

2010

Annual Report – Year Three (Abridged)

SEEC: Student Enrollment and Engagement
through Connections

Report Period: 1 July 2009 – 30 June 2010

Report Prepared by:

*Diane Rover (PI)

Monica Bruning

R.M. Cooper

Mary Darrow

Sandy Jennings Hammond

Frankie Santos Laanan

Harry McMaken

Steve Mickelson

Jason Pontius

Mack C. Shelley, II

*Contact for more information about the SEEC Program

This material is based on work supported by the
National Science Foundation under Grant 0653236



IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY



SEEC Principal Investigators (PIs)

Diane Rover, ISU

Associate Dean for Academic and Student Affairs[†]
Professor, Electrical and Computer Engineering
College of Engineering

Harry McMaken, DMACC

Professor, Engineering and Math

SEEC Co-Principal Investigators (Co-PIs)

Monica Bruning, ISU

Program Manager[‡]
Enrollment Services and Precollegiate Programs
College of Engineering

Frankie Santos Laanan, ISU

Associate Professor
Educational Leadership and Policy Studies
Co-director, Office of Community College Research and Policy

Steve Mickelson, ISU

Professor, Agricultural and Biosystems Engineering
Director, Center for Excellence in Learning and Teaching

Mack Shelley, ISU

University Professor
Political Science and Statistics

[†] Appointment through June 2010

[‡] Appointment through July 2010

SEEC Data Update

The goal of the SEEC Project is to increase the number of engineering graduates at Iowa State University by 100 per year. More specifically the numeric goals of SEEC are as follows:

- Increase in graduates (degrees) per year: 100 (12.5% increase compared to baseline)
- Total graduates per year: approximately 900
- Increase in diversity of graduates per year: increase the number of minority graduates by a minimum of 20 (to 75) and women graduates by a minimum of 45 (to 175)

Year 3 Data – Where are we at now?

Enrollment numbers (new freshmen and transfer students) and retention rates need to increase in order to increase ISU engineering graduates. Just as the 2001-2002 incoming enrollments led to the 2005/2006 peak graduating classes, the 2007-2008 enrollments should lead to the 2012 graduating class, which is the first target class for SEEC. Table 1 shows ISU enrollment numbers for these pivotal years.

Table 1
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
2009	1506	1076	1005	1475	23	5085	1304	252	1575

The fall 2009 new student enrollment in engineering at ISU is 1575 students. Of these new students, 57.5% are residents and 42.4% non-residents; 16.0% are transfers, and 82.8% new freshmen. For fall 2009, 123 DMACC students (8% of all DMACC students at ISU) are enrolled as engineering majors at Iowa State compared to 103 in fall 2008 (7% of all DMACC students at ISU). One hundred fifty-two (152) new transfers from DMACC were admitted in fall 2009 in STEM majors, and of these 47 in engineering. See table 2 below for a more detailed comparison of 2007-2009 enrollment numbers.

Table 2
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
2009	1575	1358	453	123	152	47

Further review of 2007-2009 enrollment numbers for freshmen and transfer students by ethnic minority and gender can be seen in Table 3.

Table 3

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

Enrollment	TOTALS		
	2007	2008	2009
American Indian/Alaskan Native	12	10	20
African American	101	77	119
Asian or Pacific Islander	155	154	187
Hispanic	120	113	124
Total Ethnic Minority	388	354	450
Male	3935	3995	4324
Female	665	681	761
Total	4600	4676	5085

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

Key Programs in Retention and Recruitment

Learning community participation and Admissions Partnership Programs (APP) have been a major focus of SEEC project efforts to enhance recruitment and retention efforts in the College of Engineering.

The learning community program has existed for some time in the College of Engineering, but through SEEC project efforts new learning communities have been added and participation rates have increased over the last three years to expand the concept of the learning village. A learning community specific to engineering transfer students was added this past year. Learning community participation in engineering and other colleges at ISU is shown in the graph below.

