

**Annual Report for Period:**07/2008 - 06/2009

**Submitted on:** 06/30/2009

**Principal Investigator:** Rover, Diane T.

**Award ID:** 0807051

**Organization:** Iowa State University

**Submitted By:**

Rover, Diane - Principal Investigator

**Title:**

E2020 Scholars: Advancing the NAE Vision

### Project Participants

#### Senior Personnel

**Name:** Rover, Diane

**Worked for more than 160 Hours:** Yes

**Contribution to Project:**

**Name:** Shelley, Mack

**Worked for more than 160 Hours:** Yes

**Contribution to Project:**

**Name:** Mickelson, Steven

**Worked for more than 160 Hours:** Yes

**Contribution to Project:**

**Name:** Bruning, Monica

**Worked for more than 160 Hours:** Yes

**Contribution to Project:**

**Name:** Athreya, Krishna

**Worked for more than 160 Hours:** No

**Contribution to Project:**

**Name:** Castleberry, Paul

**Worked for more than 160 Hours:** No

**Contribution to Project:**

Team member and co-leader of the Community Group with co-PI Mickelson. This responsibility aligns with his position in the College of Engineering as Learning Communities Coordinator.

**Name:** Johnson, Joel

**Worked for more than 160 Hours:** Yes

**Contribution to Project:**

Team member and co-leader of the Scholarship Group with co-PI Bruning. This responsibility aligns with his position in the College of Engineering as director of the Engineering Scholarship Program. Member of the E2020 scholarship selection committee.

**Name:** Brumm, Tom

**Worked for more than 160 Hours:** Yes

**Contribution to Project:**

Team member and co-leader of the Curriculum/Assessment Group with PI Rover. This responsibility aligns with his appointment in the College as director of assessment.

#### Post-doc

**Graduate Student**

**Name:** Martinez, Nico

**Worked for more than 160 Hours:** No

**Contribution to Project:**

Graduate student working with diversity programs. Member of the E2020 scholarship selection committee.

**Name:** Joines, Amy

**Worked for more than 160 Hours:** No

**Contribution to Project:**

Student director of the Engineering Leadership Program. Member of the E2020 scholarship selection committee.

**Undergraduate Student**

**Name:** Williams, Ana

**Worked for more than 160 Hours:** No

**Contribution to Project:**

Peer mentor for E2020 cohort. Started in May 2009. This position is paid by the project. In year 2, it will exceed 160 Hours.

**Technician, Programmer**

**Name:** Hill, Gloria

**Worked for more than 160 Hours:** No

**Contribution to Project:**

Assistant to the Associate Dean. Assists the PI with meetings, budgeting, and other project management activities.

**Name:** Stowe, Jane

**Worked for more than 160 Hours:** No

**Contribution to Project:**

Secretary for the Engineering Scholarship Program. Assists the director of the program.

**Name:** Spurlock, Cindy

**Worked for more than 160 Hours:** No

**Contribution to Project:**

Enrollment Services Office Coordinator. Assists team members with prospective student information.

**Name:** Prouty, Tina

**Worked for more than 160 Hours:** No

**Contribution to Project:**

Scholarship Program Coordinator. Assists the director with data management and analysis.

**Name:** Centeno-Diaz, Laura

**Worked for more than 160 Hours:** No

**Contribution to Project:**

Diversity Programs Coordinator. Member of the E2020 scholarship selection committee.

**Other Participant**

**Name:** Jacobson, Doug

**Worked for more than 160 Hours:** No

**Contribution to Project:**

E2020 outcome leader (innovation). Will lead the Innovation Outcome Expert Group. University Professor in Electrical and Computer Engineering.

**Name:** Kaleita, Amy

**Worked for more than 160 Hours:** No

**Contribution to Project:**

E2020 outcome leader (global awareness). Will lead the Global Awareness Outcome Expert Group. Associate Professor in Agricultural and Biosystems Engineering.

