

**Logic Model**  
**Iowa-Illinois-Nebraska LSAMP: IINSPIRE – A STEM Partnership for Innovation in Research and Education**  
**5+ Year Alliance (2016-2021)**

**Overall Goal:**

The IINSPIRE LSAMP goal is to double the number of underrepresented minority (URM) STEM baccalaureate graduates in the alliance to 350 graduates, to sustain the increases, and thus broaden the participation of underrepresented minorities in STEM education in the Midwest.

**NSF LSAMP Priorities (NSF 15-594):**

(AMPa) Increase individual student retention and progression to baccalaureate degrees for underrepresented racial and ethnic groups.

(AMPb) Enable successful transfer of underrepresented students from 2-year to 4-year institutions in STEM programs.

(AMPc) Increase access to high quality undergraduate research experiences.

(AMPd) Facilitate seamless transition of underrepresented students into STEM graduate programs.

**IINSPIRE Objectives:**

1. Implement and extend comprehensive, evidence-based, innovative, and sustained strategies to achieve LSAMP priorities (AMPa-AMPd), resulting in the graduation of well-prepared, highly-qualified students from underrepresented groups who pursue graduate studies or careers in STEM. These include:
  - i. Evidence-based practices that support student academic, social and professional development and progress in STEM majors.
  - ii. IINSPIRE-specific student experiences and mentoring at each institution, leveraging programs and resources that serve URM STEM students.
  - iii. Undergraduate research experiences and training leading to a research certificate.
  - iv. STEM transfer partnerships between 2-year and 4-year institutions.
2. Engage alliance faculty to support their mentoring of students, use of evidence-based and inclusive teaching practices, and understanding of URM STEM student success.
3. Investigate research questions and collect data to study the effect of program activities, better understand URM STEM student success and institutional environment, inform and guide programmatic efforts, and contribute to scientific knowledge.
4. Strategically manage the organizational, financial, data, and communication aspects of the project within/across institutions and with partners, including alliance-wide activities that strengthen collaborative approaches.
5. Evaluate institutional and alliance program effectiveness and sustainability guided by logic model outcomes.
6. As broader impacts, improve educational pathways, training, partnerships, networking, and infrastructure that contribute to inclusive institutions and a diverse STEM workforce prepared to address societal needs.

Resources	Activities	Outputs	Outcomes	Impacts
<ul style="list-style-type: none"> <li>• NSF funding</li> <li>• PI team</li> <li>• Alliance Office</li> <li>• Steering Council (Campus Directors)</li> <li>• Governing Board</li> <li>• Faculty mentors</li> <li>• Peer mentors</li> <li>• Graduate assistants</li> <li>• Research team</li> <li>• Institutional offices, programs, resources at each alliance member (institutional letters)</li> <li>• Industry, academic, governmental and community partners (letters of collaboration)</li> <li>• Cross-institutional programs: ISU APP/E-APP, Iowa EPSCoR, articulation agreements, Governor’s STEM Advisory Council</li> <li>• Institutional data</li> <li>• Evaluation expertise</li> <li>• Conferences for student professional</li> </ul>	<p><b>Student Academic/Professional Development (Objective 1)</b></p> <ul style="list-style-type: none"> <li>• Design, implementation and evaluation of the IINSPIRE student experience on each campus, including academic support, social integration, and professional development</li> <li>• Undergraduate research experiences</li> <li>• Design and implementation of undergraduate research certificate programs on campuses</li> <li>• Promotion and adoption of inclusive teaching and evidence-based instructional practices</li> <li>• Innovative math interventions</li> <li>• Promotion of and preparation for industry and research internships as part of the IINSPIRE student experience</li> <li>• Role-model training (students)</li> <li>• Mentor training (peers)</li> </ul> <p><b>Faculty Development (Objective 2)</b></p>	<ul style="list-style-type: none"> <li>• Enrollment and graduation data</li> <li>• Number of activities/events</li> <li>• Number and demographics of participants</li> <li>• Number of STEM students transferring from 2-year to 4-year institutions.</li> <li>• Number of students completing the research certificate.</li> <li>• NSF WebAMP online database</li> <li>• IINSPIRE student database</li> <li>• Alliance annual conference materials</li> <li>• IINSPIRE student recognition (e.g., awards, news articles, social media posts)</li> <li>• Undergraduate research projects and products (e.g., posters)</li> <li>• Number of and interactions with partners</li> <li>• Website and web analytics</li> <li>• Dissemination through presentations and</li> </ul>	<p><b>LSAMP Program/Student Outcomes (Objectives 1, 6)</b></p> <ul style="list-style-type: none"> <li>• Doubling the number of STEM degrees granted to URM students</li> <li>• Increased individual student retention and progression to baccalaureate degrees for URM groups</li> <li>• Successful transfer of URM students from 2-year to 4-year institutions in STEM programs</li> <li>• Increased access to high quality undergraduate research experiences</li> <li>• Successful transition of URM students into STEM graduate programs</li> </ul> <p><b>Other Student Outcomes (Objective 1)</b></p> <ul style="list-style-type: none"> <li>• Increased URM STEM enrollment and retention across the alliance</li> <li>• Increased student success through transition points, including mathematics during the first two years of STEM undergraduate studies</li> <li>• Increased student participation and engagement in the</li> </ul>	<p><b>Overall Impacts</b></p> <ul style="list-style-type: none"> <li>• Outcomes lead to impacts on students, faculty, department culture, institutions, disciplines, and research knowledge base.</li> </ul> <p><b>Broader Impacts (Objective 6)</b></p> <ul style="list-style-type: none"> <li>• Expanding opportunities for URM students in undergraduate and graduate training and preparation for STEM professions</li> <li>• Improved education pathway through the community college into baccalaureate STEM programs</li> <li>• Increased partnerships with community colleges, industry, diversity programs, and researchers to broaden participation of URM students in STEM majors</li> <li>• Development of a</li> </ul>