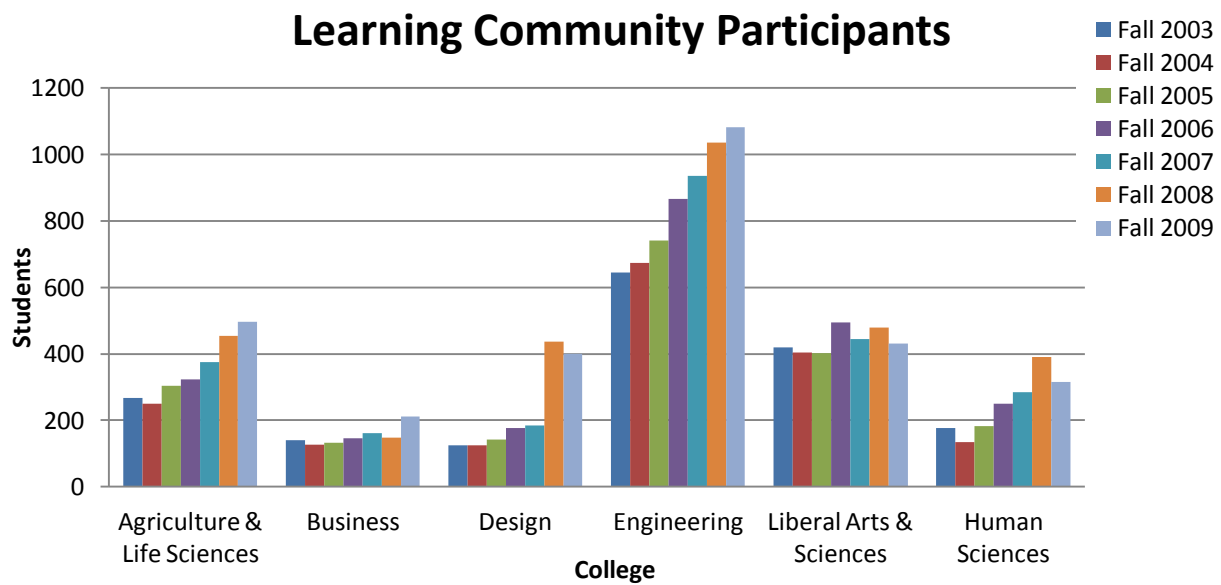


Figure 1. ISU Learning Community Participation, Fall 2003 to Fall 2009

A second ISU program successfully utilized by the SEEC project is the Admissions Partnership Program (APP). SEEC project personnel tailored the APP to focus specifically on pre-engineering students and developed the Engineering – Admissions Partnership Program (E-APP) <http://www.eng.iastate.edu/transfer/APP/EAPPBrochure.pdf>. This program has helped potential students engage with advisors in ISU’s College of Engineering thus helping to facilitate a more successful transfer to ISU’s College of Engineering. Table 4 reports enrollment demographics for E-APP students in the academic year 2009-2010.

Table 4
Enrollment Demographics for E-APP Students, July 1, 2009 – June 20, 2010

	Female	Male	American Indian or Alaska Native	Asian or Pacific Islander	Black (Not Hispanic)	Hispanic	International	Unknown	White (Not Hispanic)
Current E-APP	4	61		2	2	2	1	2	56
Withdrew from E-APP	3	21	1	1	2		1	1	18
Previous ISU Enroll		1							1
Current ISU Enroll	3	49	1	2	2		3	2	42
Total	10	132	2	5	6	2	5	5	117

Note:

“Current E-APP” means they are currently in the E-APP program and have not yet come to ISU.
 “Current ISU Enroll” means they came to ISU at some point and their last registered term is Fall 09, Spring 10, or Summer 10.
 “Withdrew from E-APP” means they were in the E-APP program at one time and withdrew without ever coming to ISU during this period of time.
 “Prev ISU Enroll” means they came to ISU prior to the 09-10 academic year but did not stay through to the 09-10 academic year.

