**2009**

# Annual Report – Year Two

SEEC: Student Enrollment and Engagement through Connections

**Report Period: 1 July 2008 – 30 June 2009**

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# 0. SEEC Data Update

**The goal of the SEEC Project is to increase the number of engineering graduates at Iowa State University by 122 per year.** More specifically the numeric goals of SEEC are as follows:

- Increase in graduates (degrees) per year: 122 (15% increase compared to baseline)
- Total graduates per year: approximately 930 This total would place ISU back in the ASEE top 10 list of schools by degrees awarded. ISU is currently 12th. Our goal is to stay in the top 10.
- Increase in diversity of graduates per year: increase the number of minority graduates by a minimum of 15 (25% increase) and women graduates by a minimum of 42 (32% increase)

> **The goal of the SEEC Project is to increase the number of engineering graduates at Iowa State University by 122 per year.**

As a graduate baseline number for the project, we used an average of the American Society for Engineering Education (ASEE) 2001-2006 degree data, as shown in Table 0.1 below. The ASEE 2006 degree data represent a peak, resulting from record enrollments in 2001 and 2002. The additional graduates represent an increase of about 15% over the total number of engineering degrees awarded at ISU compared to the baseline.

Table 0.1

*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 |
| 2006 | 33 | 38 | 15 | 4 | 62 | 742 | 38 | 788 | 144 | 932 |
| Avg.* | 15 | 30 | 14 | 1 | 82 | 657 | 13 | 678 | 133 | 811 |
| 2007 | 17 | 34 | 16 | 2 | 31 | 704 | 41 | 716 | 129 | 845 |
| 2008 | 22 | 27 | 22 | 4 | 46 | 683 | 42 | 726 | 120 | 846 |

*Baseline data – average of 2001 to 2006 data

Of the 930 total graduates, we continue to aim for a minimum of 175 women and 75 minority graduates. These represent the following percentages of total graduates.

| | | | |
|---|---|---|---|
| Percentage of women in 2006 graduates: | 15.5% | Minority students in 2006 graduates: | 9.7% |
| Percentage of women in baseline data: | 16.4% | Minority students in baseline data: | 5.7% |
| Percentage of women in SEEC graduates: | 18.8% | Minority students in SEEC graduates: | 8.1% |

More aggressively, we will pursue a target of 90 minority graduates, i.e., the 2006 total, representing both a peak degree production and a minority degree production substantially greater than preceding years.

**Year 2 Data – Where are we at now?**

Simply, to increase ISU engineering graduates, enrollment numbers (new freshmen and transfer students) as well as retention numbers need to increase. Just as the 2001-2002 incoming enrollments led to the 2006 peak graduating class, the 2007-2008 enrollments should lead to the 2012 graduating class, which is the first target class for SEEC. Table 0.2 shows ISU enrollment numbers for these pivotal years.

Table 0.2

*Engineering Fall Enrollment for Iowa State University*

| Fall Enrollment | Fr | So | Jr | Sr | Sp | Total | New Fr | New Tr | New Enrollment (Fr + Tr) |
|---|---|---|---|---|---|---|---|---|---|
| 2001 | 1566 | 920 | 1060 | 1277 | 53 | 4876 | 1264 | 216 | 1523 |
| 2002 | 1371 | 1112 | 952 | 1472 | 56 | 4963 | 1107 | 207 | 1361 |
| 01, 02 Average | 1469 | 1016 | 1006 | 1375 | 55 | 4920 | 1186 | 212 | 1442 |
| 2007 | 1344 | 928 | 939 | 1369 | 20 | 4600 | 1200 | 206 | 1423 |
| 2008 | 1383 | 965 | 989 | 1312 | 27 | 4676 | 1231 | 215 | 1469 |
| 07, 08 Average | 1364 | 947 | 964 | 1341 | 24 | 4638 | 1216 | 211 | 1446 |

The fall 2008 new student enrollment in engineering at ISU is 1469 students. Of these new students, 58.3% are residents and 41.7% non-residents; 14.6% are transfers, and 85.4% new freshmen. For additional background on enrollment data and graduation rates at ISU, see the ISU website under Enrollment Statistics and Fact Book (refer to the Index). One of the SEEC project goals is to increase transfer student enrollment in the engineering. Review of DMACC students enrolled at ISU in fall 2008 showed a total 1242 students compared with 2007 enrollment of 1144. Of those 1242 enrolled, 393 were in STEM majors, including 103 in engineering majors. 130 new transfers from DMACC were admitted in fall 2008 in STEM majors, and of these, 42 in engineering. See table 0.3 below for a more detailed comparison of 2007 and 2008 enrollment numbers.

**130 new transfers from DMACC were admitted in fall 2008 in STEM majors, and of these, 42 in engineering.**

Table 0.3

*DMACC Relevant Enrollment for Iowa State University*

| Year | New Enrollment in Engineering | Total DMACC Students Enrolled at ISU | Former DMACC students in ISU STEM majors | Former DMACC Students in ISU Engineering Majors | New DMACC transfers to ISU STEM majors | DMACC transfers to ISU Engineering majors |
|------|------|------|------|------|------|------|
| 2007 | 1423 | 1144 | 310 | 94 | 97 | 31 |
| 2008 | 1469 | 1242 | 393 | 103 | 130 | 42 |

Further review of 2007-2008 enrollment numbers by ethnic minority and gender can be seen in Table 0.4. The percentages of women in 2007 and 2008 are, respectively, 14.5% and 14.6%. The minority percentages are, respectively, 8.4% and 7.6%.

Table 0.4

*Engineering Enrollment at ISU for Freshmen and Transfer Students by Ethnic Minority and Gender*

| Enrollment | Totals | |
|------------|--------|--------|
| | 2008 | 2007 |
| American Indian/Alaskan Native | 10 | 12 |
| African American | 77 | 101 |
| Asian or Pacific Islander | 154 | 155 |
| Hispanic | 113 | 120 |
| Total Ethnic Minority | 354 | 388 |
| Male | 3995 | 3935 |
| Female | 681 | 665 |
| Total | 4676 | 4600 |

These data reflect the need for continuing emphasis on diversity recruitment and retention activities. Preliminary new enrollment data for Fall 2009 indicate progress in recruitment with estimates of 16% women and 10% minority students.

# 1. Project Background

The STEM Student Enrollment and Engagement through Connections (SEEC) project, pronounced "seek," does what its name implies – seeks students and connections. The goal is to increase the number of engineering graduates at Iowa State University by 122 per year. The means to that end are connections rooted in community:  learning communities, community colleges, and Iowa communities. The project is collaborative between Iowa State University (ISU) and Des Moines Area Community College (DMACC). The cornerstone of SEEC is the success of learning communities for recruitment and retention, and the project builds upon ISU's established learning community infrastructure, leadership, and expertise. Retention at DMACC and ISU will be increased by a new learning community model, called a learning village or meta-community. First-year and gateway engineering courses are being reviewed to engage students more effectively, to provide flexibility, and to support transfer students. Working with DMACC and the STEM Pathway project, student-centered advising is being coordinated to broaden the diversity of students enrolled in engineering and to make students aware of the various paths to successfully completing an engineering degree, including transfer from a community college. Students are being advised on the range of STEM disciplines. Interestingly, in this day and age of high-tech communications, the SEEC project employs a recruiting approach using one of the oldest services of a land-grant institution. With ISU Extension, we are seeking to improve the public awareness and understanding of engineering, especially among students and their parents. The methods of the project will serve ISU and DMACC in several contexts and will be adaptable (scalable and portable) to other institutions.

ISU, chartered in 1858 as Iowa Agricultural College and Model Farm became the nation's first land-grant institution, and was renamed Iowa State University of Science and Technology in 1959. Today, ISU is a broad-based public university of international stature with more than 26,000 students from all 50 states and nearly 120 other nations. ISU, a Carnegie Doctoral/Research-Extensive university, has led the development of several fields of study that are central to the land-grant movement, including engineering, agriculture, family and consumer sciences, statistics, and veterinary medicine. Today, ISU is a recognized leader in many areas of science and technology, including plant and animal genomics, materials sciences, analytical chemistry, behavioral studies, physics, computer science, and many areas of engineering, with new initiatives in food safety and food security, human/computer interaction, combinatorial chemistry, and bioeconomy.

DMACC is a publicly supported two-year institution serving the Des Moines metropolitan area and surrounding counties and enrolling over 16,000 students in credit courses. It is Iowa's largest two-year college. Approximately 25% of the state's population resides within the area served by DMACC's six campuses, including all or major portions of Audubon, Boone, Carroll, Dallas, Guthrie, Jasper, Madison, Marion, Polk, Story, and Warren counties and parts of adjacent counties. College transfer curricula meet the requirements of four-year colleges and universities. In 2005, DMACC began delivering technical education at its new Story County Career Academy – Hunziker Center in Ames, seven minutes from the ISU campus. About 60% of new undergraduate transfer students to ISU are from Iowa area community colleges, of which over one-third are from DMACC.

## 1.1  Project Organization and Goals

There are six main objectives of the SEEC Project:
O1. **Learning Village**. To build a Learning Village that enhances student engagement and creates ISU connections for community college pre-engineering transfer students.

O2. **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.

O3. **Student-centered Advising**. To develop and enhance academic advising and mentoring programs for precollege, community college, and university students.

O4. **Coordinated Networking**. To establish a recruiting and outreach network across Iowa and with alumni using ISU Extension, DMACC, and involving parents and educators; to inspire students from diverse backgrounds to major in engineering among those who influence student choices.

O5. **Evaluation**. To evaluate project effectiveness and improve project activities.

O6. **Dissemination**. To share best practices on campus in other areas of STEM, with other community colleges in Iowa, with other institutions in the Big 12 consortium, and at national meetings.

Each of the objectives O1 – O4 is related to recruitment and retention, and hence to increasing the number of graduates in engineering and other STEM fields. The recruitment and retention methods in the SEEC Project represent a combination of both proven and new approaches. The objectives are tied to recommended practices of effective recruitment, retention, and engagement, including: inclusiveness, engaged faculty, mentoring, peer support, experiential learning, student development, community involvement, relevant curricula, pre-college student/adult relationships, encouragement to consider engineering, and the influence of parents, peers, teachers/counselors, and the media.


## 1.2  Project Strategy

The objectives of the SEEC project are being addressed through a set of recruitment, retention, and engagement activities associated with developing the community, curriculum, advising, and networking components of the project. Both recruitment and retention goals are supported by project components related to objectives O1-O3 (community, curriculum, and advising). Recruitment goals are primarily supported by the networking component of objective O4.

Key project objectives and related activities are identified below. Specific activities conducted toward meeting the project objectives for the year 2008-2009 are discussed in section 4 of this report.

Community (Learning Village)
A1. Build Admissions Partnership Program (APP)-Engineering .
A2. Enhance /expand learning community model at DMACC and ISU.
A3. Develop ISU faculty visits, webinars, video activities.

Curriculum
A1. Apply outcomes-based design to first-year engineering courses and identify multiple tracks to achieve outcomes that fit within the learning village. Emphasize the following attributes of the first-year curriculum: student engagement and success, academic rigor, and classroom climate.
A2. Implement interdisciplinary service-learning projects and undergraduate research projects as part of LC programming for 2nd and 3rd year students. Evaluate curricular and co-curricular factors that affect 2nd and 3rd year retention.

A3. Develop and implement the ACCESS (Academic Courses for Colleges in Engineering Study and Scholarships) program, a new College of Engineering distance education program to offer selected gateway courses in engineering to community college students.

Advising
A1. Develop a data system which informs program development towards pathway of success in engineering.
A2. Provide Professional Development to community college pre-engineering advisors and faculty.
A3. Develop and implement communications and transfer advising materials for CC audiences.
A4. Develop and implement a mentoring and transfer intervention program.