**Name:** Rehmann, Chris

**Worked for more than 160 Hours:** No

**Contribution to Project:**

E2020 outcome leader (systems thinking). Will lead the Systems Thinking Outcome Expert Group. Professor in Civil, Construction, and Environmental Engineering.

**Name:** Rollins, Derrick

**Worked for more than 160 Hours:** No

**Contribution to Project:**

Assistant Dean for Diversity and Professor in Chemical and Biological Engineering. Member of the E2020 scholarship selection committee.

**Research Experience for Undergraduates****Organizational Partners****Sandy Jennings-Hammond**

The project uses the services of the outside individual as a communications specialist for selected project needs.

**3M**

The 3M Corporation has financially supported the Engineering Leadership Program, which is the program after which the E2020 Scholars Program is being modeled. 3M wrote a letter of support for the grant and remains interested the project.

**Rockwell Collins**

Rockwell Collins has financially supported the Engineering Leadership Program, which is the program after which the E2020 Scholars Program is being modeled. Rockwell Collins wrote a letter of support for the grant and remains interested the project.

**Other Collaborators or Contacts**

Engineering Communications and Marketing staff: Designed and developed an E2020 scholarship marketing scheme and website, and created the online application process and portals for students. Also provided technical support to the Scholarship Group for applications and score cards. Also advised on the social networking options to be used for the E2020 cohort.

Learning Communities Task Team (advising staff and faculty from each department): Will participate as members of the outcome expert groups in the four developmental areas of the project.

Student Learning Task Force (faculty from each department): Will participate as members of the outcome expert groups in the four developmental areas of the project.

**Activities and Findings**

**Research and Education Activities:** (See PDF version submitted by PI at the end of the report)

**Findings:** (See PDF version submitted by PI at the end of the report)

**Training and Development:**

Information has been shared across groups in the project, leading to expanding the awareness and knowledge base of every team member in

some way.

The undergraduate peer mentor has been introduced to the NAE's vision for the engineer of 2020.

**Outreach Activities:**

Refer to Activities attachment.

**Journal Publications**

**Books or Other One-time Publications**

**Web/Internet Site**

**URL(s):**

<http://www.engineering.iastate.edu/e2020>

**Description:**

This served as the E2020 scholarship website during the first year, and is transitioning into a broader E2020 program website for the second year.

**Other Specific Products**

**Contributions**

**Contributions within Discipline:**

**Contributions to Other Disciplines:**

**Contributions to Human Resource Development:**

**Contributions to Resources for Research and Education:**

**Contributions Beyond Science and Engineering:**

**Conference Proceedings**

**Special Requirements**

**Special reporting requirements:** None

**Change in Objectives or Scope:** None

**Animal, Human Subjects, Biohazards:** None

**Categories for which nothing is reported:**

Any Journal

Any Book

Any Product

Contributions: To Any within Discipline

Contributions: To Any Other Disciplines

Contributions: To Any Human Resource Development  
Contributions: To Any Resources for Research and Education  
Contributions: To Any Beyond Science and Engineering  
Any Conference

# Annual Report for Year 1

## E2020 Scholars

### NSF S-STEM Program

#### Award #0807051



## Activities

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### Project Goals and Objectives

The E2020 Scholars Program offers scholarships for cohorts of undergraduate engineering students within the college's established learning community infrastructure, giving specific attention to the aspirations and attributes of the National Academy of Engineering's (NAE) vision for the engineer of 2020. The project has outlined a set of student development and learning opportunities consistent with this vision to be integrated into curricular and co-curricular activities: leadership development, global awareness and understanding, systems-thinking, and innovation. The scholarship program will promote student engagement and development centered on these E2020 outcomes.

The E2020 Scholars Program is pursuing the goals of the S-STEM program through four objectives:

- Provide opportunities of the Engineering Leadership Program to greater numbers of students and create learning outcomes consistent with the E2020 vision.
- Engage students in new learning opportunities through cohorts and communities focusing on E2020 concepts.
- Involve greater numbers of students in the Engineering Leadership Program and use E2020 scholarships in coordination with new programs being developed in a related NSF STEP grant.
- Use the E2020 focus in coordination with the NSF STEP grant to prepare more graduates to fulfill the NAE and college vision.