Figure 2 illustrates the E-APP demographic data in table 4. Of the 142 students identified in the table, 52 are now at ISU, 1 previously enrolled at ISU, 24 left the E-APP program, and 65 are still in the E-APP program.

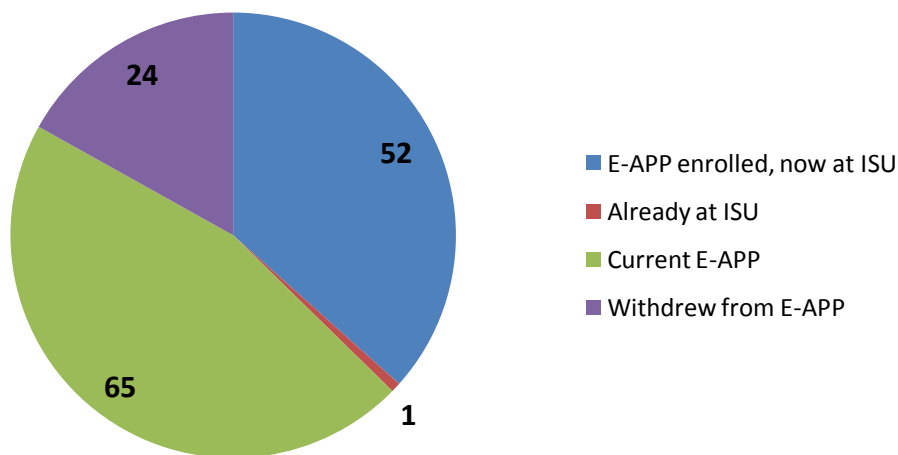


Figure 2. E-APP Participation Rates as of June 30, 2010

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 of the SEEC project is to increase the number of engineering graduates at Iowa State by 100 per year to approximately 900 graduates annually. Included with this goal are increases in the percentages of women and minority graduates in engineering at ISU and the number of pre-engineering students at Des Moines Area Community College.

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.

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 teachers; to tap into diverse communities of students; and to improve the awareness and understanding of 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.

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.

2. Project Participants

Table 5 lists SEEC project participants for 2009-2010, along with their project role, time involvement, and objective team involvement.

The NSF Fastlane Reporting System limits reporting to 25 project participants. Appendix B of the full annual report provides a more detailed list of project participants for year three (2009-2010) and their roles within each of the objective teams.

Table 5

*SEEC Project Participants, Year Three (2009-2010)**

Participant	Institution	Project Role(s)	> 160 Hours	Objective Teams				
				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	Yes			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 Zunkel~	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 Internal and External Advisory Groups

Internal and external advisory boards met twice during year three. The members include:

ISU Institutional Advisory Board (Internal to ISU)

Chair: Elizabeth Hoffman, *Executive Vice President and Provost*

Sandy Gahn, *Senior Analyst, Institutional Research*

Doug Gruenewald, *Co-Director, Learning Communities*

Connie Hargrave, *Associate Professor, Curriculum and Instruction*

Thomas Hill, *Vice President of Student Affairs*

Mary Holz-Clause, *Associate Vice President, Extension and Outreach*

Gary Mirka, *Professor and Chair, Industrial and Manufacturing Systems Engineering*

DMACC Institutional Advisory Board (Internal to DMACC)

Chair: Kim Linduska, *Executive Vice President for Academic Affairs, Ankeny Provost*

Ahmed Ageyman, *Academic Advisor*

Randy Mead, *Executive Dean for Program Development*

Randy Smith, *Professor and District Chair of Mathematics*

Carol (Renee) White, *Professor, Civil Engineering Technology*

Laurie Wolf, *Executive Dean for Student Services*

External Advisory Board

Chair: Jim Melsa, *Professor and Dean Emeritus, ISU College of Engineering*

Kimberly Douglas-Mankin, *Director, Women in Engineering & Science Program, Kansas State University*