Networking
A1. Collaborate with ISU Extension to implement programs to improve awareness, understanding, and interest in engineering in every county in Iowa. Establish a network to encourage student interest.
A2. Collaborate with ISU Extension, ISU Admissions, and DMACC SEEC team on diversity recruiting across Iowa, seeking to develop cohort groups within clustered counties/schools/service areas and emphasizing engagement/participation of ethnic minority and female populations (i.e., E-TEC Recruitment – Engineering Talent in Every County). Offer scholarships through Extension, DMACC, and existing recruitment networks, in coordination with the College of Engineering scholarship program.
A3. Develop recruiting kits for use by various stakeholders, including Extension, Admissions, and the Alumni Association (PERK, Personal Engineering Recruiting Kit; or PRKS, Personal Recruiting Kit for STEM).

Evaluation
A1. Apply quantitative and qualitative evaluation methods, both formative and summative.
A2. Create and use internal and external advisory groups.

Dissemination
A1. Coordinate activities and share practices with related efforts on the ISU and DMACC campuses. Transition results to other STEM disciplines and community college partnerships.
A2. Create an active network of Big 12 institutions to advance STEM recruiting and retention in the central United States. Organize regional forums on best practices in STEM involving the Big 12, including sharing project outcomes among institutions having NSF STEP grants.
A3. Document and publish project results, and participate in national meetings.

## 2. Project Participants

Table 2.0.1 lists SEEC project participants for 2008-2009, along with their project role, time involvement, and objective team involvement.

The NSF Fastlane Reporting System limits reporting to 25 project participants. Appendix A provides a more detailed list of project participants for year two (2008-2009) and their roles within each of the objective teams.

Table 2.0.1

*SEEC Project Participants, Year Two (2008-2009)\**

| Participant | Institution | Project Role(s) | > 160 Hours | L | C | A | N | E |
|---|---|---|---|---|---|---|---|---|
| Diane Rover | ISU | Principal Investigator | Yes | | LE | | | |
| Harry McMaken~ | DMACC | Principal Investigator | Yes | CO | CO | | | |
| Monica Bruning~ | ISU | Co-Principal Investigator | Yes | | | | LE | |
| Frankie Laanan~ | ISU | Co-Principal Investigator | No | | | LE | | |
| Kim Linduska | DMACC | Co-Principal Investigator | No | | | | | |
| Steve Mickelson~ | ISU | Co-Principal Investigator | Yes | LE | CO | | | |
| Mack Shelley~ | ISU | Co-Principal Investigator | Yes | | | | | LE |
| Mary Darrow~ | ISU | Senior Personnel | Yes | CO | CO | LE | CO | |
| Mary Goodwin~ | ISU | Senior Personnel | Yes | CO | CO | LE | | |
| RM Cooper~ | ISU | Senior Personnel | Yes | | | | | CO |
| Mani Mina~ | ISU | Senior Personnel | No | CO | CO | | | |
| Derrick Rollins | ISU | Senior Personnel | No | | CO | | | |
| Loren Zachary | ISU | Senior Personnel | No | | CO | | | |
| Karen Zunkle~ | ISU | Senior Personnel | No | | CO | | | |
| Jackie Baughman | ISU | Graduate Assistant | YES | CO | | | | |
| Paul Castleberry | ISU | Other – collaborator | No | CO | CO | | | |
| Kevin Saunders | ISU | Other – collaborator | No | CO | CO | | | |
| Randall Jedele | DMACC | Other – collaborator | No | CO | | | | |
| Doug Beck | ISU | Other – collaborator | No | | | CO | CO | |
| Anne Howsare | DMACC | Other – collaborator | No | | | CO | | |
| Ahmed Ageyman | DMACC | Other – collaborator | No | | | CO | | |
| Randy Mead | DMACC | Other – collaborator | No | | | | CO | |
| Michael Lentsch | DMACC | Other – collaborator | No | | | | CO | |
| Jay Staker | ISU | Other – collaborator | No | | | | CO | |
| Carol Heaverlo | ISU | Other – collaborator | No | | | | CO | |
| Lora-Leigh Crystal | ISU | Other – collaborator | No | CO | | | | |

*Maximum of 25 participants are allowed to be entered into NSF Fastlane System
~Received grant funds
Note: L=Learning Village, C=Curriculum, A=Advising, N=Networking, E=Evaluation; LE=Leader, CO=Contributor/Collaborator

## 2.1 Partnering Organizations

Currently, DMACC is the only external organization partnering and participating in the SEEC grant with ISU.

## 2.2 Additional Collaborators

The SEEC project collaborates with a number of ISU internal organizations and departments outside of the College of Engineering as well as a few industry partners. They are:

- E-SET (ISU Extension)
- Iowa 4-H Clubs
- Office of Admissions
- Office of Community College Research and Policy (OCCRP)
- Office of Financial Aid
- Office of the Registrar
- Program for Women in Science and Engineering (PWSE)
- Research Institute for Studies in Education (RISE)
- John Deere Company – Ankeny, Iowa (DMACC EGR 100 class)
- Sauer-Danfoss - Ames, Iowa (DMACC EGR 100 class)
- ZLR IGNITION - Des Moines, IA (Marketing, collaborating on a new recruiting campaign)
- ISU Engineering Communications (Eric Dieterle, Director)
- ISU University Marketing (Carole Custer, Director)

# 3. Activities and Findings

In year two (2008-2009) of the SEEC project, the leadership team and objective teams participated in a number of activities designed to help meet the SEEC project goals.

## 3.1 Activities for Year Two

### Leadership Team
The following action items took place in year two toward supporting the goals of the SEEC project.

➢ *Action.* The leadership team comprised of Diane Rover (PI), Monica Bruning (co-PI), Frankie Santos Laanan (co-PI), Steve Mickelson (co-PI), Mack Shelley (co-PI), Mary Darrow (senior personnel), RM Cooper (senior personnel), and Gloria Hill (support) continued to meet on a bi-weekly basis to discuss project activities and goals. In year two, additional members were added to the leadership team. They are: Mary Goodwin (senior personnel), Sandy Jennings-Hammond (communications specialist), and Lindsey Long (Diversity Affairs Coordinator).

➢ *Action.* Mary Darrow (Program Manager) was hired to manage the project, oversee and manage crosscutting issues between objective teams, and provide internal and external leadership for project implementation.

➢ *Action.* A communication specialist (Sandy Jennings-Hammond) was hired to help direct and facilitate dissemination of grant specific information and to provide links between all grant stakeholders and special interest groups. Specific activities related to dissemination activities for year 2 of the SEEC grant can be found under the Dissemination Objective Team heading in the section below.

➢ *Action.* The leadership team developed and implemented logic model plans for each of their respective objective teams. Logic model planning continues to drive implementation for this project.

➢ *Action.* Individual Objectives Teams continue to meet and are engaged in project implementation guided by logic model plans.

➢ *Action.* The Leadership Team was engaged in reviewing and providing input into the efforts to create a new "branding" for the college following research-based approaches intending to "change the conversations" about engineering to young people.

➢ *Action.* The leadership team (including DMACC) has engaged in several conversation guided by our evaluation team to define individual and joint data sets for tracking transfer students between (and among) institutions.

➢ *Action.* The project website was expanded and additional information was added: www.eng.iastate.edu/seec/

➢ *Action.* Conducted two all-day meetings for the project: one in the fall, as a retreat to plan and organize grant activities for year two with full teams from both ISU and DMACC participating; and one in the spring, a professional development workshop on transfer students participants were from DMACC and ISU. Agendas for both workshops can be found in Appendix B of this report.

➢ *Action.* Participated in the 2009 NSF STEP Grantees Meeting. Seven members of the ISU team and five members of the DMACC team participated in the meeting. SEEC team members served as discussants for Breakout Session 1, *Effectively Managing Your Project – early Years.* Those attending the meeting were:

| ISU | DMACC |
|---|---|
| Diane Rover | Harry McMaken |
| Mary Goodwin | Joe DeHart |
| Mary Darrow | Randy Smith |
| Steve Mickelson | Michael Lentsch |
| Monica Bruning | Ahmed Ageyman |
| Frankie Santos Laanan | |
| Mack Shelley | |

➢ *Action.* Mary Darrow, Diane Rover, and other members of the leadership team developed a workshop for the 2009 ASEE conference in Austin, Texas. The goal of the workshop titled "**Engineering Recruitment and Retention STEP Workshop"** was to bring members of the Big 12 schools together to discuss and share best practices and challenges with their NSF grants with other institutions. A copy of the workshop abstract, agenda, and a list of participants can be found in Appendix C of this report.

➢ *Action.* The SEEC project has gained some visibility on campus resulting in opportunities for collaboration on new proposals and initiatives. SEEC co-PIs continue to be involved with organizers of a proposal for NSF's Innovation for Institutional Integration (I3) program. Also, SEEC team members are involved with organizers of a proposal for NSF's Math and Science Partnership (MSP) program. In such activities, the SEEC project is recognized for

recruiting into STEM and increasing/broadening participation in STEM, thus playing a key role in the spectrum of STEM-pipeline related efforts.

➢ *Action.* Several of the leadership team members serve on university-wide committees that have direct and indirect relationships with the SEEC project. Below is a list of the various committees and who serves on them.

| Name | Committee | Committee Function | Managed by: |
|---|---|---|---|
| **Mary Goodwin** | APP Task Force | Works with APP issues | Admissions |
| | Articulation Coordination Committee | Transfer issues | Provost's Office |
| | University Orientation Committee | Transfer student orientation | New Student Programs |
| | Registration & Classification Committee | Student service issues facing students, academic probation, etc. | Registrar's Office |
| | Course Availability Committee | Makes sure there are enough courses for transfer students | Provost's Office |
| **Steve Mickelson** | Undergraduate Programs Council | Deal with UG Academic & Student Affairs Issues | Provost's Office |
| | Academic Tactical Team | Planning committee for coordinating UG issues | Provost's Office |
| | Learning Community Advising Committee | Key LC committee for planning ISU LC programming | Learning Communities |
| | Civic Engagement Planning Committee | Planning committee for introducing civic engagement and service learning at ISU | Provost's Office |
| | University Retention Task Force | Determine Best Practices for Retention of Students | Provost's Office |
| | Learning Communities Assessment Subcommittee | LC committee for overseeing assessment of current LCs at ISU | Learning Communities |
| **Diane Rover** | University Retention Task Force | Determine Best Practices for Retention of Students | Provost's Office |
| | Undergraduate Programs Council | Deal with UG Academic & Student Affairs Issues | Provost's Office |
| **Mack Shelley** | Learning Communities Assessment Subcommittee | | Learning Communities |

In the remainder of this section, action items that took place specific to each of the Objective Teams' goals and activities are highlighted.

## Learning Village Objective Team

The overall objective is to enhance the Learning Community (LC) model at ISU by improving programming and availability; and to create a LC model that spans DMACC and ISU.

**Activity 1.** Build Admissions Partnership Program (APP) Engineering Foundation.

➤ *Action.* Developed and launched Engineering-Admissions Partnership Program (E-APP) with Admissions and College of Engineering.

➤ *Action.* Developed and distributed Engineering Admissions Partnership Program (E-APP) materials and brochures and posters were to all 5 DMACC campuses and 5 additional community colleges.

➤ *Action.* Provided advising services for 80 APP students through spring 2009.

➤ *Action.* Webcams were purchased and installed on ISU and DMACC advisors' computers to allow for video conference call advising sessions using Skype software.

➤ *Action.* Developed, launched, and successfully transitioned DMACC EGR 100, Engineering Orientation course, from ISU- led to DMACC–led.

➤ *Action.* Continue building a SEEC peer mentor program with 3 peer mentors hired each semester.

