Conference & Awards of Excellence.
- Partnered with the Colleges of Science and Agriculture and Life Sciences to present "STEM in Action" at the Arizona Science Teachers Association Conference, a presentation on UA STEM programs and resources for educators.
- Serve on local K-12 advisory boards and steering committees, including Boys & Girls Club, AZ STEM Network, City High 612 Complex, Mansfeld STEM Magnet School Committee and others.
- Partnering with the College of Education on the *Improving Teacher Quality* grant to provide professional development in Next Generation Science Standards and assessing movement towards goal achievement for school leadership teams.

▲ Improving Undergraduate Education

- Drs. Deb Tomanek and Chris Impey continue to participate in the UA's STEM Undergraduate Education Initiative grant from AAU, which seeks to give thousands of science and engineering majors at the UA a solid understanding in core STEM disciplines.
- Continued participation in the Leadership Team for the UA's 100% Student Engagement Initiative.
- In partnership with the local non-profit organization Higher Ground, the SLC was awarded a grant from the UA's 100% Student Engagement Initiative to provide leadership opportunities for undergraduate students.

▲ PK-20 Education Pathways

- Created a searchable database of UA STEM outreach programs and a calendar of both UA and community STEM events for inclusion on our website. UA employees are invited to submit

information about their STEM outreach programs, while both UA and wider community members are invited to submit STEM events for the calendar.

- Expanding our partnership with Amphitheater Unified School District to support their STEM efforts in after-school programming and participation in UA STEM programs.
- Consulted with Arizona Youth University on best approaches to launch NASA robotics and rocketry camps for summer 2015 and helped recruit campers from local school districts.
- Continue to connect community members with UA facilities and labs, programs, and resources.
- Facilitated disbursement of scholarships from the College of Education to enable more children to participate in UA summer programs.
- Advised the local *Community Share* initiative as they began design of a web-based tool for teachers to find UA and community expert resources; helped recruit UA staff, faculty, and students to register for *Community Share* as experts.
- Invited representatives from NASA's Armstrong Flight Research Center to present information about internship opportunities to UA STEM undergraduate students. Partnered with UA Career Services to promote the event and register students.
- Submitted the TRIO *Student Support Services* grant proposal working with the Colleges of Science and Medicine to provide STEM formal and informal learning experiences to first-generation and low-income students; if funded, will act as fiscal agent and provide oversight for the \$1.1 million project.
- Advised multiple programs on best practices in designing new summer camp programs: Eller College (GenCyber Camps), Arizona Youth University (Rocketry Camp and Robotics Camps), and College of Pharmacy (Environmental Boot Camp and Toxic Detectives Camp).