

SEEC

Student Enrollment and Engagement through Connections

**Year 1 (2007-2008)
Annual Report and
Evaluation Workshop**

4.24.2008

SEEC Workshop Agenda – 4.24.2008

11:00 am - Year 1 Update from PIs and O-Team Leaders

NSF Year 1 Annual Report and Evaluation Activities

11:30 am – Student Numbers and Benchmarks

12:00pm – (Working Lunch) SEEC Outcomes - Year 1

- Group Activity on SEEC Contributions for Annual Report
- Process Evaluation for O-Teams

Planning for Year 2

1:00pm - Planning for Year 2 (3, 4, and 5) with Logic Models

- Logic Model Review (powerpoint)
- O-Team Working Groups – Logic Models (activity planning)
- O-Team Logic Model reports

3:50pm – Wrap up and next steps

Workshop Evaluation link will be emailed to you – Please complete.

Note: Evaluation/Assessments will be added to Logic Models by the Evaluation O-Team for Year 2. This will take place post workshop.

SEEC: STUDENT ENROLLMENT AND ENGAGEMENT THROUGH CONNECTIONS

NSF STEP Grantees Meeting

- March 6-7, 2008
- Poster Session

NSF STEP Grant

STEM Student Enrollment and Engagement through Connections

IOWA STATE UNIVERSITY
College of Engineering

NATIONAL SCIENCE FOUNDATION
STEM Talent Expansion Program (STEP)

DMACC
DES MOINES AREA
COMMUNITY COLLEGE

Principal Investigators
Diane Rover
Harry McManis

Senior Personnel
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Mary Goodwin
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Michael Lantieri
Randy Mead
Ted Miller
Lee Pearey
Sokiah Sands
Kevin Saunders
Randy Smith
Jay Stuber
Vicky Thordson-Oster

Integrated Recruitment and Retention Objectives

- Learning Village
- Connected Curriculum
- Student-Centered Advising
- Coordinated Networking
- Evaluation

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 Iowa State University by improving programing and student ability and to create an LC model that serves DMACC and ISU.
- Coordinated Curriculum To redesign the three engineering curricula to enable flexibility and commonality across LCs and to make additional engineering gateway courses available in DMACC as well as distance education.
- Student-Centered Advising To develop and enhance academic advising and mentoring programs for pre-engineering, incoming, and continuing students.
- Coordinated Networking To establish a networking and career development center and web site using ISU resources and DMACC and involving current and transfer students to provide a networking and career development center for students who influence and influence others.
- Evaluation and Dispersed Data To measure program effectiveness and improve project activities and to share best practices on an ongoing basis within areas of STEM, with other community colleges in Iowa, with other institutions in the Big 12 consortium, and an national network.

Grant No. 0653236, July 2007–July 2012

www.engineering.iastate.edu/seec/

Project Organization: A Coordinated Approach

- Project team members are assembled to deliver content, coordinate educational resources corresponding to each objective of the project, and lead O'Team.
- Learning Village Team
 - Curriculum Team
 - Advising Team
 - Networking Team
 - Retention Team
- O'Team are key project investigators and comprised of both Iowa State University and DMACC faculty and staff.
- O'Team meet regularly to meet objectives.
- O'Team meet face-to-face more than once a year, providing cross-institutional interaction.
- Evaluation Team members are involved with each O'Team.

Project Partnerships: A Collaborative Approach

- Iowa State University College of Engineering, Human Resources, Liberal Arts and Sciences, Agriculture and Life Sciences
- DMACC Community College of Eastern Iowa, Des Moines, Western Iowa State University, Eastern Iowa State University
- Iowa State University Extension
- Iowa State University Research Institute for Education (RIE)
- Iowa State University Office of Community College Research and Policy
- Iowa State University Student Affairs Business Services, Learning Communities
- Iowa State University Program for Women in Business and Engineering
- Iowa Engineering Society
- Iowa Department of Education

Learning Village and Transfer Advising Progress

- First-Year Focus: Development and enhancement of inter- and intra-institutional relationships through student-centered "Learning Village" and an effective transfer advising system
- Learning Village key activities include:
 - Core engineering advising for DMACC students (O'Team is a unit)
 - Use of Web-based resources for connecting DMACC students with Iowa State pre-engineering courses
 - Class notes by engineering faculty in DMACC pre-engineering classes (ISU students)
 - Iowa State University courses for transfer DMACC pre-engineering students (ISU students)
 - Development of an advisory center as a key program
 - Development of an integrated engineering retention data system at DMACC
 - Researching ISU pre-engineering resources
 - Development of problem materials for learning more about the engineering profession
 - O'Team Problem Solving with Integrated Iowa State DMACC means with an engineering profession who engineering education at Iowa State
- Transfer advising key activities include:
 - Establishing a programing, advising, retention, and outreach approach/strategies with Iowa State University Pre-engineering Program and Cross-Business Programs
 - Developing transfer toolkits/links to the transfer process for both advising and retention use
 - Developing transferability college website with Iowa State's Program for Women in Business and Engineering, ISU's Career Center, WISU and Transfer Learning Communities, Missouri, and student role model program
 - Exploring and enhancing the use and adoption of resources and approaches from Dr. Phillip Brown's award-winning program at ISU: Retention Success Program and Dr. Maurice Brinkhoff's NSF Research Experiences for Undergraduate Program