➤ *Action.* Developed and launched Facebook social networking site for pre-engineering transfer students. See Appendix D for a screen shot of the Facebook page.

➤ *Action.* Partnered with Admissions and College of Engineering in Transfer Day Events/Activities.

➤ *Action.* Partnered with Advising Objective Team for Career Fair Events/Activities.

➤ *Action.* Partnered with Industrial and Manufacturing Systems Engineering (IMSE) peer mentor program to develop and launch first pre-engineering transfer ISU VEISHA event.

➤ *Action.* Provided support and guest speakers for DMACC-led EGR 100 course in Spring 2009 semester. This course was ISU-led at DMACC in Fall 2008 semester.

➤ *Action.* Developed and provided DMACC EGR 100 students with Transfer Planning form, TRANSIT (an online course transfer credit program which determines if community college courses fulfill degree requirements for a selected ISU Engineering program), and Career development activities.

➤ *Action.* Partnered with Evaluation O-Team to develop questions and conduct focus groups for DMACC EGR 100 course students.

➤ *Action.* Partnered with Evaluation O-Team to develop questions and conduct a focus group for the SEEC Peer Mentor program.

➤ *Action.* Partnered with Advising and Evaluation O-Teams to develop and launch a pre/post ISU engineering transfer student survey to gain insight into the experiences of students coming into the ISU engineering program.

- ➢ *Action.* Begin development of database of potential and current pre-engineering transfer students for peer mentor contact via email, phone, SKYPE, and event invitations.

- ➢ *Action.* One additional learning community added to the ISU College of Engineering core of learning communities. Participation in the College of Engineering learning communities has risen since the fall of 2007 from 79.8% to 84.8%.

**Activity 2.** Enhance and expand the Learning Community (LC) model at DMACC and ISU. . The following action items supporting this activity guideline took place in year two:

- ➢ Action. A comprehensive review of the courses that comprised the Pre-Engineering Program at DMACC was implemented. Based on this review gateway courses were linked to create learning communities. The first courses linked were Calculus II (MAT 217) and Physics II (PHY 223) (spring 09) to be followed by Calculus I (MAT 211) and Physics I (PHY 213)  (fall 09), and Engineering Graphics (EGR 166) and Composition II (ENG 106) (spring 10). Retention data will be analyzed as well as pre and post surveys to evaluate the effectiveness of these learning communities.

- ➢ *Action.* New learning communities for all transfer students are being developed this year.

- ➢ *Action.* New departmental transfer learning communities are being created in the electrical and computer engineering department and the industrial engineering department.

- ➢ *Action.* There will also be a new learning community for all undeclared engineering transfer students which will be available to all incoming transfer students.

- ➢ *Action.* New transfer orientation classes are being developed for electrical, computer, software, and undeclared engineering students and they also will be opened to all transfer students.

- ➢ *Action.*  Coordinated and developed DMACC's first pre-engineering Learning Community.

**Activity 3.** Develop ISU Faculty visits, webinars, and video activities. The following action items supporting this activity guideline took place in year two:

- ➢ *Action.* Partnered with Advising Objective Team for scheduled ISU Advising visits to DMACC – Ankeny campus.

- ➢ *Action.* Provided DMACC EGR 100 students the opportunity to interact with ISU faculty, staff, and students during each semester of the course.

**Activity 4.** Administration of Learning Village O-Team. The following action items supporting this activity guideline took place in year two:

- ➢ *Action.* Developed and established monthly LV O-Team meetings to communicate and review team's activities and progress.

- ➢ *Action.* Developed and built Logic Model plans for monthly review of team's activities/plans, and to help guide assessment measure.

- ➢ *Action.* Coordinated and shared all team materials and information on Team SharePoint (Intranet) site.

- ➢ *Action.* Coordinated with DMACC team members to develop and establish DMACC Objective Teams.

- ➢ *Action.* Updated course curriculum outlines and course equivalency guides for each ISU Engineering degree program.

## Curriculum Objective Team
To redesign the first-year (FY) engineering curriculum to enable flexibility and commonality across the LCs; and to make selected engineering gateway courses available to DMACC students via distance education.

**Activity 1.** Apply outcomes-based design to first-year engineering courses and identify multiple tracks to achieve outcomes that fit within the Learning Village. Emphasize the following attributes of the first-year curriculum: student engagement and success, academic rigor, and classroom climate. The following action items supporting this activity guideline took place in year two:

- ➢ *Action.* A First Year Steering Committee was formed: Diane Rover, Associate Dean and Professor of ECE; Larry Genalo, University Professor of MSE; Tom Brumm, Assessment Director and Assoc. Professor of ABE; Joel Johnson, Director of Student Programs and Services; Roger Bentley, Manager of Student and Alumni Career Services; and Ana Williams, chemical engineering undergraduate student and E2020 peer mentor. The Steering Committee is compiling a set of FY outcomes, which will be used by a college-wide Review Committee during 09-10 to develop a comprehensive vision of the first-year-plus for all engineering students. The college has compiled a list of current programs for first-year students, including orientation and transition programs.

- ➢ *Action.* Institutional Research has provided the 2008-09 NSSE (National Survey of Student Engagement) results for engineering students, which will be used as part of the review.

- ➢ *Action.* Student success factors related to curriculum continued to be monitored in coordination with the Advising Team and the Engineering College Advising Committee.  In addition, university retention initiatives, such as use of MAP-Works (http://www.map-works.com/), are being adopted for engineering students through learning communities and first-year programming. Engineering-specific access is planned to start 09-10. This complements well-established early-intervention activities in the college.

- ➢ *Action.* Members of the SEEC project team from the office of Engineering Diversity Affairs have expanded a summer bridge program called SPEED, Summer Program for Enhancing Engineering Development. This is the second year for SPEED. Although not financially supported by the SEEC project, SPEED is a related activity that promotes the goals of SEEC. The eight-week program is designed to provide women and multicultural students the opportunity to participate in either an academic program or a research program prior to

their first semester at Iowa State. The academic track prepares the students to begin their first year taking advanced-level math and physics courses instead of prerequisite courses. They also develop stronger study habits and create a support network of peers, faculty, and staff. Students in the research track are paired with a mentor and gain hands-on experience working on active research projects. Twenty-five students are participating during Summer 2009.

➤ *Action.* In July 2008, the College of Engineering was awarded an NSF S-STEM grant. Although the majority of the grant is for scholarships, the programming complements the curriculum goals of the SEEC project. In particular, first-year courses and learning communities will incorporate introductory learning modules emphasizing selected outcomes from the NAE's vision for the engineer of 2020. These include student professional development in the areas of leadership, interdisciplinary and systems thinking, innovation and entrepreneurship, and global awareness. Faculty leaders have been selected for each outcome area: leadership, Krishna Athreya, MSE and the Engineering Leadership Program; systems thinking, Chris Rehmann, CCEE; innovation, Doug Jacobson, ECE and IT-Adventures; and global awareness, Amy Kaleita, ABE. This faculty leadership group will be actively involved in SEEC-related curriculum activities in the upcoming year.
  - At the 2008 ASEE/IEEE Frontiers in Education Conference, the PI attended presentations related to first-year curriculum and these areas, for example:
    - A First-Year Introduction-to-Engineering Course on Society's Engineering Grand Challenges (Azarin et al.)
    - Preparing the Engineers of 2020 - Emerging Evidence from Six Exemplary Colleges and Universities (Terenzini et al.)
    - How Do We Teach and Measure Systems Thinking? (Vanasupa et al.)
    - Attaining and Measuring Global Competency For Engineering Graduates (Widmann and Vanasupa)
    - Increasing Awareness of Issues of Poverty, Environmental Degradation and War within the Engineering Classroom: A Course Modules Approach (Catalano et al.)
    - Prepare Locally to Engineer Globally: Embedding a Global Citizenship Foundation into Engineering Curricula (Karlin et al.)

➤ *Action.* At the College of Engineering Learning Community Retreat, May 2009, a panel discussion focused on the connections between Engineering and the College of Liberal Arts and Sciences to foster increased interaction between LAS faculty and COE LCs, especially faculty in the larger service disciplines (Math, Chemistry and Physics). Discussion included making faculty aware of specific COE LCs that are in their large lecture courses; sharing with faculty what a COE LC is and what role it plays within the structure of academics at ISU; and making engineering problem sets available to Math, Chemistry and Physics faculty to use in their own courses.

➤ *Action.* New courses have been identified to allow students to remain at DMACC for a full two years before transferring to a four-year institution and still be able to finish in four years. The first new course to be added is Engineering Strength and Materials to be offered in spring 2010.

➢ *Action.* Through cross enrollment, at risk students at ISU will be encouraged to take certain gateway courses at DMACC (Calc I and II, Physics I and II) as well as other large lecture section courses to better meet the needs of these students.

**Activity 2.** Implement interdisciplinary service-learning projects and undergraduate research projects as part of LC programming for 2nd and 3rd year students. Evaluate curricular and co-curricular factors that affect 2nd and 3rd year retention. The following action items supporting this activity guideline took place in year two:

➢ *Action.* This is a collaborative activity <u>in coordination with the Learning Village Team</u> and the Engineering Learning Communities Task Team.

➢ *Action.* The Engineering Leadership Program is a learning community that includes a service-learning project during the second semester of the first year (http://www.eng.iastate.edu/leadership/serviceprojects.asp). The new E2020 Learning Community, part of the NSF S-STEM grant, will facilitate project-based learning experiences during the student's second year and beyond. These serve as examples.

➢ *Action.* There has been increasing student interest and participation in service-learning projects in engineering.
   • Service learning projects are often co-curricular or extracurricular, sometimes through student organizations such as Engineers for a Sustainable World and Engineers Without Borders, both of which have active student chapters on campus.
   • A new faculty appointment, the director of service learning in engineering, is being defined to provide leadership in the college.
   • During the past year, ISU applied for and received an elective classification for Community Engagement through the Carnegie Foundation. This designation facilitates broader curricular engagement and partnerships needed for sustainable community outreach. Engagement can be pursued in a variety of ways, including coordinated service learning applications. The College of Engineering is actively involved with the university in supporting this designation.

➢ *Action.* Undergraduate research opportunities continue to be a targeted growth area in the college.
   • The PERUSE Program (Providing Experiences in Research for Undergraduate Students in Engineering ), managed by Engineering Graduate Programs, is in its second year of promoting and facilitating undergraduate research for current students.
   • The NSF-sponsored BioMaP REU program (http://www.eng.iastate.edu/biomapreu/) is now open to community college students interested in transferring to ISU. During Summer 2009, the SEEC project sponsored one transfer student for BioMaP.

**Activity 3.** 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. The following action items supporting this activity guideline took place in year one:

- ➤ *Action.* For each community college partner, there has been ongoing review of engineering programs of study, transfer guides, and courses on the critical path.
  - During the past year, the Department of Industrial and Manufacturing Systems Engineering has developed a "2+2" version of the Industrial Engineering program so that students can take two years of coursework at a community college followed by two years at ISU.

- ➤ *Action.* The college participated in the development of the TRANSIT website, https://transit.iastate.edu/, a convenient tool for community college students to explore how coursework will satisfy ISU degree requirements.

- ➤ *Action.* ISU-DMACC Cross Enrollment programs are available to students.
  - For ISU students: http://www.public.iastate.edu/~registrar/info/crossnroll.html
  - For DMACC students: http://www.dmacc.edu/registration/cross-enrollment.asp

- ➤ *Action.* In Summer 2009, the following second- and third-year undergraduate courses were offered online:
  - CE 326 Principles of Environmental Engineering
  - EE 311 Electromagnetic Fields and Waves
  - EM 274 Statics of Engineering
  - EM 324 Mechanics of Materials
  - EM 345 Dynamics
  - IE 305 Engineering Economic Analysis
  - ME 231 Engineering Thermodynamics I
  - ME 325 Machine Design

**Synergistic Activities with Curriculum Development.**

- ➤ *Action.* Another curriculum activity relevant to the SEEC project is the proposed development of an engineering technology program by the Department of Electrical and Computer Engineering. The program is being designed in collaboration with community colleges to provide increased opportunities for transfer students to pursue STEM careers.