The objectives of the E2020 Scholars Program will be achieved by leveraging two highly successful programs in the College of Engineering: the Engineering Scholarship Program and the Engineering Leadership Program. In addition, the opportunities for students will be enhanced by offering new learning experiences based on the E2020 vision. The program will benefit from the application of successful, research-based practices, alignment with national recommendations, institutional and team strengths, and expert evaluation.

The program proposed to select 25 scholars during year one for students entering Fall 2009, split approximately evenly between incoming freshmen students and transfer students.

## Project Management and Communications

- The project team held meetings twice monthly to plan, review strategies and progress, and share information.
- Five subgroups were formed to manage project activities: Scholarships Group, Community Group, Curriculum/Assessment Group, ELP Group, and Evaluation Group. Project PI's serve as leaders of these groups, and collaborators and active stakeholders have been identified as needed to facilitate the work of each group.
  - During Fall 2008, group leaders completed a set of planning worksheets that summarize actions, strategies, and expected results for each subgroup. These worksheets will continue serve as a reference for the team.
- Active stakeholders in the project include engineering faculty and staff in the Engineering Diversity Affairs office, the Learning Communities Task Team, and the Student Learning Task Force. Presentations have been made to these stakeholders, and some members have been (or will soon be) directly involved in project activities.
- A Sharepoint intranet site is used as a tool to maintain and share project information, such as meeting minutes, documents, readings, curriculum materials, scholarship applications, etc.
- Updates to the E2020 Scholars program web pages are in progress. The goal of this activity is to create more comprehensive and user-friendly web pages for those seeking information about the program and for those applying to the program. The initial web pages were developed to advertise the scholarships to prospective students. <http://www.engineering.iastate.edu/e2020>
- 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.
- The E2020 Scholars Program is being managed in coordination with an NSF STEP-funded project, SEEC: <http://www.eng.iastate.edu/seec/>. The SEEC project objectives will enhance the programs and services available to students receiving E2020 scholarships, especially transfer students. All but a few E2020 team members are also SEEC team members.

## Scholarships

- Program and COE student affairs staff shared information about the program and scholarships at various COE recruitment events throughout the year.
- The project team reviewed the ELP scholarship award model and agreed on the details of the scholarship awards for the E2020 program.
- The Scholarships Group set the selection criteria in preparation to recruit the first cohort of E2020 scholars.
  - Students must demonstrate financial need as determined by filing the FAFSA.

- Students must be US citizens.
- Students must be accepted for admission.
- Students must complete an online application that includes one recommendation from a teacher, counselor, employer or other professional who can attest to the student's potential including leadership and work ethic.
- Students must possess the potential to succeed. Demonstrated academic ability should include the following:
  - First year students
    - 3.0 GPA on a 4.0 scale
    - Top 30% class rank
    - ACT sub-scores for Math-24 or Higher; SAT 1 math above 560
  - Transfer students
    - 24 transferrable hours or meet first year student criteria
    - 3.00 GPA on 4.0 scale
- A marketing plan was developed to educate potential students about the E2020 opportunity and elicit a strong and diverse application pool.
  - Designed a postcard to market the program to prospective first year and transfer students.
    - Mailed to all first year and transfer prospective students
    - Mailed to high school counselors and community college counselors
    - Handed out at outreach events for the College of Engineering
  - Designed a website to serve as an online marketing and outreach tool for the program.
    - Portal for students to submit applications
    - Generated a PDF application and scorecard for each applicant
- An online application form requested personal information, academic information, extracurricular activities, and essays. The essay questions were:
  - I wish to be considered for an E2020 scholarship because...
  - Given the challenges we face as a nation (see the COE 2050 Challenge and the NAE Grand Challenges) and considering the focus of the E2020 Scholars Program, some ideas that I would like to act upon as an engineer include...
- A selection committee conducted a review process and made final decisions on students selected as E2020 Scholars for the fall 2009 entry year. The committee of seven included two faculty/administrators, three student affairs staff, and two students. The committee itself represented a diverse group, having four women, two Latino/Hispanic, and one African American member. Every application was reviewed by several committee members. The committee met, discussed and iterated on the top applicants based on scores and other attributes to arrive at a finalist list and alternate list.
- Offers were made from the finalist list. Several alternates were offered, after students withdrew application for admission by the nationally recognized May 1 deadline.
- Demographic data are available on all applicants and new scholars. These are summarized in the Findings of this report.



