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Iowa State University

Integrated Recruitment and Retention Objectives







Learning Village --

---- Connected Curriculum

Coordinated Networking ----







Project Goal: An increase in the number of engineering graduates by 120 per year (15%) by 2012.

Project Objectives:

- Learning Village: To enhance the Learning Community (LC) model at lowa State University by improving programming and availability; and to create an LC model that spans DMACC and ISU.
- Connected Curriculum: To redesign the first-year engineering curriculum to enable flexibility and commonality across LCs; and to make selected engineering gateway courses available to DMACC students via distance education.
- Student-Centered Advising: To develop and enhance academic advising and mentoring programs for pre-college, community college, and university students.
- Coordinated Networking: To establish a recruiting and outreach network across lowa and with alumni using ISU Extension and DMACC and involving parents and teachers; to tap into diverse communities of students; and to improve the awareness and understanding of engineering among those who influence student choices.
- Evaluation and Dissemination: To evaluate project effectiveness and improve project activities, and to share best practices on campus in other areas of STEM, with other community colleges in lowa, with other institutions in the Big 12 consortium, and at national meetings.

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STEM Student Enrollment and Engagement through Connections

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Project Organization: A Coordinated Approach

- Project team members are assembled into action-oriented, cross-institutional teams corresponding to each objective of the project, called *O-Teams*.
- Learning Village Team
- Curriculum Team
- Advising Team
- Networking Team
- Evaluation Team
- O-Teams are led by principal investigators and composed of both lowa State University and DMACC faculty and staff.
- O-Teams meet regularly at each institution.
- Some team members belong to more than one O-Team, providing cross-functional interactions.
- Evaluation Team members are involved with each O-Team.

Project Partnerships: A Collaborative Approach

- Iowa State University Colleges: Engineering, Human Sciences, Liberal Arts and Sciences, Agriculture and Life Sciences
- DMACC Campuses: Ankeny, Boone, Carroll, Newton Polytechnic, Urban/Des Moines, West
- DMACC Career Academy/Hunziker Center (Ames)
- Iowa State University Extension
- Iowa State University Research Institute for Studies in Education (RISE)
- Iowa State University Office of Community College Research and Policy
- Iowa State University Student Affairs (Enrollment Services, Learning Communities)
- Iowa State University Program for Women in Science and Engineering
- Iowa Engineering Society
- Iowa Department of Education

Learning Village and Transfer **Advising Progress**

First Year Focus: Development and enhancement of intra- and inter-institutional relationships through the development of the "Learning Village" and an effective transfer advising system Learning Village key accomplishments include

- On-site engineering advising for DMACC students (2–3 hours a week)
- Use of Web-based network for connecting DMACC students with Iowa State advisers/peer mentors
- Class visits by engineering faculty to DMACC pre-engineering classes (>100 students)
- Iowa State University career fair visits by DMACC pre-engineering students (> 60 students)
- Development of a spring-semester service learning project
- Development of an eight-week engineering orientation class taught at DMACC
- Bimonthly SEEC pre-engineering newsletters
- Development of podcast materials for learning more about the engineering profession
- Ultimate Frisbee challenge with integrated lowa State/DMACC teams with an engineering presentation of the engineering behind the flight of a Frisbee
- Transfer advising key accomplishments include
- Developing clear programming, advising, recruitment, and outreach approaches/linkages with Iowa State's Admissions Partnership Program and Cross Enrollment Program
- Developing transfer booklet/Web site that can be posted online for print and/or electronic use
- Connecting community college students with Iowa State's Program for Women in Science and Engineering Girlslink ementoring, WISE and Transfer Learning Communities, Mentornet, and student role model programs
- Exploring and evaluating the use and adaptation of resources and approaches from Dr. Frankie Santos Laanan's NSF Pathway to a STEM Baccalaureate Degree and Dr. Monica Bruning's NSF Female Recruits Explore Engineering Projects





ISU News Service, August 21, 2007 Iowa State and DMACC work together to

increase engineering graduates -- Iowa State University and Des Moines Area

Community College will work together to boost the number of students earning engineering degrees. An enrollment boost would be good for the schools and the country...