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

AMES, Iowa — Iowa State University and Des Moines Area Community College will work together to increase the number of students earning pre-engineering degrees. In a new three-year effort to qualify for the National Science Foundation's STEP program, the two institutions will coordinate their efforts to increase the number of engineering undergraduates who are ready to enter engineering careers.

"This is an excellent opportunity. This will enable us to build on our existing strengths and help us to become a leader in the field of engineering education," said Dr. Phillip Brown, director of the Center for Engineering Education and Research at Iowa State University.

"This will make it a lot easier for students who are not as well prepared for the high-level rigor of the engineering program at Iowa State as they would be if they had completed a pre-engineering program at DMACC," said Dr. Mary Goodwin, director of the Center for Engineering Education and Research at DMACC.



Evaluation Plans and Opportunities

Contact:
Contact Institute staff from Fall 2008 College of Engineering student achievement, retention, and graduation data from Iowa State and community college to assess the need for designing changes to trends, establish legal model.

Input:
Assess alternative strategies and resources available, monitor each plan across sites to which pre-engineering, design, and design were the objectives of the program.

Process:
Provide iterative evaluation guidance for implementing the work plan, and measurement that tracks adjustments to meet leaders an appropriate based on evidence systems, offer iterative recommendations to enhance the success of retention and with each subsequent year, using iterative team, advisory, and business model, use effectiveness of team in plan execution.

Products:
Assess changes to monitor and diversity of students to targeted groups enrolled, admitted, retained, and graduated retention student outcomes based on STEM career, assess retention and satisfaction of pre-engineering students and staff, retention statistics and explore retention data, assess impact of inter- and intra-institutional efforts, monitor student performance with regard, public disclosure areas, and public institutions that accessible to retention access, impact on performance and O'Team participation in learning experience, retention student engagement.



Evaluation Challenges

- Coordinate evaluation of the services and activities at more than 100 sites of the activities of the services.
- Develop the full-time evaluation effort, building on the evaluation plan described in the proposal.
- Identify types of information needed to measure program level and student outcomes, based, for example, on online plans or project activities. Identify sources of data, as well as methods and timing for data collection and input.
- Use data to monitor and evaluate the program and make adjustments as needed. The response data demonstrates of research and evaluation data needs.
- Use the resources available under the project to add members to the team across sites from Iowa State and DMACC to address established needs.
- Monitor issues related to data ownership, data analysis, and dissemination of the results.
- Engage team members in evaluating curriculum, such as a Pilotable course, to measure and improve project activities.
- Assemble data base data to provide baseline comparison of project activities, effectiveness, impact, organizational metrics, and any other targeted outcomes.

Networking Opportunities

- Broad spectrum of networking and marketing materials
- Summer EIT programs
- High school partnerships in STEM (industry, IT, etc.)
- Summer Institute in STEM
- Project Lead The Way and other educational programs
- Mentoring programs
- Iowa Engineering Society and industry partnerships
- Development of relationship and financial resources network
- Building engineering and DMACC relationships
- Non-traditional
- Collaborates 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 include activities for future engineering students. It is a partnership between ISU Extension, the College of Engineering, and University Advise Center. This initiative will strengthen ISU Extension's ability to connect people in the state across Iowa State for engineering information.

- Iowa State University
- DMACC
- ISU Extension Outreach Centers
- 7% of African-American Population
- 6-10% Latino
- 12-15% Latino

This website is based upon work supported by the National Science Foundation under Grant No. 0653236. Any help lists, but no funding conditions or responsibilities are expressed in this website (the website) and do not necessarily reflect the views of the National Science Foundation.