Robert Driggs, *Dean of Mathematics & Science, Kirkwood Community College*

Leigh Hagenson Thompson, *Technology Manager & Project Leader, The Dow Chemical Company*

2.3 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. Specific collaborations and activities with SEEC project partners are listed under each of the activity areas in the full report. SEEC partners include:

- E-SET (ISU Extension)
- Program for Women in Science and Engineering (PWSE)
- Iowa 4-H Clubs
- Office of Admissions
- Office of Community College Research and Policy (OCCRP)
- Office of Financial Aid
- Office of the Registrar

- 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)
- Society of Hispanic Engineers Student Chapter
- Strategic Engineering Recruitment Initiatives Coalition
- Iowa High School Principals, Counselors, STEM teachers
- Project Lead the Way Teachers, Iowa
- FLL Robotics
- College of Engineering Diversity Affairs
- Woodward Granger Schools
- ISU Learning Communities

3. Project Activities

This abridged version of the year three annual report emphasizes the learning community and transfer activities of the project. The complete array of activities is summarized in the full annual report.

3.1 Selected Activities

- The college has customized ISU's Admissions Partnership Program (APP) with Iowa community colleges to support prospective transfer students in engineering, called E-APP. As a part of E-APP, DMACC students are assigned an academic advisor, invited to join an online professional network, introduced to ISU transfer peer mentors, and invited to participate in transfer events on campus including the Engineering Career Fair and VEISHEA.
- DMACC has identified pre-engineering student cohorts and created a four-semester learning community. The number of pre-engineering students at DMACC increased from 47 in 2008 to 94 in 2009.
- DMACC, in collaboration with ISU, has created its own introductory engineering orientation course, EGR 100, and revised its advising system for pre-engineering students.
- Through a new transfer peer mentor program, an enhanced peer mentor relationship is being built with pre-engineering students.
- ISU transfer peer mentors, faculty, and staff make presentations in DMACC's EGR100 class.
- PWSE transfer peer mentors and engineering staff visited DMACC EGR100 class and then hosted 7 female pre-engineering students for a networking lunch at the DMACC Ankeny Campus.
- DMACC has significantly advanced its engineering-related programs, communications, and services.
- DMACC has identified, developed, and implemented a comprehensive communication plan that familiarizes high school students, parents, faculty, and staff with career opportunities and educational pathways in engineering.
- DMACC and ISU co-sponsored a Discover Engineering Day at the DMACC Ankeny Campus FFA Building. Eighty high school students (29 female) and 60 parents attended this event. ISU Engineering provided speakers, student orgs, and staff support for this event.

- ISU provided an engineering speaker, dinner, and various speakers and booths at the annual Phi Theta Kappa Conference held at the Boone Campus.
- ISU Engineering provided two sessions and booths at the Innovate Week Events at the DMACC West Campus.
- ISU Engineering hosted over 75 DMACC/ISU advisors and recruiters for the SEECing Connections professional development workshop, to introduce engineering resources, discuss student transfer issues, network, and visit engineering departments.
- 152 new transfers from DMACC were admitted to ISU in the fall 2009 in STEM majors; of these, 47 were in engineering.
- The SEEC Project Executive Team compiles and disseminates transfer student success data, to inform program and policy development.
- Through the complementary NSF S-STEM (E2020) project, ISU provides 4-year \$10,000 scholarships to transfer students, including students from DMACC; www.engineering.iastate.edu/e2020/.

