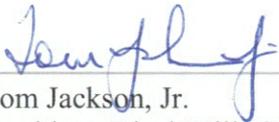


Sanford Science Education Center

Strategic Plan

March 30, 2016



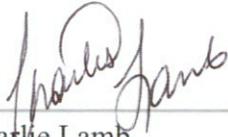
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Sanford Science Education Center Strategic Plan 2016

Mission

The mission of the Sanford Science Education Center is to develop and facilitate rich, innovative learning experiences that

- deepen understanding of science, technology, engineering, and mathematics,
- engage and connect diverse audiences, and
- inspire and prepare the next generation of scientists, engineers, mathematicians, and educators.

In support of its mission, the Center draws upon and leverages the science and engineering of the Sanford Underground Research Facility, the educational resources of Black Hills State University, the capacity for public engagement of the Sanford Lab Homestake Visitor Center, the human resources and unique facilities of all three institutions, and their setting within the Black Hills.

Vision

The Sanford Science Education Center will be a leader, a resource, and a catalyst for the improvement of science, technology, engineering, and mathematics education.

Core Values

- * Inclusivity and broadening participation
- * Learning through inquiry, exploration, and research experiences
- * Partnerships
- * Honoring cultural and historical contexts

Goals

1. Transform the teaching and learning of science, technology, engineering, and mathematics from early childhood through post-secondary education.
2. Develop and sustain partnerships to achieve broad engagement and collaboration across diverse audiences and stakeholder groups.
3. Increase appreciation of the nature, value, and application of science, technology, engineering, and mathematics.
4. Foster an innovative workforce in support of a robust knowledge-based economy.

Action Plan

Goal One: Transform the teaching and learning of science, technology, engineering, and mathematics (STEM) from early childhood through post-secondary education.

Actions Steps:

1. Articulate the Center's vision for STEM education.
 - a. Establish web pages that explain the Sanford Science Education Center, articulate its vision, and identify strategies for realizing this vision. Host these pages on the Black Hills State University (BHSU) website.
 - b. Sharpen the vision for specific audiences, including K-12 students, undergraduates, educators, and the general public, across an array of educational settings, both formal and informal.
2. Implement innovative and engaging programs for K-12 students.
 - a. Host K-12 field trips that feature the Sanford Lab facility, its operation, and its research. Incorporate hands-on investigations and facility tours.
 - b. Visit K-12 schools and classrooms. Build awareness and deepen understanding of the Sanford Lab facility, its operation, and its research. Place high priority on visiting schools that serve populations historically underrepresented in STEM.
 - c. Refine and develop new K-12 curricular modules that link to Sanford Lab. Refine dissemination strategies to support K-12 teachers in implementing the modules within their classrooms.
 - d. Capitalize on advanced technologies, including video connections to the underground, virtual tours, and online access to scientific data.
 - e. Support after-school clubs and youth-serving organizations that provide STEM enrichment outside of the formal K-12 curriculum.
3. Provide professional development for educators (including pre-service teachers)
 - a. Strengthen educators' content knowledge, pedagogical skills, and understanding of student thinking.
 - b. Support teachers in making connections between their classrooms and Sanford Lab.
4. Support innovations in university instruction
 - a. Create active learning modules that connect university coursework with Sanford Lab.
 - b. Provide leadership and support as university faculty transition their instruction to more active learning models (e.g., co-planning, co-teaching, classroom coaching, onsite and offsite professional development).
 - c. Provide forums for university faculty and K-12 educators to learn from one another about effective pedagogy.
 - d. Review, support, and showcase instructional innovations at the university level.
 - e. Sustain and strengthen Davis-Bahcall Scholars program. Track and report academic and career trajectory of program graduates.
 - f. Support the utilization of innovative learning environments at BHSU.