Resources	Activities	Outputs	Outcomes	Impacts
<p>development and networking</p> <ul style="list-style-type: none"> <li>• Relevant literature, knowledge and evidence base</li> <li>• ISU Digital Repository</li> <li>• Science Education Resource Center at Carleton College (SERC)</li> <li>• Center for Integrating Research, Teaching, and Learning (CIRTL) Network</li> </ul>	<ul style="list-style-type: none"> <li>• Mentor training (faculty)</li> <li>• Faculty/staff professional development related to pedagogy, inclusion and equity</li> </ul> <p><b>Project Management and Communication (Objective 4)</b></p> <ul style="list-style-type: none"> <li>• Meetings of various team members</li> <li>• Coordination and management of the project</li> <li>• Website development and maintenance</li> <li>• Alliance annual conference</li> <li>• NSF annual reporting</li> <li>• Dissemination of effective practices and research findings</li> <li>• Partnering with industry, community and professional organizations, and campus programs to support the IINSPIRE student experience</li> <li>• Recruitment and outreach through pre-college activities</li> <li>• Marketing to prospective students</li> </ul> <p><b>Evaluation and Research (Objectives 3, 5)</b></p> <ul style="list-style-type: none"> <li>• NSF WebAMP data</li> </ul>	<p>publications</p> <ul style="list-style-type: none"> <li>• Data briefs</li> <li>• Reports</li> <li>• Recruiting and outreach marketing materials</li> <li>• Training and professional development resources</li> <li>• Research datasets</li> </ul>	<p>IINSPIRE student experience on each campus</p> <ul style="list-style-type: none"> <li>• 80% of participants in IINSPIRE Student Experience graduating with a STEM degree</li> <li>• Advancement of students' professional, research and math knowledge, skills and abilities</li> <li>• Placement in STEM jobs and graduate programs</li> </ul> <p><b>Research Outcomes (Objectives 3, 6)</b></p> <ul style="list-style-type: none"> <li>• Increased scientific knowledge about the development of science/engineering identity by participants</li> <li>• Increased scientific knowledge about persistence in STEM majors based on SCCT</li> </ul> <p><b>Other Program Outcomes (Objectives 2, 4)</b></p> <ul style="list-style-type: none"> <li>• Improved messaging and marketing to prospective students</li> <li>• Increased student-faculty interaction</li> <li>• Positive, coordinated, and enhanced STEM educational experience for</li> </ul>	<p>diverse workforce in STEM fields</p> <ul style="list-style-type: none"> <li>• Dissemination of effective practices and project results through national networks and communities such as SERC, CIRTL and LSMCE</li> <li>• Capacity building in STEM research to support innovation and economic development</li> <li>• Integration of research and education to improve STEM teaching and learning</li> </ul>

Resources	Activities	Outputs	Outcomes	Impacts
	<p>collection and reporting</p> <ul style="list-style-type: none"> <li>• Meetings with external evaluator</li> <li>• Design and administration of participant and stakeholder surveys and interviews</li> <li>• IRB updates as needed</li> <li>• Management of IINSPIRE student information</li> <li>• Compilation of assessment and evaluation information</li> <li>• Review of project outcomes</li> <li>• Design and administration of research studies</li> </ul> <p><b>Broader Impacts (Objective 6)</b></p> <ul style="list-style-type: none"> <li>• Broadening participation of URM students in STEM disciplines and undergraduate research</li> <li>• Creating pathways for transfer of URM students from 2-year to 4-year institutions in STEM programs</li> <li>• Integration of research and education to improve STEM teaching and learning and URM student success</li> </ul>		<p>students</p> <ul style="list-style-type: none"> <li>• Increased attention to evidence-based practices to support diverse students</li> <li>• Collaborative structures across units within an institution to effectively and efficiently support students</li> <li>• Collaboration among alliance institutions to achieve IINSPIRE outcomes</li> <li>• Collaboration between academic institutions and external partners to achieve program goals</li> </ul> <p><b>Process Outcomes (Objective 5)</b></p> <ul style="list-style-type: none"> <li>• Extent to which proposed activities are completed and achieving project objectives and outcomes</li> <li>• Extent to which contextual factors help and/or hinder progress toward project goals</li> <li>• Extent to which assessment, evaluation, and research results are used as inputs for continuous improvement</li> <li>• Effect of the project on individual and group attitudes/behaviors</li> </ul>	