- ➤ *Action.* At ISU, the bioengineering minor began this year. SEEC lead PI Rover, as Associate Dean of the College of Engineering, helped initiate it administratively, and it is now directed and supervised by faculty in that area. Information about this minor can be found at: http://www.eng.iastate.edu/bioengineering/. The article in the Spring 2009 issue of Innovate (p. 12), http://www.engineering.iastate.edu/fileadmin/www.eng.iastate.edu/Innovate/innovate_sp09.pdf, states that a goal of the minor is to expand study and career opportunities for students and also attract women students into engineering. The minor is an attempt to use curriculum to complement the Networking objectives and change the perception of engineering.

**Advising Objective Team**
Student-centered Advising - to develop and enhance academic advising and mentoring programs for pre-college, community college, and university students.

**Activity 1.** Develop a data system which informs program development towards pathway of success in engineering. The following action items supporting this activity guideline took place in year two:

➢ *Action.* The SEEC Advising O-Team developed an Engineering Transfer Student Data Brief for dissemination for the purpose of informing transfer student programming. http://www.eng.iastate.edu/seec/reports/SEEC_Transfer_Profile.pdf

➢ *Action.* Training ISU's engineering advisors about transfer students; understanding the factors that affect the academic and social integration of community college students has helped the departments and the college as a whole, improve their student services and academic advising for these students.

➢ *Action.* Data analysis on transfer students' academic performance was disseminated to help inform the advisors when they meet with transfer students for curriculum planning. In-depth analysis of academic data and ongoing review of students' performance was incorporated in advising meetings and the annual May training workshop.

**Activity 2.** Provide Professional Development to community college pre-engineering and ISU advisors and faculty.   The following action items supporting this activity guideline took place in year two:

➢ *Action.* Developed and implemented joint DMACC/ISU student services SEECing Connections workshop for faculty and staff. http://www.eng.iastate.edu/seec/prodevelopment.shtml

➢ *Action.* SEEC Advising O-Team members visited several community college campuses and gave presentations in engineering orientation classes and to high school students interested in engineering at Eastern Iowa Community College, Kirkwood Community College, North Iowa Area Community College, Iowa Valley Community College, and Des Moines Area Community College.

➢ *Action.* Presentation to all of DMACC advising and counseling staff to disseminate transfer advising materials and literature on the engineering majors.

➢ *Action.* Sharing transfer and advising information with the community colleges is ongoing. The university's admission staff hosted a visit for all community college academic advisors from across the state. SEEC Advising O-Team members gave presentations to these advisors to share information regarding our programs.

➢ *Action.* Transfer plans that have been in place for years are continuously being reviewed and updated, along with the transfer website through the SEEC project.

➢ *Action.* Additional training focused on diversity issues. The workshop topics covered understanding diversity, understanding differences in communication styles, understanding cultural differences, and understanding bias and how it impacts our students, the

intercultural classroom, and creating a departmental culture that embraces diversity, i.e., creating an inclusive environment.

**Activity 3.** Develop and implement communications, transfer advising materials, and new programs  for CC audiences. The following action items supporting this activity guideline took place in year two:

➢ *Action.* The registration process was modified to allow DMACC to more easily identify potential engineering students. The result was that more students are receiving advising. Students are being placed in the correct courses in proper sequence. Additionally, students are being placed in EGR 100 – Engineering Orientation within their first year to help them understand both the requirements for becoming an engineer as well as the breadth of the discipline of engineering.

➢ *Action.* Industrial engineering has developed their "2+2" program (2 years at the community college + 2 years at ISU) this year

➢ *Action.* A proposal to implement an ABET accredited "Engineering Technology" program is working its way through the system. The "Engineering Technology" program will consist of the following degree offerings: Computer Engineering Technology, Electrical/Electronics Engineering, and Technology Information Engineering Technology. The primary focus for this program would be for students who are not interested in a 4-year electrical, computer, or software engineering degree. The EE/Cpr E department is working closely with industry and the community colleges to develop the program.

➢ *Action.* The Pathway to a STEM Baccalaureate Degree Project conducted interviews of 15 ISU STEM females in order to include key effective practices and stories into the development of the Laanan Pathway2STEM dissemination products.

➢ *Action.* Materials continue to be developed through Laanan's The Pathway2STEM Baccalaureate Degree Project intended to inform and assist students, faculty, and staff in the STEM community college transfer process.

**Activity 4.** Develop and implement a mentoring and transfer intervention program. The following action items supporting this activity guideline took place in year two:

➢ *Action.* Developed and implemented SEEC Peer Mentor Program.

➢ *Action.* Continued developing plans for connecting community college students with ISU's Program for Women in Science (PWSE), Girlslink e-mentoring, WISE and Transfer Learning communities, Mentornet, and student role model programs.

**<u>Networking Objective Team</u>**
To establish a recruiting and outreach network across Iowa and with alumni using ISU Extension, DMACC, and involving parents and educators; to inspire students from diverse backgrounds to major in engineering among those who influence student choices.

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**Activity 1.** Identify and execute recruitment strategies targeting academically-able or promising Math or Science high school populations. Focus on programs or strategies that are currently deemed promising, but under-developed. The following action items supporting this activity took place in year two:

➢ *Action.* Developed and implemented ETEC scholarship program (www.engineering.iastate.edu/etec). One of the goals of ETEC is to create greater awareness about engineering among girls and underrepresented groups throughout the state so as to increase the representation of these groups in the ISU COE new enrollment numbers. This emphasis on diversity is a direct link with one of the major SEEC project goals --to increase enrollment for women and underrepresented groups. Development of the ETEC scholarship program included a description of scholarship, determining selection criteria, creating promotions and advertising venues (including development of a website), selection committee identification, evaluation tool development, and candidate selection and notification.

- Advertised the E-TEC (Engineering Talent in Every County) scholarship to over 5,000 potential recipients including all admitted new resident students, prospective students, and STEM and pre-collegiate professionals including ISU Outreach & Recruitment database (high school and CC/JC); PLTW network; STEM initiative programs (i.e., IT Adventures, Taking the Road Less Travelled) regarding ETEC scholarship opportunity. The ISU Extension staff also provided support for the roll-out of the ETEC Scholarship program and assisted in dissemination of the scholarship information.

- Pursued, piloted, and presented at various professional venues to promote ETEC, as well as create engineering career awareness. Professional venues included: Iowa Council for Teachers of Mathematics; County Youth Coordinators and Field Specialists meetings; Iowa State Science Fair; IT Adventure Olympics; PWSE Taking the Road Less Travelled conferences; Project Lead the Way training and other STEM-oriented professional develop programs; Science Bound Kickoff Meeting; and Iowa School Board Association annual meeting.

- ETEC Scholarships were awarded to **54** incoming first year and transfer students. Scholarships were promoted as part of our ETEC career awareness and recruitment events. Scholarship application information was distributed through ISU Extension, admissions, STEM program initiatives, and community college networks.

➢ *Action.* Designed an E2020 scholarship program (www.engineering.iastate.edu/E2020) for a new NSF S-STEM grant awarded in 2008. This program will be leveraged to advance the SEEC networking objective.

- Co-curricular programming for the fall 2009 scholars is in development. See www.E2020groupsite.com. This program emphasizes contemporary engineering content, student development programming, student participation and leadership development pedagogy, and gender, ethnic, and socio-economic relevance.

- Collaborated with the ISU College of Engineering Communications and Marketing personnel to create a visual identity for the E2020 Scholars program

➢ *Action.* During Summer 2008, SEEC team members and college staff piloted new recruiting materials to incorporate the college's new "2050 Challenge" mission, which, captures the national movement to redefine engineering as being vital to the future well-being of society. The 2050 Challenge is summarized at http://www.engineering.iastate.edu/the-2050-challenge.html. The new recruiting materials used elements of this mission to broaden the appeal of engineering as field that makes a difference in people's lives.  A web version of the materials is online at: http://www.eng.iastate.edu/discovery/. The challenge-oriented presentation of engineering study provided a broader perspective with which prospective students could explore societal problems to be solved, and from there, learn more about engineering majors. These materials will be referred to as *Your Challenge, Your Choice (YCYC).*

➢ *Action.* During Fall 2008, SEEC team members, Engineering Enrollment Services staff, Engineering Communications staff, and University Marketing met with ZLR IGNITION, a marketing agency in Des Moines. ZLR led the university's recent marketing campaign and thus has done extensive research related to ISU recruitment. The meeting introduced the Networking objective of the SEEC project, presented the College of Engineering's recruiting goals and its "2050 Challenge" mission, overviewed the YCYC materials, and reviewed national data including the NAE reports on the Public Understanding of Engineering and on Changing the Conversation.

- ZLR prepared a proposal for a new engineering recruiting campaign aligned with SEEC project, college, and national needs. The plan was for ZLR to work in collaboration with SEEC and college staff to produce a theme statement, recruiting brochures, website, video, and a recruiting kit. ZLR involved several informal youth focus groups of engineering students and high school students. From among several themes, the project moved forward with a tagline of "Be Creative[2]"and the message to "create a better world". During Spring 2009, ZLR began developing prototypes of materials for college feedback. These materials are now being iterated on, and completion and use is expected during Fall 2009.

➢ *Action.* SEEC Networking is collaborating with another NSF project at ISU, the Female Recruits Explore Engineering (FREE) project. Both SEEC and FREE have increasing the number of girls in engineering as one of the forefront goals of the respective projects. The FREE project has helped to inform the networking activities of the SEEC project by acknowledging  (1) the importance of creating informal "communities of practice" opportunities or working with small groups of students, and (2) over time supporting their developing interest; (3) the critical influence positive role models can have on a young person's career development and decision-making, especially under-represented students; and related, (4) the importance of sustained relationship opportunities (especially for under-represented students); and (5) the importance of relevant, gender, cultural, and socio-economic friendly or sensitive information and activities.

**Activity 2.** Collaborate with ISU Extension to implement programs to improve awareness, understanding, and interest in engineering in every county in Iowa. Establish a network to encourage interest. The following action items supporting this activity took place in year two:

➢ *Action.* ETEC initiative (http://www.engineering.iastate.edu/etec/) has partnered with ISU Extension's 4-H STEM programming and field staff to create a resource toolbox for Extension staff and volunteers to facilitate awareness of engineering and career opportunities within science and engineering fields for underserved or under-represented groups. These resources (marketed as a toolbox) are available online for staff at: http://www.engineering.iastate.edu/etec/resources.html

➢ *Action.* Initiated a new project with ISU Extension to develop an online web resource to visually present outreach and recruiting information in map form using GIS (Geographical Information Systems) technology. The resource will serve multiple purposes, with views of interest to external stakeholders such as informal educators who support Extension E-SET programming, to views of interest to the SEEC project, and other ISU staff and faculty who are developing, managing, and evaluating programs for youth, including recruitment. In particular, for SEEC, it will provide an opportunity to let us visually analyze data to determine how well we are reaching out to different parts of the state and region to increase and broaden participation in engineering.

➢ *Action.* Conducted online meetings with Extension staff to both gain input and feedback to the ETEC program proposed activities as well as provide initial training for staff in implementing ETEC Initiatives.