SEEC Poster

SEEC: STUDENT ENROLLMENT AND ENGAGEMENT THROUGH CONNECTIONS

Integrated Recruitment and Retention Objectives



Learning Village



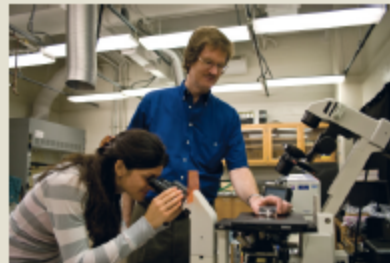
Connected Curriculum

Student-Centered Advising

Coordinated Networking

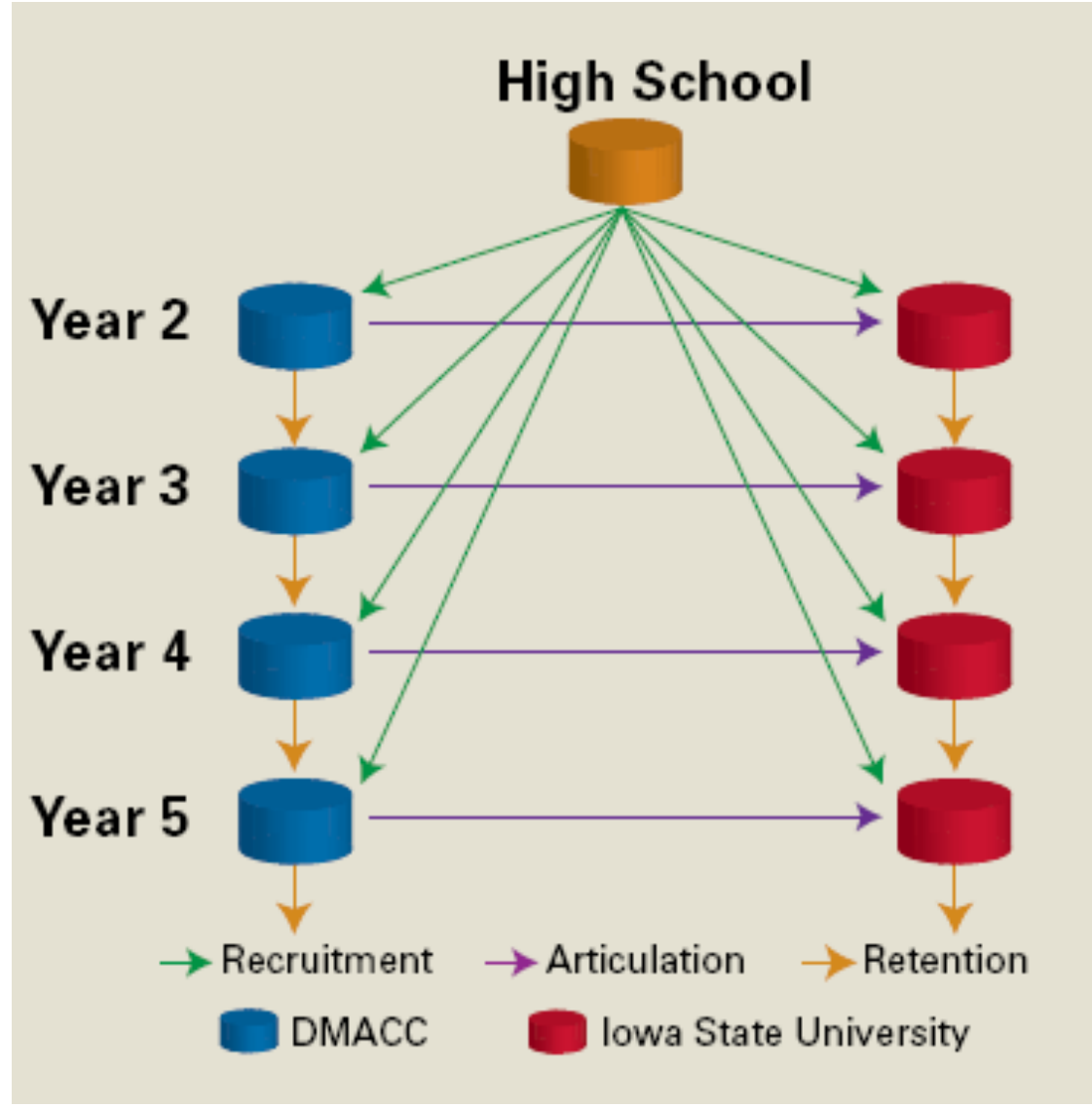


Evaluation



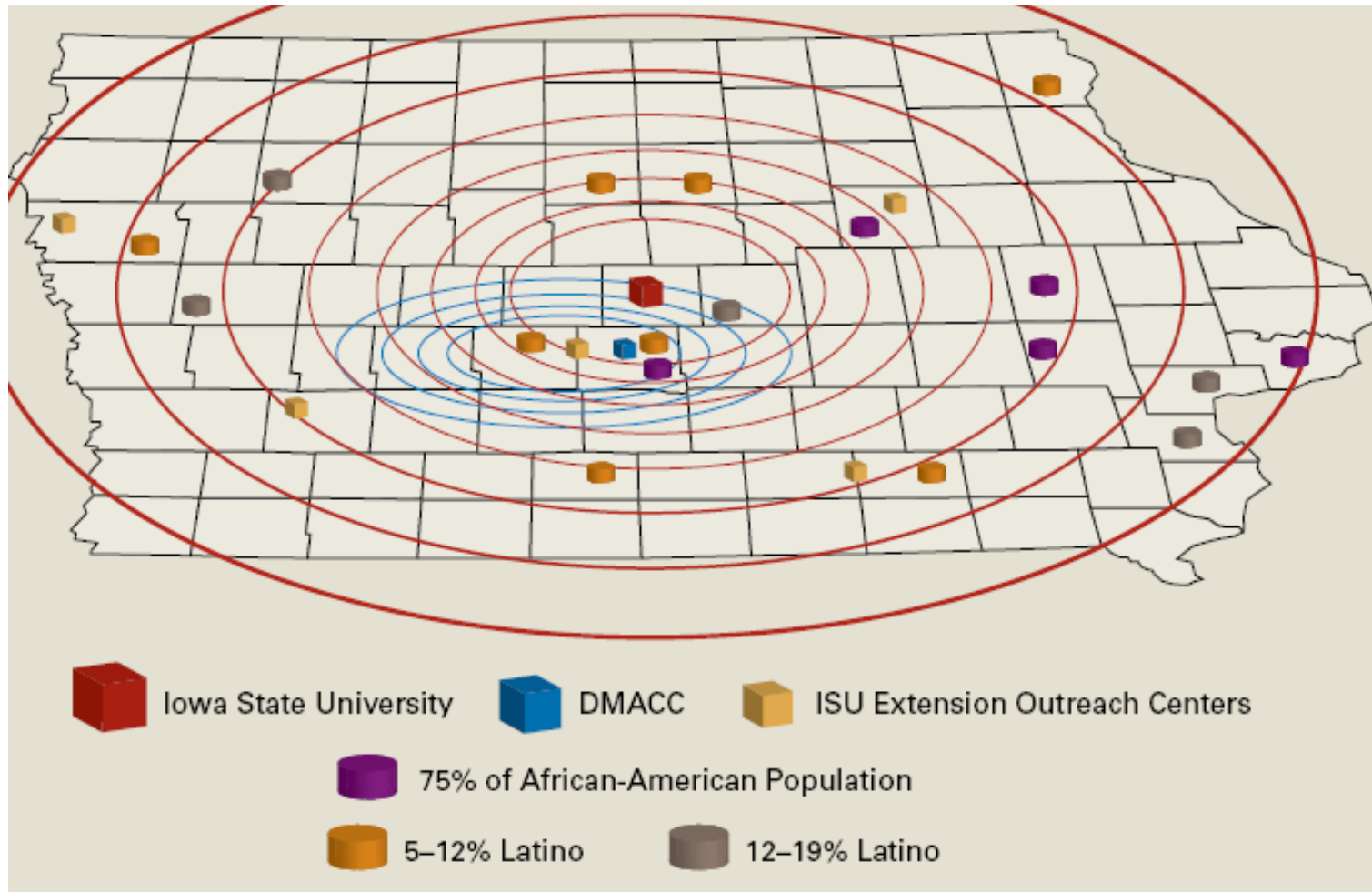
SEEC Poster

SEEC: STUDENT ENROLLMENT AND ENGAGEMENT THROUGH CONNECTIONS

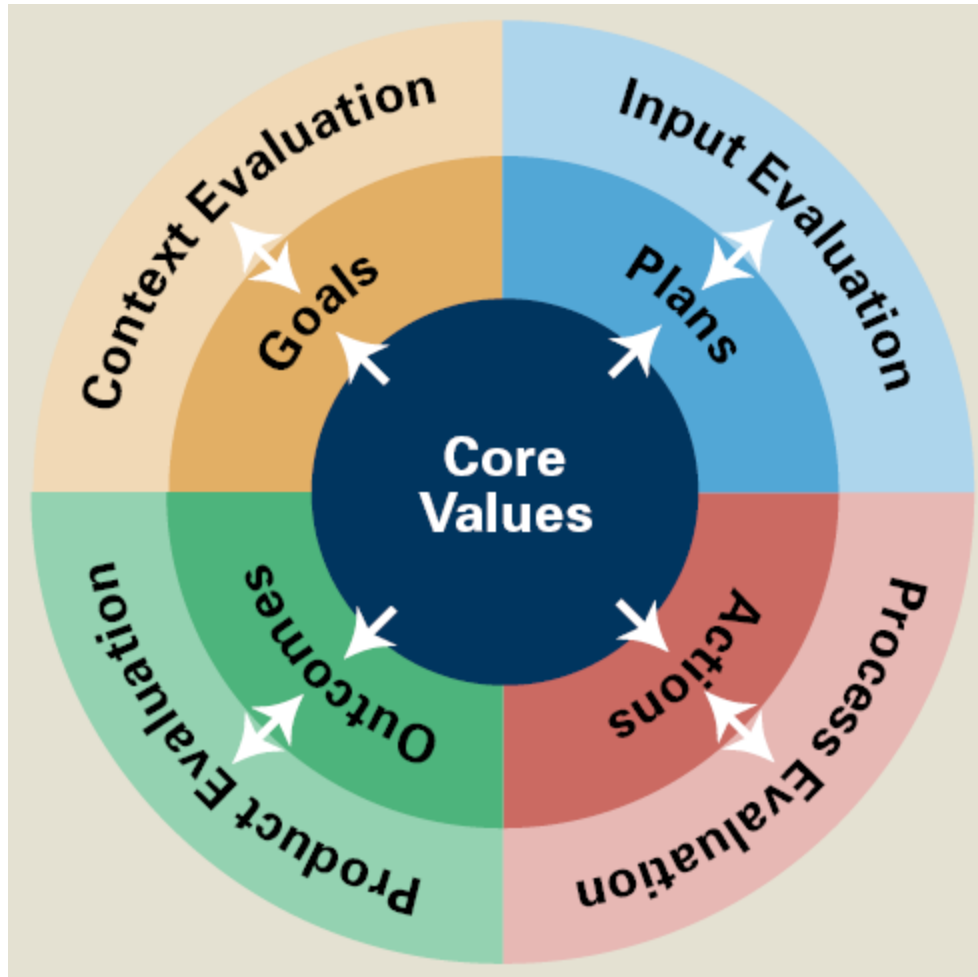


SEEC Poster

SEEC: STUDENT ENROLLMENT AND ENGAGEMENT THROUGH CONNECTIONS



SEEC Poster



SEEC: STUDENT ENROLLMENT AND ENGAGEMENT THROUGH CONNECTIONS

NSF STEP Grantees Meeting

- Breakout Sessions

| | |
|---|---|
| Recruiting Undergraduate Students | Bruning, McMaken |
| Programs for Entering Freshmen | |
| Freshman/Soph Seminars & Learning Communities | Jedele, Mickelson |
| Gateway Courses | McMaken, Rover |
| Mentoring Programs | |
| Internships & Undergraduate Research | Bruning |
| Community College Issues | Darrow, Jedele, Mickelson, Shelley |
| Transfer/Transition from 2-yr to 4-yr Schools | Darrow, Jedele, McMaken, Mickelson, Shelley |