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

## **Cohort and Community Development**

- Community Group leaders met regularly with the Learning Communities Task Team to involve them in early discussions about the project and scholar participation in learning communities.
- A peer mentor for the cohort and E2020 Learning Community was recruited and hired during Spring 2009. Additional peer mentors will be hired during year two.
- The E2020 Learning Community will begin to offer programming to scholars in the second semester of their first year. Cohort activities will be informal during their first year. Students will actively participate in a COE (or related) learning community during their first year. Programming differences between first year and transfer cohorts continue to be discussed.
- A scholar/parent introductory meeting about the E2020 program was scheduled during each summer orientation session. Topics included:
  - Social networking during summer to develop relationships between cohort members and faculty/staff involved with program
  - Programmatic goals of program and what to expect
  - Student input for educational and social programming
  - Introduction to the E2020 peer mentor, who will be providing peer support for cohort members and assisting with program development and implementation
- A social networking site for scholars and the project team was set up, <https://e2020scholars.groupsite.com>.
- Program staff met with all incoming first year students during summer orientation and invited them to register on the social networking site. Transfer students did not attend orientation, so alternative meetings will be arranged.
- Planning for the fall new scholar kickoff meeting has begun.
- Various organizational tasks to develop and support programming for the cohort and community are underway.

## **Curriculum and Assessment**

- First-year courses and learning communities will incorporate introductory learning modules emphasizing selected outcomes from the NAE's vision for the engineer of 2020. Planning is underway to provide student learning experiences in the four E2020 outcome areas:
  - Leadership Development, including teamwork, communication, and service
  - Global Awareness and Understanding, including cultural adaptability
  - Systems-thinking, including interdisciplinary engineering design

- Innovation, including creativity and entrepreneurship
- 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.
- For each outcome, an Outcome Expert Group (OEG) is being formed. So far, the faculty leader of each OEG has been identified. In addition to the faculty leader, each group will consist of faculty collaborator(s), member(s) of the Student Learning Task Force, and member(s) of the Learning Communities Task Team. This structure ensures key linkages that will benefit the project and related college activities.
  - Early in year two, each OEG will define a competency-based learning model similar to the ELP leadership model involving outcomes, competencies, and actions.
  - During their first year, E2020 Scholars will be introduced to E2020 outcomes through learning community programming, along with other learning community students. During their second year, E2020 Scholars will gain a deeper understanding of E2020 outcomes. Identifying, creating, and assessing these student learning experiences will be coordinated through the OEGs.
  - OEG members bring expertise needed to define, integrate, and assess the outcomes and learning experiences.
- At the 2008 ASEE/IEEE Frontiers in Education Conference, the PI attended presentations related to first-year curriculum and the E2020 outcomes, 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.)

## Evaluation

- Evaluation during year one has consisted primarily of working with other team members to establish criteria for more detailed subsequent data-driven evaluation efforts. The emphasis has been on criteria and mechanisms for attracting, recruiting, and enrolling students supported by the E2020 project. Insufficient data exist at this point to conduct a meaningful analysis of student outcomes. However, a process evaluation is possible based on participation in E2020 meetings and in related meetings, including Iowa State University's NSF-funded SEEC (STEM

Student Enrollment and Engagement through Connections) project and the Engineering Leadership Program.

- Interactions with the PI and co-PIs for E2020 make it clear that planning for future project implementation has proceeded well. Members of the E2020 groups have cooperated well and valuable linkages have been established with other E2020 groups through meetings among the project's leaders.