**Activity 3**. Collaborate with DMACC personnel, alumni, and other existing ISU outreach and recruitment network personnel implementing programs to improve awareness, understanding, and interest in engineering. Establish a coordinated network to encourage and facilitate student interest. The following action items supporting this activity took place in year two:

➢ *Action.* The Networking Objective Team worked with DMACC enrollment management and high school programming units and the ISU Program for Women in Science and Engineering (PWSE) to compile, design, and disseminate engineering awareness materials to be used with advisors, counselors, teachers, parents, informal educators, and students. These materials have been disseminated to many key stakeholder groups at and several venues (e.g., group and individual training sessions with DMACC faculty and advising staff; the SEECing Connections Event on May 14th, recruitment staff, faculty, and administrators)

➢ *Action.* Began exploring and operationalizing the development of a communication plan to identify and reach current DMACC Arts and Science, Career Advantage, and dual credit high school students with math and dcience interests, aptitudes or strong math and science Compass scores regarding the opportunities and scholarships in engineering.

➢ *Action.* At DMACC much work has taken place to position the institution to systematically engage in concerted efforts to communicate with, recruit, and advise students to enter the field of engineering. Presentations have mainly been internally to departments within the college to educate the staff on the field of engineering. Additional training and time has been spent to jointly work with ISU to better inform students in DMACC's Career Advantage

program and potential transfer students at DMACC about opportunities which are available in engineering.

## Evaluation Objective Team

To evaluate project effectiveness and improve project activities.

**Activity 1.** Apply quantitative and qualitative evaluation methods (both formative and summative) to improve project activities. The following action items supporting this activity took place in year two:

➢ *Action.* In collaboration with team members from the Learning Village and Advising O-Teams, conducted several focus groups for EGR 100 students. Analyzed the qualitative data for thematic results and presented findings to SEEC Executive and O-Teams.

➢ *Action.* In collaboration with team members from the Learning Village and Advising O-Teams, conducted a focus group for SEEC Peer mentors. Analyzed the qualitative data for thematic results and presented findings to SEEC Executive and O-Teams.

➢ *Action.* In collaboration with team members from the Learning Village and Advising O-Teams, developed pre- and post-surveys for engineering community college transfers. Put surveys online to facilitate online data collection. Data are still be collected and analyzed at this point.

➢ *Action.* In collaboration with other SEEC team members conducted a SEEC project workshop using the development of Logic Models for planning grant activities in year 2 – See Appendix B for workshop outline.

➢ *Action.* Numerous discussions and meetings with SEEC team members at ISU and DMACC on development of SEEC database(s) and variables to track retention and enrollment of College of Engineering students. Focusing on transfer students from DMACC as well as new freshmen students in the College of Engineering.

➢ Provided assessment and evaluation consulting and assistance to all SEEC O-Teams.

**Activity 2.** Create and use internal and external advisory groups. The following action items supporting this activity took place in year two:

➢ *Action.* Internal and External Advisory Board teams were assembled. They are:

**ISU Institutional Advisory Board (Internal to ISU)**
**Chair:** Elizabeth Hoffman, *Office of the Executive Vice President and Provost*
Sandy Gahn, *Office of Institutional Research*
Doug Gruenewald, *Learning Communities*
Connie Hargrave, *Center for Technology in Learning and Teaching*
Thomas Hill, *Vice President of Student Affairs*
Mary Holz-Clause, *Extension and Outreach*
Gary Mirka, *Industrial and Manufacturing Systems Engineering*

**DMACC Institutional Advisory Board (Internal to DMACC)**
**Chair:** Robert Denson, *President*
Kim Linduska, *Executive Vice President for Academic Affairs*
Randy Mead, *Executive Dean for Program Development*
Mark Steffen, *Executive Director for Program Development*
James Stick, *Academic Dean for Arts and Sciences*
Frank Trumpy, *Senior STEM Instructor*
David VanderLinden, *District Chair for the Sciences Department, Professor of Chemistry*
Laurie Wolf, *Executive Dean for Student Services*

**External Advisory Board**
**Chair:** Jim Melsa, *ISU Dean Emeritus, College of Engineering*
Kimberly Douglas, *Kansas State University*
Robert Driggs, *Kirkwood Community College*
Leigh Hagenson Thompson, *The Dow Chemical Company*
Ken Maguire, *Iowa Department of Education*

## Dissemination Objective Team

To share best practices on campus in other areas of STEM, with other community colleges in Iowa, with other institutions in the Big 12 consortium, and at national meetings.

**Activity 1 .** Coordinate activities and share practices with related efforts on the ISU and DMACC campuses. Transition results to other STEM disciplines and community college partnerships.

➤ *Action.* A Web site specific to the SEEC project was established. Monthly updates to this site help keep team members, advisory board members, and other interested parties current on the project's progress. It also provides resources related to the project. The site has seen 341 unique visitors between 11/25/09 and 6/9/09, with 62% of these users being returning visitors. These returning users spend an average of nearly six minutes per visit on the site – nearly two minutes longer than the average time spent by first-time visitors. This indicates that returning visitors are finding value in the site. See Appendix E for a screen shot of the SEEC website welcome page.

➤ *Action.* On January 8, 2009, the SEEC project newsletter, *Connections*, was sent to 21 Advisory Board members. A second version targeting additional interested parties was sent to 99 others. The newsletters provided information about the SEEC project. A spike in SEEC Web site activity occurred on January 8 and 9. This, combined with evidence from the newsletter tracking system, showed that the newsletter helped drive traffic to the SEEC Web site. The second editions of *Connections* are scheduled to be sent June 23, 2009. (http://www.eng.iastate.edu/emails_html/SEEC-News/spring09board.html). See http://www.eng.iastate.edu/enews/seec-news/fall08welcome.html for a copy of the first newsletter.

➤ *Action.* A press release was created for the E2020 Scholars program to announce its launch. An additional press release was created to announce the first "class" of E2020 Scholars. These releases were used in the College of Engineering's *E-News* and *Alumni E-News* newsletters, which reach audiences of 610 and 19,700 respectively. Another release was

written for E2020 Scholars to use in their local newspapers to announce their acceptance into the program and receipt of an E2020 scholarship.

➤ *Action.* A press release was created for the E-TEC program to announce its launch. An additional press release was created to announce the first "class" of E-TEC Scholars. These releases were used in the College of Engineering's *E-News* and *Alumni E-News* newsletters, which reach audiences of 610 and 19,700 respectively. They were also disseminated through the Iowa State Extension network, which reaches all counties in Iowa. An additional release will be developed for the E-TEC scholarship recipients to use in their local newspapers to announce their receipt of the E-TEC scholarship.

➤ *Action.* A press release was created to describe the SEECing Connections workshop. This release was used in the College of Engineering's *E-News* and *Alumni E-News* newsletters, which reach audiences of 610 and 19,700 respectively. It was also disseminated to individual College of Engineering communications departments and to DMACC's media liaison for use in their internal communications.

➤ *Action.* Updates to the E2020 Scholars program Web pages are being planned. The goal of this project is to create more comprehensive and user-friendly Web pages for those seeking information about the program and for those applying to the program.

➤ *Action.* Updates to the Engineering Scholarships pages will be completed this summer. The goal of this project is to create more comprehensive and user-friendly Web pages for prospective and current engineering students seeking financial assistance.

➤ *Action.* Updates to the general prospective students' pages are being planned. The goal of this project is to create more comprehensive and user-friendly Web pages for prospective students seeking information about Iowa State's College of Engineering.

**Activity 2.** Create an active network of Big 12 institutions to advance STEM recruiting and retention in the central United States. Organize regional forums on best practices in STEM involving the Big 12, including sharing project outcomes among institutions having NSF STEP grants.

➤ *Action.* Mary Darrow, Diane Rover, and other members of the leadership team developed a workshop for the 2009 ASEE conference in Austin, Texas. The goal of the workshop titled "**Engineering Recruitment and Retention STEP Workshop**" was to bring members of the Big 12 schools together to discuss and share best practices and challenges with their NSF grants with other institutions. A copy of the workshop abstract, agenda, and a list of participants can be found in Appendix C of this report.

➤ *Action.* A Big 12 STEP Network Web site has recently been added to the SEEC Web site. This site will serve as a resource for Big 12 STEP grantees.

**3.2 Findings and Conclusions from Year Two Activities**

In this section, we describe the findings (i.e., what we have learned) from SEEC activities/action items conducted in year two. Findings are listed below by leadership and objective teams.

*Project Context*

The following, reported in year one, is worthy of mention again as a new institutional context in which the SEEC project is being conducted. The university has transitioned to a form of decentralized budgeting, or resource centered management, referred to locally as the Resource Management Model, RMM. It began Fiscal Year 2009 (July 1, 2008). So Resource Responsibility Centers (i.e., units such as colleges) have been operating under the model for one year, keeping track of revenues and expenses. The success of the college is now tied to the success of the college's financial management under the RMM. Recruitment and retention have expanded in strategic value under RMM. While recruitment, retention, and graduation data have long been used to measure the success of the college, academic programs, and students, and data have been maintained for educational, benchmarking, and reporting purposes, data are now being monitored and prioritized for budgetary purposes.

**Learning Village and Advising Objective Teams**

- Through our efforts we have increased the number of pre-engineering students enrolled in the EGR 100 course, and also the number who participate in the E-APP program. Both of these increases are the direct result of marketing and communication regarding the course, and the benefits of the E-APP program.
- We have concluded that ISU Advisors are one of the most important links between DMACC's pre-engineering program and ISU's College of Engineering. The feedback on the program has been very positive, and we have used this in marketing brochures and communication with students directly by speaking to the EGR 100 and Calculus II students at DMACC over the past semester. Students respond to presentations by ISU faculty during the EGR 100 course, and this will continue in the near future, as this allowed students to connect with ISU engineering faculty and the different engineering majors at ISU.
- In addition to ISU faculty visits with potential transfer students, peer mentors play a pivotal role in helping to recruit and to retain engineering transfer students.

**Curriculum Objective Team**

- In the second year, preliminary discussions and benchmarking of first-year curriculum and other programs have the set the stage for planning and development in year three by faculty and staff. There has been increased awareness and attention by college faculty and administrators in curricular activities related to the SEEC project. The new NSF S-STEM grant includes a curriculum component for learning communities that provides specific direction for outcomes-based student development across the Curriculum and Learning Village objectives. The new university initiative with MAP-Works, with extended use in Engineering in 09-10, will provide a tool that enhances first-year retention and success activities across the Curriculum, Advising, and Learning Village objectives.

**Networking Objective Team**

- Clear conclusions from our activities which have emerged are the need to create materials, identify target audiences, develop communication plan, and publications which are targeted specifically for the student populations at all of the various levels which have been identified. This will enable more effective processing and communication at all levels. On-

site visits with ISU advisors and faculty solidified and developed greater understanding of both institutions. Better understanding of other institutional STEM grants helped facilitate ideas and programming for us.

- Year two included a comprehensive and arduous process of developing youth-friendly, 2050 Challenge-grounded, messaging/identify campaign for prospective students. The arduous aspect of this process was determining scope (audiences who would use the message and branding elements) and faculty and staff who would need to endorse and embrace the new campaign, and how to interweave youth-friendly/*Changing the Conversation* content with 2050 Challenge materials in their current form. We determined that the audiences would be prospective students and admits; the endorsement would be limited to College of Engineering senior leadership, marketing personnel and outreach and recruitment staff; and 2050 Challenge concepts could be morphed into topics relevant to teens.

- We have continued to develop Personal Engineering Recruitment (PERK) kits, but have found that much of the information that is most useful for engineering awareness and recruitment is on-line. In this year, we have built an ETEC "Discover Engineering" web page which we are now using in all of training and presentations with faculty, staff, parents, informal educators, and students. We will continue to develop and update this resource page as we continue to find resources that are useful towards engineering awareness and recruitment.