| Effective Project Management | Rover |
| Success of the Overall Program | Shelley |
| Institutional Transformation | Rover |
| Type 2 Roundtable | Bruning, Darrow |

NSF STEP Grantees Meeting

- **What We Learned**

- **Project Management**

- Need for close collaboration between DMACC and ISU, to ensure communication and sharing of data to help the project succeed.
- Most STEP projects underestimate the time and effort needed for project management. NSF is willing to allow reallocations in a budget to improve project effectiveness.

- **Evaluation**

- Evaluation pointers: start early, identify clear measurement goals, define the distribution/frequency (e.g., front-loading, bursts, etc.)
- A clear, thorough evaluation plan is critical to receiving continued funding and avoiding complications at the third-year project review by NSF.
 - Need specific measurable outcomes, quantitative measures of progress on objectives.
 - Project success depends on evaluation.

NSF STEP Grantees Meeting

- **What We Learned (continued)**
 - **Evaluation (continued)**
 - Evaluation requires collaboration, and is a shared responsibility among team members and evaluators.
 - The evaluation structure used by projects varies, including internal evaluators, external evaluators, institutional research offices, and external review committees.
 - NSF is interested in numbers, but...
 - Evaluation is about creating a story, not just reading a meter. Need to interpret results, draw conclusions. Numbers are necessary but not sufficient. It is important to understand the context and effect of interventions.

NSF STEP Grantees Meeting

• What We Learned (continued)

• Activities

- Calculus courses continue to play a critical role in retention, and there are various versions and arrangements being used. Universities are also using aggressive, proactive advising and monitoring of students in calculus.
- There is considerable interest in the Big 12 STEP Conference.
- Need to develop systems that track students between institutions.
- Engineering is a field of study that offers great breadth in career opportunities for graduates; be what you want to be with an engineering degree. Can we market it better to prospective students?
- We are in a good position to propose a parallel STEP Type II project.