# Annual Report for Year 1

## E2020 Scholars

### NSF S-STEM Program

#### Award #0807051



## Findings, Products, and Contributions

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The activities of the project led to several results and outputs during year one. These are highlighted below.

### **E2020 Scholars Program Visual Identity**

A logo for the E2020 Scholars Program was created by a graphic designer from Engineering Communications and Marketing. Each of the E2020 outcome areas is depicted by a graphical icon.



- Star: leadership
- Arrow: System thinking
- Exclamation: Innovation
- Circle: Global awareness

Features of the program are captured in the symbology of the graphical design elements: going outside the box represents breaking barriers, while the circle inside the box means keeping the world safe; imperfect squares represent that each student is unique, and there are different paths; and the shading variations represent depth in student development.

The logo has been used in program communications, giving the program and scholars a distinctive visual identity.

### **E2020 Scholars**

As part of the scholar application review process, a formal application database was developed and merged with the ISU financial aid database for demonstrated financial need. This database was extensively utilized for review of applicants throughout the selection process. The database is maintained by support staff for the E2020 program.

Here are the results of the application and selection processes:

- Total number of applicants
  - First year students: 189
    - Men: 137
    - Women: 52
    - Ethnic minority: 28
  - Transfer students: 19
    - Men: 18
    - Women: 1
    - Ethnic minority: 1
- Number of scholars: 22
  - First year cohort: 15
    - 4 women
    - 5 ethnic minority (including 1 woman)
  - Transfer cohort: 7
    - All Caucasian men

<b>Last Name</b>	<b>First Name</b>	<b>Home State</b>	<b>Major (LC)</b>	<b>Transfer Institution</b>
<b>First Year Cohort</b>				
Bomett	Moses	IA	ENGR (LEAD)	
Carr	Alexander	CO	Aer E	
DeLoatch	Sterling	IL	Cpr E	
Escher	Anthony	IA	ME	
Fleege	Alicia	WI	ENGR (Honors)	
Jimenez	Lizette	IL	Ch E	
Klutzke	Brenda	MN	M E (WISE)	
Kruger	Samuel	IA	C E	
Lyon	Todd	IA	Cpr E	
Magstadt	Benjamin	NE	E E	
Morgan	Donathan	MO	E E	
Page	Ryan	IA	I E	
Rager	Karly	SD	CE	
Rondon	Andrew	KS	C E	
Wenger	Justin	IA	Con E	
<b>Transfer Cohort</b>				
Flaherty	Patrick	IA	ME	Iowa Central CC
Jolley	Christopher	IA	CE	Hawkeye CC/Salt Lake CC
King	John	IA	Ch E	Kirkwood CC, Iowa Western CC
McGuire	Ethan	IA	Ch E	Southwestern CC
Schulte	Eric	IA	C E	Hawkeye CC
Smith	Jeffrey	NE	Aer E	Univ. of Nebraska
Titus	Mathew	IA	M E	DMAcc

Each scholar must participate in a first year learning community (LC). The LC is shown in the table above in the column with the major. If no LC is shown, the LC in the major is implied.

The relatively small size of the transfer applicant pool led to the difference in cohort sizes and also to the lack of diversity of the transfer cohort. The first year applicant pool was both strong and diverse. The selection committee and project team decided to take advantage of the first year pool and begin with a larger first year cohort. The transfer cohort is large enough to form a cohesive group and to seed the transfer programming for the Scholars Program. The Scholarships Group will improve the marketing to community colleges in year two to develop a larger and more diverse transfer applicant pool.

### **Summer Orientation Meeting for E2020 Scholars**

New students attended summer orientation during June 2009, and scholars (and their parents) had the opportunity to meet individually or in small groups with E2020 staff. The following handout was provided.