- ISU Extension provides an extensive network of programs and staff who can serve as conduits and facilitators of engineering career awareness resources and activities. We have been working to build this capacity through information sharing and training using the Adobe Connect web conferencing system. Since ISU Extension spans the state of Iowa, utilizing this system will continue to be effective in building this capacity. As a result of SEEC networking collaborations with ISU Extension toward improving engineering awareness and understanding in every county, ISU Extension has devoted more emphasis to 4-H programming about engineering.

## 3.3 Opportunities for Training and Development from Year Two Activities

The team members, even those involved peripherally, have gained greater awareness about assessment and evaluation in relation to recruitment, retention, and student learning. Transfer student learning and success have been a focus of discussions during year two, and thus substantial information has been shared. This awareness will be translated into actions as the project continues.

- The teaching skills and experience of a SEEC graduate student, as well as both DMACC and ISU faculty member has been enhanced through continuous involvement and improvement of the EGR 100 course. Student evaluations and focus groups have driven the process to enhance program development.

- Providing professional development and resources to advising staff at both the community colleges and at ISU serves to improve advising services to engineering transfer students. A major goal of these interactions is to develop relationships and connections between

institutions and between community college and ISU advising staff.  These relationships contribute to improving the transition of transfer students into Iowa State.

- The SEEC leadership team will continue to generate and disseminate evaluation and student demographic data (i.e., SEEC Data Briefs) to be used within various college and university committees and professional development events to inform recruitment and retention initiatives.

- Consulting with the groups mentioned above to ensure the proper communication and processes take place within the project.  This will enable a more effective assurance of implementation of the communication pieces and activities associated with these students as we progress into year three.

- Through the Networking O-Team work, we have used research to inform our work to transform the messaging that is used to promote engineering.  Through this process we are continually educating faculty, staff, and students to messaging and recruitment practice that reflects the new messaging for engineering for the future.  Research and best practice are used to guide our work to inspire, educate, and attract underrepresented minorities and females into engineering.

## 3.4 Outreach Activities from Year Two Activities

The list below describes the numerous outreach activities in which the SEEC project was involved for year two.

- The Learning Village O-Team developed a number of presentations for groups who were previously unaware of the various learning village activities (e.g., learning communities, E-APP, EGR 100). Some of these groups have joined the efforts of the learning village either through direct collaboration or in a partnership. The learning village O-Team presented a paper titled "A Learning Village: Utilizing a Holistic Approach to Create Connections Between Community College Pre-engineering Students at Iowa State's College of Engineering," at the 2009 ASEE Conference.

- All news items are listed at the project website: http://www.eng.iastate.edu/seec/news.shtml

- Presentation at the 2009 National Association for Student Personnel Administrators (NASPA) National Conference (March, 2009)
    - o **Understanding Today's Transfer Students:  Implications for Practice, Policy, and Research, Programming by** Frankie Santos Laanan, PhD, Associate Professor, Iowa State University**,** Latrice Eggleston, Clinician, Iowa State University**,** Mary Darrow, MSE, Program Coordinator, Iowa State University**,** Dimitra Jackson, Graduate Assistant, Iowa State University.

- Curriculum activities have had limited outreach aspects during year two. The first-year outcomes areas of leadership, innovation, systems thinking, and global awareness (in conjunction with the S-STEM grant) have been highlighted in presentations to prospective

students/parents and news releases, thus improving public understanding of the breadth of engineering education.

- Overall, there has been extensive communication about the project to various audiences within the college, university, ISU Extension, state, community colleges, prospective students, and Big 12 institutions.

- By working with ZLR IGNITION to incorporate the new message into engineering recruitment materials, we are simultaneously educating a marketing firm that does considerable business with youth audiences. Consequently, there is some potential that their new and improved understanding of engineering and more generally STEM will have at least a subtle influence on other marketing campaigns.

- Networking O-Team's internal activities have targeted a strategy to implement the communication plan and activities in the local schools and the college. A communication plan was initiated which will be more fully implemented in the fall when staff return from summer and when students start their fall terms at both the high schools and the college.

- Networking O-Team offered session at Discover DMACC Day created for Pre-engineering students and parents.

- Networking O-Team distribution of Pre-Professional Brochures which highlights Pre-engineering.

- Networking O-Team luncheon with High School Counselors regarding Pre-Professional Programs which highlighted and targeted Pre-Engineering

## 4. Publications and Products

The following is a list of the products developed and disseminated in year two of the SEEC project.

- Enhancement of the project website and updates continued to be posted on the project website was developed which can be accessed at: http://www.eng.iastate.edu/seec/ (see Appendix E for website welcome page).

- SEEC Newsletter for dissemination of project information to various SEEC stakeholders. http://www.eng.iastate.edu/enews/seec-news/fall08welcome.html

- Transfer Student Website developed and utilized with the SEEC project: http://www.eng.iastate.edu/transfer

- Pathway to a STEM baccalaureate degree website developed and utilized with the SEEC project: http://www.public.iastate.edu/~laanan/pathway2stem/homepage.html

- Developed and disseminated marketing brochure for the E-APP (Engineering-Admissions Partnership Program) and posters for display at Iowa community colleges. See Appendix F for a copy of the E-APP Brochure.

- Two items were developed by the SEEC executive team for the **NSF Division of Undergraduate Education (DUE) STEP Grantees Meeting**, March 12-13, 2009.
  - o SEEC Project Abstract, http://www.eng.iastate.edu/seec/seec-abstract.pdf
    (see Appendix G for Project Abstract)
  - o SEEC Project Poster,
    http://www.eng.iastate.edu/seec/reports/SEECPoster_3.09.pdf
    (see Appendix H for Project Poster)

- **NASPA Conference** (Student Affairs in Higher Education) – Seattle, WA
  *Understanding Today's Transfer Students: Implications for Practice, Policy, and Research*
  Presented by Frankie Santos Laanan, Mary Darrow, and Dimitra Jackson – Iowa State University.

- **Iowa State's Program for Women in Science in Engineering (PWSE) Taking the Road Less Traveled Career Conference** – Iowa State University, Ames, IA – *Engineering Talent in Every County (ETEC)*
  Presentation to high school and middle school teachers by Monica Bruning and Mary Darrow.

- **ASEE Annual Conference & Exposition** - Austin, TX
  *A Learning Village: Utilizing a holistic approach to create connections between community college pre-engineering and Iowa State engineering students*
  Presented by Mary Darrow, Mary Goodwin, and Jackie Baughman Engineering Recruitment and Retention STEP Workshop [pdf]
  Presentations by Big 12 NSF STEP Project Leaders (hosted by Iowa State University).

- **Iowa 4-H Youth Conference** –Iowa State University, Ames, IA
  *E-TEC (Engineering Talent in Every County)*
  *Voyage into Engineering with a Scholarship in Hand!*
  Monica Bruning will present information about the E-TEC program to high school 4-Hers and advisors.

- The SEEC grant was referenced in an local Des Moines TV broadcast
  http://www.engineering.iastate.edu/index.php?id=7190

- The SEEC grant was reference in an official ISU news release
  http://www.news.iastate.edu/news/2009/jun/admissions

- We have redesigned the College of Engineering Scholarship Page to include two new scholarships, E2020 and Engineering Talent in Every County (ETEC).
  http://www.eng.iastate.edu/scholarships/transfer.asp.  Each of these scholarships has their own web presence that was developed through this project.  The ETEC Scholarship is funded through this project and the E2020 Scholarship is funded through a new NSF S-STEM grant.

- As a follow-up to the "SEECing Connections" professional development events, we have posted all training materials to our SEEC website at the following link: http://www.eng.iastate.edu/seec/seec_pdresources.shtml. The hope is that participants will continue to utilize this information in the objective team, program, and institutional planning moving into year 3 of this project.

- Project Lead the Way sites in numerous schools within the district. DMACC has developed a methodology to track the students they are communicating with as they attend the community college system and as they enter the four year college systems. We will continue to work through SEEC to develop this pathway into engineering at ISU.

- A DMACC pre-engineering college code was added to the DMACC college data base to track students interested in engineering. We will continue to work through SEEC to develop pathways and communication streams for pre-engineering students at DMACC.

## 5. Contributions, Major Accomplishments, Innovations, and Successes of Project

During year two, the SEEC project has expanded its reach, as evidenced by the partnerships involved in the project and the communications and events for widening communities. The activities of SEEC team members – directly and indirectly in relation to SEEC objectives – support and inform the development of resources and tools for recruitment and retention of engineering students. The following subsections highlight advances made through the project during year two.

### 5.1 Contributions to the principle discipline of the project

The SEEC project has achieved greater visibility in the college during year two, and as a result, there is greater awareness about recruitment and retention issues. This awareness then fosters new dialogue among faculty and staff as a first step to active participation on SEEC and related objectives. Attracting and engaging more students in the discipline and helping students to succeed in engineering will strengthen the academic programs.
DMACC has created a pre-engineering area for students. This will improve their preparation for engineering study and enable a smoother transition.

Our Engineering Admissions Partnership Program which strives to create a learning community that provides deliberate connections to community college students while still in the community college affords a unique contribution to transfer student interventions. Through this effort, we are connecting community college students to advisors, resources, transfer planning, events on campus, and peer mentors in hopes of increasing transfer student success and engagement both before and after transfer.

Through our programs with community college advisors and ISU advisors we are creating a community of advisors who can help each other and provides resources to each other that will help improve the transfer process.

Through the database on performance of transfer students we can readily see problems areas of course selection that can be use to improve advising at both the community college and at ISU.

Communication pieces need to be very specific and targeted in order to ensure they are effectively utilized in the K-12s and the college. The success of the students in the preliminary study provides very valuable information as we proceed into the following years of the grant.

## 5.2 Contributions to other disciplines in science or engineering

DMACC's activities support not only pre-engineering students, but also students with STEM interests. Consequently, these students will gain new information about study and career opportunities in STEM fields.

While offering new programs and services to prospective transfer students, the college is also sharing information with students, faculty, and staff involved with STEM programs at community colleges. This will enhance their understanding of engineering, and may provide insights on the relationships between science, math, and technology fields with engineering.

Learning communities in engineering have proposed greater interaction with ISU math, physics, and chemistry faculty, and this is expected to influence course content.

The partnerships on campus are not restricted to engineering. There is extensive collaboration with, for example, the Program for Women in Science and Engineering, and the Center for Excellence in Science, Math, and Engineering Education (CESMEE). Consequently, some of the activities of SEEC lead to interactions that address STEM more broadly.

Specific study of students in these areas will help us communicate more effectively with students at the junior high and high school levels. Expanded studies will also be of value as we proceed and examine how these students do.

## 5.3 Contributions to the development of human resources

The partnerships that have formed in relation to SEEC have shared knowledge and practices and have created new collaborations and groups. Whether formally or informally, this results in training and professional development for faculty and staff. The DMACC-ISU professional development workshop sponsored by SEEC was the first of its kind and reached over fifty faculty and staff. The ASEE workshop sponsored by SEEC was also the first of its kind, and it involved participants from institutions in the Big 12 and beyond. The online meetings held with ISU Extension staff around the state were also novel opportunities for these staff to gain access to information and resources.

Increasing and broadening the interest in engineering and improving the satisfaction and success of engineering students will ultimately grow the engineering workforce, and this goal of the STEP program is the motivation for all SEEC activities and accomplishments.

Much has been gained from collaborative meetings and instructional sessions to learn more about the transfer process and specifically the area of engineering at ISU. Continued education and development in this area will be ongoing and crucial for the success of the students.