• Institutional Change

- Need to change the daily conversation, because the daily conversation supports the myths that define the university culture.
- Need to understand your own environment. Inevitably, one gets “stuck” with change processes, and getting “un-stuck” requires understanding the environment.
- If change involves faculty development, need to find the so-called “bell cows”.

Learning Village O-Team Update

- First Year Focus: development and enhancement of intra and inter-institutional relationships through the development of the “Learning Village.” Learning Village key accomplishments include:
 - on-site engineering advising for over 25 DMACC students (2-3 hours a week)
 - Established web-based network for connecting DMACC students with ISU advisors/peer mentor
 - 3 new residential and 1 academic undeclared Freshmen ISU College of Engineering learning communities added for F08
 - New ISU Material Science and Engineering learning community added for F08.
 - class visits by engineering faculty to DMACC pre-engineering classes (>100 students)
 - ISU career fair visits by DMACC pre-engineering students (> 60 students)
 - development of an eight week engineering orientation class taught at DMACC (n=13)
 - bimonthly SEEC pre-engineering newsletters (five total)
 - Increased Learning Community opportunities within the College of Engineering
 - development of podcast materials for learning more about the engineering profession
 - Ultimate Frisbee challenge with integrated ISU/DMACC teams with an engineering presentation of the engineering behind the flight of a Frisbee

Curriculum O-Team Update

- **The Connected Curriculum Objective: 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.**
 - **Update during Year 1**
 - Emphasize the following attributes of the first-year curriculum: student engagement and success, academic rigor, classroom climate.
 - Evaluate curricular and co-curricular factors that affect 2nd and 3rd year retention.
- **Apply outcomes-based design to first-year engineering courses and identify multiple tracks to achieve outcomes that fit within the learning village.**
 - FY Curriculum Review planned for 08-09.
 - Faculty FY Steering Committee being formed.
 - Review of and support for student success factors in coordination with Advising Team and Engineering College Advising Committee.
 - Participating in new university initiative to enhance rigor in the undergraduate curriculum (Spring 2008 launch).
 - Development and exploration of new FY learning experiences for potential use in LCs, e.g., leadership competencies (Engineering Leadership Program), critical thinking skills.

Curriculum O-Team Update

- **Implement interdisciplinary service-learning projects and undergraduate research projects as part of LC programming for 2nd and 3rd year students.**
 - To be undertaken in coordination with Learning Village Team and Engineering Learning Communities Task Team.
 - FY service-learning project in Engineering Leadership Program provides a starting point (Spring 2007, Spring 2008).
 - Leveraging of new COE program to facilitate undergraduate research: PERUSE, Providing Experiences in Research for Undergraduate Students in Engineering, <http://www.engineering.iastate.edu/peruse.html>
- **Develop and implement the ACCESS program, Academic Courses for Community Colleges in Engineering Study, an engineering distance education program to offer selected gateway courses in engineering to community college students.**
 - Ongoing review of engineering programs of study, transfer guides, and courses on the critical path.
 - Promotion and expansion of ISU-DMACC Cross Enrollment programs.
 - For ISU students: <http://www.public.iastate.edu/~registrar/info/crossnroll.html>
 - For DMACC students: <http://www.dmacc.edu/regISTRATION/cross-enrollment.asp>
 - **Summer 2008: distance offerings of EM 274 (Statics) and EM 374 (Mechanics of Materials)**

Curriculum O-Team Update

- **Classroom climate**
 - CELT 07-08 TEACH grant on “Improving Classroom Climate” to COE Diversity Affairs
 - Originated with ISU P&S Recruitment/Retention grant, in partnership with CELT and PWSE.
 - Series of three workshops for faculty and staff in the COE on “Enhancing the Climate in Engineering”
 - Workshop 1: Increasing Participation, Leadership, and Community
 - Workshop 2: Women’s Perspectives on the Engineering Classroom
 - Workshop 3: Course Planning to Improve Your Classroom Climate
- **Curricular and co-curricular factors that affect 2nd and 3rd year retention**
 - ISU Retention Task Force: studies, tools, etc.

Advising O-Team Update

- Gathered input from various stakeholders regarding advisors/student needs (advising team meetings, individual meetings with community college faculty and staff, meetings with ISU transfer students, and meetings with outreach/extension personnel);
- Developed resources for Admissions Partnership Program (APP) students including a new web-based informational resources;
- Developed eight week engineering orientation class;
- Developing transfer student guide and web-based materials that can be posted online for print and/or electronic use;
- Developing web-based career development site for pre-engineering students and/or students exploring engineering;
- Developing plans for connecting community college students with ISU's Program for Women in Science and Engineering (PWISE) Girlslink e-mentoring, WISE and Transfer Learning Communities, Mentornet, and student role model programs;
- The Pathway to a STEM Baccalaureate Degree Project conducted a site visit with the SEEC Project students, faculty, staff, and administrators in order to include key effective practices and stories into the development of the Laanan Pathway2STEM dissemination products;
- ISU career fair visits for 60+ community college students;
- On-site engineering advising for DMACC students (2-3 hours a week) – 20 students
- Provided advising services for APP students – August 1 – July 31, 2007 – 22 students; August 1 – present, 2008 – 13 students;
- Presentation to all of DMACC advising and counseling staff to disseminate transfer advising materials and literature on the engineering majors; and
- Conducted advising meetings with faculty/staff at 5 community colleges.