5. Sustain and expand opportunities for university students, university faculty and staff, and K-12 teachers to participate in, contribute to, and learn from their involvement in the work of the Sanford Underground Research Facility and of the Sanford Science Education Center.
 - a. Support the utilization of underground research space in ways that involve undergraduates and K-12 teachers.
 - b. Promote and increase involvement by institutions of higher education across South Dakota in the BHSU Underground Campus. Develop the BHSU Underground Campus into a resource for the entire South Dakota regental system.
 - c. Support involvement across disciplines –
 - i. within science, technology, engineering, mathematics, and education, and
 - ii. in such fields as history, the humanities, American Indian studies, mass communications, fine arts, business, and instructional technology.
6. Function as a learning laboratory for the development, testing, and refinement of curricular materials and instructional practices.
 - a. Serve as a model of effective instruction at multiple levels - for examination and emulation by others - across South Dakota and nationally.
 - b. Learn from and contribute to educational scholarship, staying current with STEM education literature, documenting and disseminating lessons learned, publishing papers, and presenting research findings nationally.
7. Pursue new grant funding to support the enhancement of STEM education for South Dakota and the broader region.
 - a. Partner with K-12 schools, universities, research facilities, informal science institutions, cultural institutions, and science-related businesses.
 - b. Seek funding opportunities and submit funding proposals directly related to this goal.

Goal 2: Develop and sustain partnerships to achieve broad engagement and collaboration across diverse audiences and stakeholder groups.

Actions steps:

1. Create an inventory of existing partnerships and alliances.
 - a. Describe the nature of each partnership, including activities (current or future), points of contact, outcomes, and strength of partnership.
2. Sustain and strengthen existing partnerships and develop new ones across South Dakota state agencies (e.g., Department of Education, Governor's Office of Economic Development, Department of Labor, and Department of Tourism).
3. Strengthen existing partnerships and create new ones with the goal of broadening American Indian involvement.
 - a. Assess the status of existing partnerships; reconfirm contact persons; note results and accomplishments.
 - b. Establish new partnerships; identify mission/vision/scope of work/contact persons/contact plan.

4. Strengthen existing partnerships and create new partnerships with Science Collaborations.
 - a. Assess the status of existing partnerships; reconfirm contact persons; note results and accomplishments.
 - b. Establish new partnerships; identify mission/vision/scope of work/contact persons/contact plan.
5. Support efforts to integrate the arts with science, technology, engineering, and mathematics.

Goal 3: Increase public appreciation of the nature, value, and application of science, technology, engineering, and mathematics.

Action steps:

1. Host or participate in public engagement events.
 - a. Neutrino Day
 - b. Northern Plains Science Festival in Sioux Falls
 - c. Other public events and presentations
2. Support regular review and updating of exhibits at the Sanford Lab Homestake Visitor Center facility
3. Support regular review and updating of exhibits in the lobby of the Sanford Science Education Center at BHSU.
4. Increase the Center's visibility and stature within the national Association of Science and Technology Centers.
 - a. Achieve recognition as an established center.
 - b. Gain appointment to at least one committee or board.
 - c. Present at least one session per year at annual meeting.
5. Develop a focused community engagement strategy to include
 - a. Social media campaign
 - b. Press releases
 - c. Public events
 - d. Visitor center plan
 - e. Jonas Science plan
6. Develop and disseminate "so-what" messages that communicate the value of scientific research and reference the scientific endeavors of the Sanford Underground Research Facility.
7. Communicate the impact of the lab and the Sanford Science Education Center partnership on the state and region.
8. Seek funding opportunities and submit grant proposals directly related to this goal.

Goal Four: Foster an innovative workforce in support of a robust knowledge-based economy.

Action steps:

1. Identify ways the Center will play a strategic role.
 - a. Gather ideas from other organizations / institutions
 - b. Explore ways to measure impact.
2. Learn from and partner with state agencies such as the South Dakota Department of Labor, Department of Education, Department of Tourism, and the Governor's Office of Economic Development regarding this goal (linked to Goal 2).
3. Provide leadership and support for Sanford Lab's summer internship program (linked to Goal 1, Action 5).
4. Teach about science, engineering, mathematics, and technology-related career opportunities.
5. Participate in career fairs.