**5.4 Contributions to the physical, institutional, or information resources that form the infrastructure for research and education**

There are several examples in which SEEC project activities are contributing to the educational infrastructure at ISU and DMACC. Institutionally, the E-APP program has been a factor in, and a benefactor of, the success of the university's APP program. The emphasis on learning communities through SEEC has been mutually beneficial to the vitality of LCs in engineering. Also, the SEEC project reinforces the college's stake in recruitment, retention, and student success, and thereby brings new opportunities to leverage university resources. For example, Engineering was one of two colleges to gain greater access to the MAP-Works tool and data to complement current activities. The collaborative activities with ISU Extension are resulting in new information resources to be used internally and externally, possibly creating a tool with campus-wide applicability. In Engineering, the SEEC project has provided the impetus to develop a transfer recruitment enterprise in the college, something that was not previously in place. The emphasis on communications during year two resulted in new capabilities and materials to share information about the project and educational programs.

Documents which can be created and utilized will be very beneficial. Also, collaboration between DMACC and ISU will help educate staff on both sides so that better efforts can result. Again, specific study of students in these areas will help us communicate more effectively with students at the junior high and high school levels. Expanded studies will also be of value as we proceed and examine how these students do.

As we begin to collect, compile, and disseminate both research and evaluation data related to our SEEC objectives, dissemination of this information through SEEC data/research briefs and publications will continue to be a priority and will expand in the latter years of the project.

**5.5 Contributions to other aspects of public welfare beyond science and engineering**

E-TEC scholarships offered during year two provided financial aid to students entering engineering in difficult economic times.

The combined mission of the college and SEEC to change the perception of engineering and emphasize its impact on people and society is part of the national and global movement.

Expanding and improving the colleges' recruitment and retention efforts to community colleges expands access to STEM and engineering fields that did not exist prior to this project. Community college student access to higher education is viewed by many as a public welfare issue as many of the students in community colleges come from lower socioeconomic and underrepresented populations.

# 6. Special Requirements

The SEEC project has no special requirements to report for year two.

Appendix A

**Project Participants and their Roles by Objective Teams**
*roles are defined by Objective Team Leaders

## O1. Learning Village Objective Team

| Participant | Role | Job Title, Department, and Institution | Contact Information |
|---|---|---|---|
| Steve Mickelson | Team Leader | Associate Professor, Associate Chair, Agricultural and Biosystems Engineering; Director of Assessment, College of Engineering; Director of Center for Excellence in Learning and Teaching, ISU | estaben@iastate.edu |
| Paul Castleberry | Member | Student Services Specialist, Engineering Academic/Student Affairs, College of Engineering, ISU | paulca@iastate.edu |
| Lora-Leigh Chrystal | Member | Program Coordinator, Program for Women in Science and Engineering, ISU | lchrysta@iastate.edu |
| Jennifer Garrett | Member | Student Program Coordinator (service learning/leadership), Memorial Union, ISU | Garrett1@iastate.edu |
| Doug Gruenwald | Member | Co-Director of Learning Communities, Student Affairs Office, ISU | dgrenwld@iastate.edu |
| Mani Mina | Member | Senior Lecturer, Electrical and Computer Engineering, ISU | mmina@iastate.edu |
| Kevin Saunders | Member | Coordinator of Continuous Improvement, Office of the Provost, ISU | saunders@iastate.edu |
| Harry McMaken | Advisor | Professor, Mathematics/Engineering, DMACC | hlmcmaken@dmacc.edu |
| Randall Jedele | Member | Instructor, English, DMACC | rejedele@dmacc.edu |
| Randy Smith | Member | Instructor, Mathematics, DMACC | rrsmith@dmacc.edu |
| Mary Goodwin | Member | Advising and Transfer Programs Director, Student Services, College of Engineering, ISU | goodwinm@iastate.edu |
| Mary Darrow | Member | Program Coordinator, Educational Leadership and Policy Studies, ISU | mdarrow@iastate.edu |
| Devna Popejoy-Sheriff | Member | Academic Advisor, Industrial and Manufacturing Systems Engineering | devna@iastate.edu |
| Jackie Baughman | Member | Graduate Student, Agriculture and Biosystems Engineering | Jacqulyn@iastate.edu |

## O2. Curriculum Objective Team

| Participant | Role | Job Title, Department, and Institution | Contact Information |
|---|---|---|---|
| Diane Rover | Team Leader | Associate Dean and Professor, College of Engineering, ISU | drover@iastate.edu |
| Mary Goodwin | Collaborator (Advising Team, FY success, transfer plans) | Director of Academic Advising and Transfer Relations, COE, ISU | goodwinm@iastate.edu |
| Mani Mina | Collaborator (FY development) | Senior Lecturer, ECE, Director of Engineering Studies Minor, COE, ISU | mmina@iastate.edu |
| Krishna Athreya | Peripheral participant (FY leadership development, service learning, S-STEM outcome leader) | Engineering Leadership Program Director, Adjunct Prof. (MSE) COE, ISU | Ksa1@iastate.edu |
| Mike Kalkhoff (ChE) | Peripheral participant (FY leadership development, service learning) | Undergraduate students, Engineering Leadership Program Student Director, College of Engineering, ISU | |
| Larry Genalo | Collaborator (FY Steering Committee) | University Professor. MSE, COE, | |
| Tom Brumm | Collaborator (FY Steering Committee, S-STEM co PI) | Assoc. Professor, ABE, Director of Assessment, COE, ISU | |
| Joel Johnson | Collaborator (FY Steering Committee, S-STEM, FY development/success) | Director of Student Programs and Services, COE, ISU | |
| Steve Mickelson | Collaborator (Learning Village, ELP, FY development) | Associate Professor, Associate Professor, ABE; Director of Center for Excellence in Learning and Teaching, ISU | estaben@iastate.edu |
| Paul Castleberry | Peripheral participant (LCTT) | Student Services Specialist & Learning Communities Coordinator, COE,, ISU | paulca@iastate.edu |
| Nancy Knight | Peripheral participant (climate, PERUSE) | Graduate Enrollment, Management Director, College of Engineering, ISU | nknight@iastate.edu |
| Derrick Rollins | Collaborator (FY development/success, SPEED program) | Professor, CBE; Assistant Dean for Diversity, COE, ISU | drollins@iastate.edu |
| Loren Zachary | Collaborator (ACCESS) | Professor Aerospace Engineering; Assistant Dean for Engineering Education, Director of Engineering Distance Education, College of Engineering, ISU | zach@iatate.edu |
| Harry McMaken | Collaborator, DMACC Leader | Professor, Engineering and Math; DMACC | hlmcmaken@dmacc.edu |
| Karen Zunkel | Peripheral participant (TRANSIT website; Collaborator on other project objectives related to PWSE) | Director, Program for Women in Science and Engineering, ISU | kzunkel@iastate.edu |
| Roger Bentley | Collaborator (FY Steering Committee) | Manager of Student and Alumni Career Services, COE, ISU | |
| Ginny Arthur | Peripheral participant (MAP-WORKS initiative) | Associate Director of Residence Life, ISU | |

| Chris Rehmann | Peripheral participant (S-STEM outcome leader) | Professor, CCEE, COE, ISU |
| Doug Jacobson | Peripheral participant (S-STEM outcome leader) | University Professor, ECE, COE, ISU |
| Amy Kaleita | Peripheral participant (S-STEM outcome leader) | Assoc. Professor, ABE, COE, ISU |
| Balaji Narasimhan | Peripheral participant (undergraduate research) | Assoc. Dean for Research, Professor, CBE, COE, ISU |

## O3. Advising Objective Team

| Participant | Role | Job Title, Department, and Institution | Contact Information |
|---|---|---|---|
| Frankie Santos Laanan | Team Leader | Associate Professor, Educational Leadership and Policy Studies, ISU | laanan@iastate.edu |
| Mary Darrow | Co-Team Leader | Program Coordinator, Educational Leadership and Policy Studies, ISU | mdarrow@iastate.edu |
| Mary Goodwin | Co-Team Leader | Director of Undergraduate Advising, College of Engineering, ISU, | goodwinm@iastate.edu |
| Doug Beck | Member | Advising Coordinator, Mechanical Engineering, ISU | dbeck@iastate.edu |
| Ted Millen | Member | Advisor, Civil Engineering, ISU | |
| Vicky Thorland-Oster | Member | Manager, Electrical and Computer Engineering Student Services, ISU | vlthorl@iastate.edu |
| Tony Moore | Member | Advisor, DMACC | |
| Ahmed Ageyman | Member | Advisor, DMACC Ankeny Campus | akagyeman@dmacc.edu |
| Anne Howsare | Member | Interim Vice Provost/Counselor, DMACC Urban Campus | amhowsare@dmacc.edu |

## 04. Networking Objective Team

| Participant | Role | Job Title, Department, and Institution | Contact Information |
|---|---|---|---|
| Monica Bruning | Team Leader | Director of Talent Expansion, Academic/Student Affairs, College of Engineering, ISU | mbruning@iastate.edu |
| Jay Staker | Member | Youth Development Specialist, ISU Extension | jstaker@iastate.edu |
| Carol Heaverlo | Member | Program Coordinator, Program for Women in Science and Engineering, ISU | heaverlo@iastate.edu |
| Doug Beck | Member | Advising Coordinator, Mechanical Engineering, ISU | dbeck@iastate.edu |
| Mary Darrow | Member | Program Coordinator, Educational Leadership and Policy Studies | mdarrow@iastate.edu |
| Laura Doering | Member | Associate Registrar and Director of Transfer Relations, ISU | ljdoer@iastate.edu |
| Randy Gabriel | Member | Director, Program Development, DMACC | Rgabriel1@dmacc.edu |
| Randy Mead | Member | Executive Dean, Program Development, DMACC | ramead@dmacc.edu |

| Michael Lentsch | Member | Director, Enrollment Management, DMACC | mjlentsch@dmacc.edu |
|---|---|---|---|
| Cindy Spurlock | Member | Office coordinator, ISU Engineering | spurlock@iastate.edu |
| Sokish Sands | Member | Academic Advisor, Success Center, DMACC | stsands@dmacc.edu |
| Susie Demoss | Member | Secretary, ISU Engineering | sdemoss@iastate.edu |
| Sadie Kohlhaas | Member | Recruiter, ISU Engineering | slk@iastate.edu |
| Sandy Spilker | Member | Extension Communication Specialist, ISU | sspilker@iastate.edu |
| Carole Custer | Member | Director of Marketing | cacuste@iastate.edu |
| ZLR & Associates | Member | Marketing | |
| ESPP Student Staff | Member | | |
| 4-H Youth support staff | Member | | |
| Eric Dieterle & Staff | Member | COE, Director of Marketing | dieterle@iastate.edu |
| LaTosca Goodwin | Member | ISU Extension | latosca@iastate.edu |
| Holly Bignall | Member | ISU Extension | hbignall@iastate.edu |
| Brian Webster | Member | ISU Extension | bwebster@iastate.edu |
| Lynette Spicer | Member | ISU Extension | lspicer@iastate.edu |
| Laura Sternweis | Member | ISU Extension | lsternwe@iastate.edu |
| Tina Prouty | Member | ISU Engineering, Database support | tnprouty@iastate.edu |
| Kevin Kane | Member | GIS facility director | kkane@iastate.edu |
| Mike Hoffman | Member | Director of Program Development, DMACC | |
| Megan Mudd | Member | Program Development, DMACC | |
| Dave Kissinger | Member | Program Development, DMACC | dkissinger@dmacc.edu |

## 05. Evaluation Objective Team

| Participant | Role | Job Title, Department, and Institution | Contact Information |
|---|---|---|---|
| Mack Shelley | Team Leader | University Professor, Political Science and Statistics, ISU | mshelley@iastate.edu |
| RM Johnson Cooper | Member | Program Coordinator and Lecturer, Educational Leadership and Policy Study, ISU | robynj@iastate.edu |
| Joe DeHart | Member | Executive Director, Institutional Effectiveness, Assistant to the President, DMACC | jcdehart@dmacc.edu |