Networking O-Team Update

1. Established Network Team and appropriate sub-teams
2. Established sub-teams (E-TEC Initiative; Recruitment; Scholarship) and developed action plans
3. Identifying STEM networks and existing connections
4. Hosted E-TEC Summit and conducted survey to access needs
5. Initiating the development of recruitment kits/marketing materials
6. Exploring and determining scholarship strategies and communicating education finance information

NSF Year 1 (2007-2008) Annual Report and Evaluation

NSF Year 1 Annual Report and Evaluation

- How do we measure the overall goal of the project which is....

“To increase the number of engineering graduates at ISU by 120 per year” (NSF SEEC proposal, p. 2)

- Student numbers and benchmarks
 - ✓ How do we define this?
 - ✓ What numbers do we pull for annual report?
 - ✓ What numbers do we track to be able to demonstrate progress toward our goal.

Baseline Data from Proposal

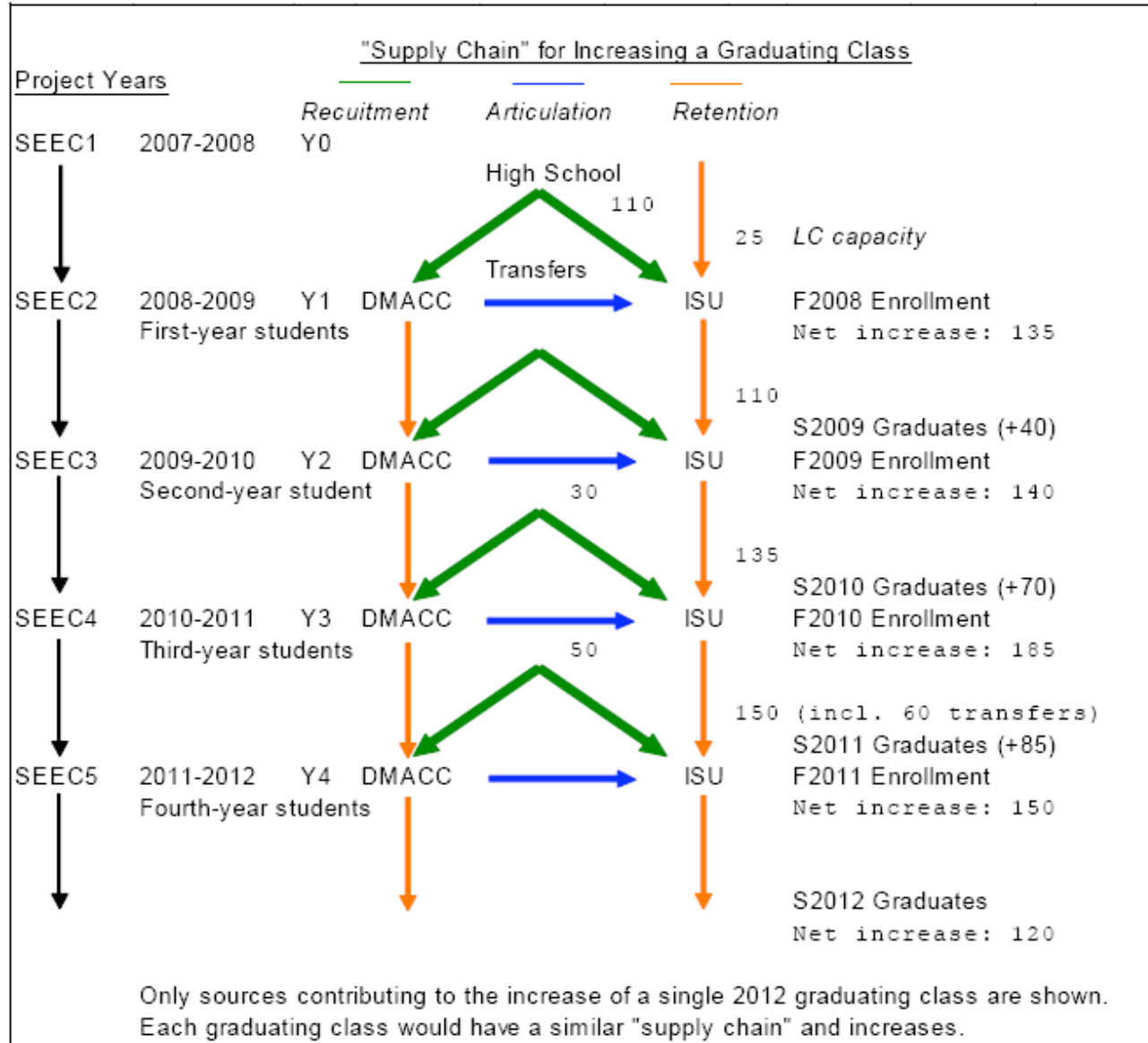
The goal of the SEEC Project is to increase the number of engineering graduates at Iowa State University by 120 per year. As a baseline for the project, we will use an average of the ASEE 2001-2005 degree data, as shown in Table 1. The ASEE 2005 degree data represents a peak, resulting from peak enrollments in 2001 and 2002. The additional graduates represent an increase of about 15% of total engineering degrees awarded at Iowa State compared to the baseline. Enrollment and graduation data are maintained by ISU's Office of Institutional Research.