Evaluation Tasks	Outcomes	Methods
<p>Annual WebAMP Reporting</p> <p>Annual IINSPIRE Student Engagement Survey (piloted in Summer 2015)</p> <p>Interviews/Focus Groups with Direct Participants</p> <p>Institutional evaluations of evidence-based practice and student experience models.</p>	<ul style="list-style-type: none"> <li>• Doubling the number of STEM degrees granted to URM students</li> <li>• Increased individual student retention and progression to baccalaureate degrees for URM groups</li> <li>• Successful transfer of URM students from 2-year to 4-year institutions in STEM programs</li> <li>• Increased access to high quality undergraduate research experiences</li> <li>• Successful transition of URM students into STEM graduate programs</li> <li>• Increased URM STEM enrollment and retention across the alliance</li> <li>• Increased student success through transition points, including mathematics during the first two years of STEM undergraduate studies</li> <li>• Increased student participation and engagement in the IINSPIRE student experience on each campus</li> <li>• 80% of participants in IINSPIRE Student Experience graduating with a STEM degree</li> <li>• Advancement of students’ professional, research and math knowledge, skills and abilities</li> <li>• Placement in STEM jobs and graduate programs</li> <li>• Improved messaging and marketing to prospective students</li> <li>• Increased student-faculty interaction</li> <li>• Positive, coordinated, and enhanced STEM educational experience for students</li> <li>• Increased attention to evidence-based practices to support diverse students</li> <li>• Collaborative structures across units within an institution to effectively and efficiently support students</li> </ul>	<p>Collect, enter, and analyze WebAMP data including enrollment and graduation data, individual STEM progression data from IINSPIRE direct participants (including those that transfer from 2-year to 4-year institutions), activities that support and expand undergraduate research experiences, and tracking of IINSPIRE direct participants to STEM graduate programs.</p> <p>Administer and analyze the IINSPIRE Student Engagement Survey. Provide mid-year report to Alliance Leadership.</p> <p>Collect, transcribe, and analyze interview and focus groups data from IINSPIRE Direct Participants. Provide mid-year report to Alliance Leadership.</p> <p>Each institution will conduct evaluations of their evidence-based practices and student experience models in order to inform practice and connect the student experience models to project outcomes and goals.</p>
<p>Interviews with Stakeholders and Alliance Leaders</p>	<ul style="list-style-type: none"> <li>• Improved messaging and marketing to prospective students</li> <li>• Collaboration among alliance institutions to achieve IINSPIRE outcomes</li> <li>• Collaboration between academic institutions and external partners to achieve program goals</li> </ul>	<p>Collect, transcribe, and analyze interview and focus groups data from project stakeholders and alliance leaders. Include in Annual External Evaluation Report.</p>

<p>Annual Conference Evaluations</p> <p>Annual Reporting</p> <p>Document Analysis</p>		<p>Survey data from the Annual Conference will be collected, analyzed, and shared with Alliance Leadership. Summarizing data/lessons learned will also be gathered and compiled from Alliance Leadership.</p> <p>Gather artifacts of partnerships among alliance institutions and with external partners for Annual Report.</p> <p>Gather artifacts of marketing and messaging across the alliance for Annual Report.</p>
<p>Mid-year Internal Evaluation Report.</p> <p>Annual External Evaluation Report.</p> <p>Annual 2-day Assessment and Evaluation Retreat</p>	<ul style="list-style-type: none"> <li>• Extent to which proposed activities are completed and achieving project objectives and outcomes</li> <li>• Extent to which contextual factors help and/or hinder progress toward project goals</li> <li>• Extent to which assessment, evaluation, and research results are used as inputs for continuous improvement</li> <li>• Effect of the project on individual and group attitudes/behaviors</li> </ul>	<p>Survey and interview/focus group data from summer programming will be analyzed and compiled into a mid-year report for Alliance Leadership.</p> <p>All annual evaluation data will be gathered and compiled into an Annual External Evaluation Report for Alliance Leadership.</p> <p>Institutional teams and alliance leaders will spend two days each spring to review progress, use data to inform future planning, and discuss outcomes and impacts of activities including student success stories.</p>