Appendix B

Agendas for SEEC Year Two Workshops

SEEC Retreat Agenda
October 1, 2008
DMACC Campus/Ankeny
Building 7, Oak/Maple Room
12:30-4:30 p.m.

| TIME | TOPIC DISCUSSION | LEADER(S) | DESIRED OUTCOME |
|---|---|---|---|
| **12:30-1:30pm** | **Lunch-Bistro Café, Building 7** | **ALL** | |
| **1:00-1:30pm** | **DMACC & ISU Overviews** | **Harry McMaken & Diane Rover (PIs)** | Recognition of Institutional & Cross-Institutional Goals |
| **1:30-2:00pm** | Objectives & Main Activities for Year 2 from Logic Models (Break into OTeams) | Robyn Cooper & O-Team Leaders | Highlight Year 2 Activities; Report Out to Large Group |
| **2:00-3:00pm** | Communication, Coordination, & Contributions to Year 2 Outputs and Outcomes | Diane Rover & Groups | Match Outputs/Outcomes to Overall Project Outcomes; Report Out by Cross-Cutting Groups |
| **3:00-3:45pm** | SWOT Analysis | Frankie Laanan & Kim Linduska | Attainment of Outcomes at Level 3 and Higher |
| **3:45-4:00pm** | Evaluation | Robyn Cooper | Build on Evaluation Planning |
| **4:00-4:30pm** | Discussions, Sharing Information & Best Practices | All | Information Sharing |

# SEECing Connections
**An Event for DMACC/ISU Transfer Advising and Recruitment**
**May 14, 2009**
**Iowa State University**


**9:00    Introductions and Welcome – 136 Union Drive Community Center**


**9:30    Using Data to Inform Transfer Advising and Recruitment**
DMACC Demographic Data - Michael Lentsch and Joe Dehart
DMACC Advising and Student Stories – Ahmed Agyeman
Student Stories, Demographics, Recruitment and Retention Data, etc.
Engineering Transfer Advising "Top 10" - Frankie Laanan, Mary Goodwin, Mary Darrow


**11:00   Lightening Connects**
- Financing and Scholarships – Joel Johnson
- PWISE Resources – Carol Heaverlo
- Diversity Recruitment/SPEED – Lindsey Long
- E-APP – Mary Darrow
- FREE Project – Monica Bruning
- DMACC Advising – Ahmed Agyeman and Shelby Hildreth
- Kudor Assessment and Recruitment – Daron Harris and Angie Neville
- Project Lead the Way – Mike Hoffman
- Online Academies – Dave Kissinger


**12:00   LUNCH – 136 Union Drive Community Center**


**12:30   Engineering Transfer 101 – Mary Goodwin, 1252 Howe Hall**


**1:15    Departmental Tours**


**3:00    Tool Kit Take Away – 1252 Howe Hall**
Talking to Students about Engineering
Review of Resources
Evaluation & Reflection

Appendix C

## ISU/DMACC – Sponsored workshop at 2009 ASEE Conference
## June 14<sup>th</sup>, 2009

### *0574: Engineering Recruitment and Retention STEP Workshop*

*Iowa State University (ISU) and Des Moines Area Community College (DMACC) are sponsoring this workshop for NSF STEP teams at ASEE. The ISU/DMACC project goal is to increase the number of engineering graduates. NSF's STEM Talent Expansion Program (STEP) seeks to increase the number of students receiving associate or baccalaureate degrees in established or emerging STEM fields. We hope to develop ASEE as a venue for collaboration among NSF STEP sites. This workshop invites Big 12 STEP practitioners and researchers to an interactive discussion and networking session. All NSF STEP teams attending ASEE are welcome to join this workshop.*

**0574: Engineering Recruitment and Retention STEP Workshop**
**June 14 2:00 p.m.-5:00 p.m.**
**Neal Kocurek Memorial Austin Convention Center, 16A**
**Moderator(s): Iowa State University**
**Division(s): Minorities in Engineering Division**

**2:00    Introductions & Objectives:**
Diane Rover, Iowa State University
MIND Welcome
**2:25    Overview of NSF Big 12 STEP Sites  – Q & A**
2-3 minute overview from each project followed by Q & A from participants
**2:55    Big 12 STEP Site Presentations:**
Each Big 12 site will provide a **10 minute presentation** highlighting a component of their NSF STEP Project  (50 minutes)
**3: 45    Discussion in small groups:  Informing our Work**
Big 12 leaders will lead discussions in small groups with participants.  The focus will be on providing more in depth discussion related to the presentations and allowing participants to also share and discuss approaches to research and practice related to Engineering/STEM Recruitment and Retention.
**4:10    Big 12 STEP Site Presentations:**
Each Big 12 site will provide a **5 minute presentation** highlighting a component of their NSF STEP Project (25 minutes)
**4:35    Discussion in small groups:  Informing our Work**
Big 12 leaders will lead discussions in small groups with participants.  The focus will be on providing more in depth discussion related to the presentations and allowing participants to also share and discuss approaches to research and practice related to Engineering/STEM Recruitment and Retention.
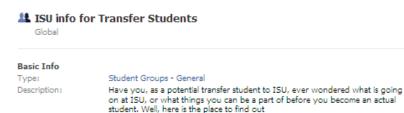 **5:00 – 6:00    Network Meeting for NSF Big 12 STEP Leaders (Rm. ML 9)**
Refreshments will be served

List of Workshop Participants

| # | Title | First | Last | Position | Institution |
|---|---|---|---|---|---|
| 1 | | Ruba | Alkhasawneh | | Virginia Commonwealth University |
| 2 | Dr. | Mary | Anderson-Rowland | Associate Professor | Arizona State University |
| 3 | | Akibi | Archer | Graduate Student | Georgia Institute of Technology |
| 4 | Dr. | Asad | Azemi | Associate Professor | Pennsylvania State University, Media |
| 5 | Prof. | Barbara | Bernal | Professor | Southern Polytechnic State University |
| 6 | | John | Bowles | Associate Professor | University of South Carolina |
| 7 | | Amir | Chegini | Associate Professor | Virginia State University |
| 8 | | Elizabeth | Cook | Director of Diversity & Multi-Cultural Eng. Prg. | University of Oklahoma |
| 9 | Dr. | Raghu | Echempati | Professor | Kettering University |
| 10 | Dr. | Akbar | Eslami | Professor | Elizabeth City State University |
| 11 | Prof. | Ismail | Fidan | Professor | Tennessee Technological University |
| 12 | | Maury | Fortney | Program Director | Walla Walla Community College |
| 13 | | Singli | Garcia-Otero | Program Coordinator | Virginia State University |
| 14 | Mr. | James | Gibson | Professor | Illinois Valley Community College |
| 15 | Dr. | Roger | Gonzalez | Professor | LeTourneau University |
| 16 | | Richard | Harris | Director, NUPRIME | Northeastern University |
| 17 | Dr. | Troy | Henson | Professor & Dean, Retired | University of Texas, Tyler |
| 18 | | Fred | Lacy | | Southern University |
| 19 | Dr. | Kamyar | Mahboub | Professor | University of Kentucky |
| 20 | Prof. | Janice | Margle | Associate Professor | Penn State Abington |
| 21 | Dr. | Afsaneh | Minaie | Associate Professor | Utah Valley University |
| 22 | | David | Pallai | Publisher | Jones & Bartlett Publishers |
| 23 | | Laura | Parr | Counselor | Del Mar College |
| 24 | | Raymundo | Rivera | Engineer | University of Texas, Austin |
| 25 | | Atin | Sinha | Coordinator of Engineering | Albany State University |
| 26 | | Warren | Turner | | other |
| 27 | Dr. | Nicolas | Younan | Professor | Mississippi State University |
| 28 | | Jennifer | Younker | Postdoctoral Fellow | Northwestern University |
| 29 | | Wei | Zheng | | Jackson State University |

Appendix D

Screenshot of SEEC Transfer Student Facebook Page

Appendix E

SEEC Website Welcome Page



# IOWA STATE UNIVERSITY

A Collaborative Project with Des Moines Area Community College

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## STEM Student Enrollment and Engagement through Connections (SEEC)

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Iowa State University
NEW! Big 12 STEP Network
Des Moines Area Community College
ISU College of Engineering
ISU Extension
ISU Office of Community College Research and Policy
National Science Foundation
NSF STEP Program

The STEM Student Enrollment and Engagement through Connections (SEEC) project seeks to increase the number of engineering graduates at Iowa State University by approximately 120 per year. The means to that end are connections rooted in community: learning communities, community colleges, and Iowa communities. The project is collaborative between Iowa State University (ISU) and Des Moines Area Community College (DMACC). The cornerstone of SEEC is the success of learning communities for recruitment and retention, and the project builds upon Iowa State's established learning community infrastructure, leadership, and expertise. Retention at DMACC and ISU will be increased by a new learning community model, called a learning village or meta-community. First-year and gateway engineering courses are being reviewed to better engage students, to provide flexibility, and to support transfer students. Working with DMACC and the STEM Pathway project, student-centered advising is being coordinated to broaden the diversity of students enrolled in engineering and to make students aware of the various paths to successfully completing an engineering degree, including transfer from a community college. Students are advised on the range of STEM disciplines. With ISU Extension, we seek to improve the public awareness and understanding of engineering, especially among students and their parents. The methods of the project serve ISU and DMACC in several contexts and will also be adaptable to other institutions.

**Fast Facts about ISU Engineering**

The undergraduate engineering programs are fourth on the *U.S. News & World Report* ranking of best undergraduate engineering programs among public universities in the region.

The College of Engineering continues to be ranked among the top 25 public engineering colleges in the country, according to the graduate and professional school rankings.

**News**

Iowa State and DMACC partner to increase the number of women and minorities in STEM fields

Learning communities program earns national honor

New engineering scholarships announced

- E2020 Scholarship
- ETEC Scholarship

Collaborating with:

DMACC

Appendix F

E-APP Borchure

Appendix G

SEEC Project Abstract 2009 NSF STEP Meeting

**0653236**, Diane Rover, Monica Bruning, Frankie Santos Laanan, Steve Mickelson, and Mack Shelley, Iowa State University; Harry McMaken, Des Moines Area Community College, **SEEC: Student Enrollment and Engagement through Connections (SEEC)**

The goal of the SEEC project is to increase the number of engineering graduates at Iowa State University by approximately 120 per year. In addition, the percentage of women and minority graduates will approach 20% and 10%, respectively. The project is collaborative between Iowa State University (ISU) and Des Moines Area Community College (DMACC). Project objectives are designed within the areas of learning communities, curriculum, advising, networking, and evaluation. Activities are planned in each of these areas using a logic model approach that identifies resources, outputs, outcomes, and impact. In the first year-and-a-half of the project, progress has been made in developing partnerships. Connecting organizations and people leverages knowledge and resources and promotes strategic, sustainable approaches to meet recruitment and retention goals. For example, 140 community college students attended the Iowa State Engineering Career Fair; 55 DMACC students took EGR100; E-TEC Summits were conducted including over 100 ISU Extension staff; nearly 100 new scholarships are available annually to increase awareness and interest about engineering; and participation by incoming students in engineering learning communities increased to 85%. Project outputs such as these are the result of team efforts and partnering across the university and beyond, including collaborations with ISU academic and student affairs, university outreach programs, ISU Extension, statewide education initiatives, and community college programs. Given the scope of the project and size of the extended team, one of the challenges is communications. Sharing information and engaging stakeholders through various mediums paves the way for effective partnering and advancement of project goals. This year, new communications initiatives have included new recruitment and transfer program brochures, scholarship program postcards and web sites, project newsletters for the advisory boards and college constituents, articles in alumni and faculty/staff newsletters, conference presentations, summit-style meetings, sections in university reports, and a Facebook presence.

Appendix H

SEEC Project Poster 2009 NSF STEP Meeting