"This National Science Foundation program is a tremendous opportunity for Iowa State University. It will help Iowa State meet the national goal of recruiting and retaining new engineering students. And, it will help lowa State reach its goals of strengthening undergraduate education, increasing experiential learning opportunities and partnering with community colleges to facilitate student success."

Elizabeth Hoffman, lowa State's executive vice president and provost

"This is an excellent opportunity. This will enable us to build stronger bonds between the two institutions and help students make smooth transitions between them." Harry McMaken, a professor of engineering and math at Des Moines Area Community College's Ankeny campus and the leader of the research project at the community college

"This will make a bold statement that students who choose not to start at Iowa State from high school can begin a pre-engineering curriculum at Des Moines Area Community College. This really ensures student success, transfer and, ultimately, the completion of an engineering degree."

Frankie Santos Laanan, the co-director of lowa State's Office of Community College Research and Policy and an associate professor of educational leadership and policy studies



Evaluation Plans and Opportunities

Context

Assess baseline data from Fall 2006 College of Engineering student characteristics, admissions pool, previously existing programs, and inter-institutional agreements; examine historical data from lowa State and community colleges to ascertain the basis for detecting changes in trends; establish logic model.

Input

Assess alternative strategies and resource allocation plan; examine work plan; assess extent to which project strategy design, and budget meet the objectives of the project.

Process

Provide formative evaluation guidance for implementing the work plan, and recommend mid-course adjustments to team leaders as appropriate based on continuous updates; offer formative recommendations to enhance the success of interactions within each objective team, among executive team members, and between institutions; cost-effectiveness of project implementation.

Product

Assess changes in numbers and diversity of students in targeted groups recruited, admitted, retained, and graduated; examine student attitudes toward STEM careers; assess attitudes and satisfaction of project administrators and staff; examine positive and negative externalities; assess impact of internal and external advisory groups; examine student persistence within major, within disciplinary area, and within institution from semester to semester; assess impact on persistence and GPA of student participation in learning communities; examine student engagement.

Evaluation Challenges

- Strategize for full-scale evaluation efforts, building on the evaluation plan detailed in the proposal. data, as well as methods and timing for data collection and analysis.
- Identify types of information needed to measure progress toward meeting project objectives, based, for example, on action plans or project activities. Identify sources of • Use the time available under the project to conduct appropriate data collection. This requires clear demarcation of research and evaluation data needs.
- Resolve issues related to data ownership, data analysis, and dissemination of the results.
- Engage team members in using evaluation instruments, such as a Plus/Delta survey, to review and improve project activities.
- Assemble adequate data to provide concrete assessments of project accountability, effectiveness, impact, organizational context, and any unanticipated outcomes.

Networking Opportunities

- Development of recruiting kits and marketing materials
- Statewide 4-H programs
- High school competitions in STEM (robotics, IT, etc.)
- Summer programs in STEM
- Project Lead The Way and other educational programs Mentoring programs
- Iowa Engineering Society and industry partnerships
- Development of scholarship and financial awareness campaigns • Existing engineering and DMACC scholarships
- New scholarships
- Collaboration with ISU Extension to launch the E-TEC program

E-TEC: Engineering Talent in Every County

E-TEC is an initiative aimed at enhancing awareness of engineering careers and pathways and facilitating connections between STEM-related programs, people, and resources.

E-TEC is designed to provide information on careers and opportunities and includes scholarships for future engineering students. It is a partnership between ISU Extension, the College of Engineering, and University Admissions. This initiative will strengthen ISU Extension's ability to connect youth in the counties with Iowa State for engineering information.

- Dissemination of contemporary and relevant engineering career information
- Development of networks and connections

IOWA STATE UNIVERSITY

NSF STEM Talent Expansion Program (STEP)



• Coordinate evaluation efforts across teams and achieve a more holistic overview of the activities of the teams.

• Use the resources available under the project to add members to the evaluation team from lowa State and DMACC to address established needs.





Core Values

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