Other Highlights (not specific to SEEC)

- Two ISU engineering departments are actively pursuing 2+2 programs in Industrial Engineering and in Chemical Engineering to expand pathway options for pre-engineering students.
- ISU Engineering has proposed a new Bachelor of Engineering Technology (BET) degree program in information and computer engineering technology, which will afford a new career path for DMACC students.
- ISU Engineering hosts high school and CC/DMACC students for information technology/cyber security competitions through IT Adventures and IT Olympics.
- ISU Engineering provides Project Lead The Way training to high school and CC faculty in Merged Area 11. Regional training recently occurred at the DMACC Ankeny Campus FFA Building. ISU coordinates PLTW certification visits at Merged Area 11 high schools.
- ISU engineering is working with DMACC high school programming staff to plan a FIRST Lego League tournament at the DMACC Ankeny Campus.

Advisory Board Meetings and Reports

Several meetings took place in year three with the internal and external advisory boards. Minutes from the advisory board meetings can be found in Appendix F of the full (non-abridged) annual report.

- A SEEC **Internal Advisory Board** meeting was conducted on December 15, 2009.
Agenda - <http://www.eng.iastate.edu/seec/agenda-iboard-Dec09.pdf>
Presentation Slides - <http://www.eng.iastate.edu/seec/iboard-slides-Dec09-rev.pdf>
Mid-Year Data Update - <http://www.eng.iastate.edu/seec/data-update-Dec09-rev.pdf>
- A SEEC **External Advisory Board** meeting was conducted on December 16, 2009.
Agenda - <http://www.eng.iastate.edu/seec/boardmtgs/external/agenda-eboard-Dec09.pdf>
Presentation Slides - <http://www.eng.iastate.edu/seec/boardmtgs/external/eboard-slides-Dec09.pdf>
Mid-Year Data Update - <http://www.eng.iastate.edu/seec/data-update-Dec09-rev.pdf>
- A SEEC **External Advisory Board** meeting was conducted on April 15, 2010 (small group).
Meeting Notes - <http://www.eng.iastate.edu/seec/eboard-notes-Apr10.pdf>
- A SEEC ISU/DMACC **Internal Advisory Board** meeting was conducted on May 11, 2010.
Agenda - <http://www.eng.iastate.edu/seec/events/internal-board-mtg-2010May11.pdf>
Meeting Notes - <http://www.eng.iastate.edu/seec/iboard-notes-May10.pdf>

3.3 Opportunities for Training and Development from Year Three Activities

The team members, even those involved peripherally, have gained greater awareness about curricular issues in relation to recruitment, retention, and student success. Student diversity and transfer student pathways have been foci of discussions during year three, and substantial information has been shared. This awareness will be translated into actions as the project continues.

The E2020 curriculum groups are involved with curriculum development in areas that will enhance teaching skills, especially in relation to putting engineering into a societal context.

Graduate research assistants and transfer peer mentors on this project have been afforded ample experiences to collect and use data to inform programming decisions and to evaluate impact. Additionally, transfer peer mentors develop leadership and teaching skills through planning and organizing seminars, presentations, and workshops for learning community participants.

Other Opportunities

- Continued relationship building, collaboration, communication, and resource dissemination will lead to increased awareness and public understanding of engineering careers among students, parents, faculty, and staff (including K-14 audiences).
- The project will explore, strategize, and develop approaches to reach and enroll more women and under-represented domestic minority students.
- For this coming year, ISU Engineering has established E-APP as a new ISU learning community, with the intention of increasing community college pre-engineering student engagement prior to coming to Iowa State.
- Further study, dissemination, and professional development related to engineering transfer students' success and retention will lead to more informed programming, advising, and student choices.
- The project will facilitate expansion of pre-engineering offerings at other DMACC campuses. ISU can assist in recruiting new engineering faculty and/or grad students to teach at DMACC.
- Additional funding opportunities exist that can help maintain momentum for 2- to 4-year STEM initiatives (National Science Foundation, Lumina, Iowa Department of Economic Development, Iowa Workforce Development, private funding, etc.)
- Transfer scholarship opportunities and processes need to be a priority in order to ensure access for economically disadvantaged transfer students.