TABLE 1. Number of B.S. Degrees in Engineering for Iowa State University (ASEE)

| Year | African-American | Asian-American | Hispanic | Native-American | Foreign | Caucasian | Other | Men | Women | Total |
|------|------------------|----------------|----------|-----------------|---------|-----------|-------|-----|-------|-------|
| 2001 | 6 | 28 | 9 | 0 | 93 | 555 | 0 | 574 | 117 | 691 |
| 2002 | 12 | 31 | 11 | 1 | 68 | 594 | 0 | 607 | 110 | 717 |
| 2003 | 9 | 27 | 8 | 1 | 94 | 711 | 0 | 696 | 154 | 850 |
| 2004 | 11 | 23 | 14 | 1 | 89 | 668 | 0 | 662 | 144 | 806 |
| 2005 | 18 | 32 | 24 | 1 | 83 | 672 | 38 | 741 | 127 | 868 |
| Avg. | 11 | 28 | 13 | 1 | 85 | 640 | 8 | 656 | 130 | 786 |

More specifically, the numerical goals of SEEC are as follows:

- Increase in graduates (degrees) per year: 120 (15% increase compared to baseline)
- Total graduates per year: approximately 910
This total would place ISU back in the ASEE top 10 list of schools by degrees awarded. ISU is currently 12th (refer to the table provided as Supplemental). Our goal is to stay in the top 10.
- Increase in diversity of graduates per year: minority graduates by minimum of 10 (20% increase) and women graduates by a minimum of 40 (32% increase)
- Total undergraduate enrollment at the levels of 2001-2002: 4800-4900 undergraduate students



Measuring Student Numbers and Benchmarks

- Who counts? What students?
- What numbers are we pulling (average, cross sectional, and/or trend)? When do we collect?
 - ✓ Average – what years are relevant?
 - ✓ Cross sectional – what slice is nice?
 - ✓ Trend – what year do we start with? and at what point do we measure impact? (e.g., spring 2000 – 10th day count, how does this compare with DMACC's counting procedures)
- Who collects the numbers?
 - ✓ How is this operationalized? Who talks to whom to get numbers?
- How are we tracking student data?
 - ✓ Aggregates or individual level dataset?
 - ✓ Which Demographics? (i.e., variables?)
- What complications might arise and how do we resolve?

NSF Annual Report – Year 1 Outcomes

- **What contributions has the project made?**
 - To the principal discipline
 - Other disciplines in science or engineering
 - The development of human resources
 - The physical, institutional, or information resources that form the infrastructure for research and education
 - Other aspects of public welfare beyond science and engineering, such as commercial technology, the economy, cost-efficient environmental protection, or solutions to social problems?

O-TEAM ACTIVITY

- In O-Team groups brainstorm answers to these questions
- Look at this from 1) an O-Team perspective, and 2) an entire project perspective
- Use the worksheets to record your answers and then transfer to the poster paper

NSF Annual Report O-Team Process Evaluation for Year 1

INDIVIDUAL ACTIVITY

- Please complete the process evaluation questionnaire
- There is an online version of this questionnaire if you prefer to complete online. The url can be forwarded to all of your O-Team members so that everyone can complete an evaluation for year 1.
- [http://www.surveymonkey.com/s.aspx?
sm=YGLEn4m_2by1kjnXc5Yzshg_3d_3d](http://www.surveymonkey.com/s.aspx?sm=YGLEn4m_2by1kjnXc5Yzshg_3d_3d)