#### **E2020 Scholars Programming**

Social Network website <https://e2020scholars.groupsie.com/>

#### **E2020 Learning Community**

- Informal and active participant in learning community
- Academic and social activities
- Peer mentors
- Special experiences – Keep track via portfolios (eDoc)

#### **Examples of Leadership**

- Engineering Leadership Program [www.eng.iastate.edu/leadership](http://www.eng.iastate.edu/leadership)
- Team projects – Solar Decathlon, solar car, cement canoe, dance marathon
  - Engineers for a Sustainable World (Project CE/388X) - <http://www.stuorg.iastate.edu/esw/>
- Engineers without Borders - <http://www.ewb-usa.org/>
- Student Orgs. within the college: <http://www.eng.iastate.edu/prospective/clubs.asp>  
<http://www.eng.iastate.edu/esc/>  
<http://www.eng.iastate.edu/flie/>  
<http://www.stuorg.iastate.edu/wise/>  
<http://www.eng.iastate.edu/swe/>  
<http://www.stuorg.iastate.edu/dbia/>  
<http://www.stuorg.iastate.edu/nsbe/>  
<http://iowaalpha.tbp.org/>

#### **Innovation**

- Entrepreneurial Studies Minor - <http://www.eng.iastate.edu/entrepreneur/>  
<http://www.business.iastate.edu/undergraduate/minors/entrepreneurship/>
- Undergraduate Research Experiences – [www.engineering.iastate.edu/peruse](http://www.engineering.iastate.edu/peruse)
- HCI REU - <http://www.hci.iastate.edu/REU09/bin/view>

#### **Systems Thinking**

- Bioengineering minor - <http://www.eng.iastate.edu/bioengineering/>
- Innovate article - <http://www.eng.iastate.edu/bioengineering/BioengineeringMinor.pdf>

- Design competition – Solar decathlon house; solar car; concrete canoe; steel bridge; Formula 1 car; Baja car
- MIS 437. Project Management. (3-0) Cr. 3. Equips students to support team activities in the general project management environment and better manage their careers. Practical experience using project management techniques and tools. Course topics include project initiation and execution, risk assessment, estimating and contracts, planning, human factors, and standard methods. Non-major graduate credit.  
<http://www.bus.iastate.edu/amt/MIS437.asp>  
<http://multidesign.engineering.iastate.edu/>  
<http://www.engineering.iastate.edu/news/news-article/article/2515/5828.html>

#### **Global awareness**

- Globalization course - <http://www3.me.iastate.edu/me484/>
- **C E 388. Sustainable Engineering and International Development.** Multi-disciplinary approach to sustainable engineering and international development, sustainable development, appropriate design and engineering, feasibility analysis, international aid, business development, philosophy and politics of technology, and ethics in engineering. Engineering-based projects from problem formulation through implementation. Interactions with partner community organizations or international partners such as nongovernment organizations (NGOs). Course readings, final project/design report.
- Engineers for a Sustainable World (Project CE/388X) - <http://www.stuorg.iastate.edu/esw/>
- Engineers without Borders - <http://www.ewb-usa.org/>

### **E2020 Scholars Social Networking Site**

A social networking site is being used to increase networking and communication among the scholars and the advisors. It has a discussion section where conversations can be held, a calendar that can keep everyone up-to-date about events happening in the program and the College of Engineering, blogging capabilities, a File Cabinet where announcements and handouts can be uploaded, a photo gallery to post E2020 event pictures, and links to other important sites. Everyone has a social and professional profile and member objectives. The profile questions can be edited and changed to customize information about the scholars. The discussion board can be used as a way to communicate with each other as well as post news bits or web links to be discussed that are pertinent to the goals of the program. The member objectives can be filled out to see what each scholar's goals are for the program and college in general each semester. Along with these, the website can be edited to have a custom appearance, it is private, and people register by invitation only. More web pages can be added. The website keeps track of the demographics and statistics of members and activity. Sub-groups can be added to the main group, and in time there can be sub-groups for each cohort of scholars. The URL is <http://e2020scholars.groupsite.com>, and the site is part of the Groupsite Pro package.

## E2020 Scholars Program News Articles

College of Engineering E-News, "Diversity recruitment efforts paying off," May 13, 2009, <http://www.eng.iastate.edu/enews/2009/2009-05-13.html>.

College of Engineering Alumni E-News, "Diversity recruitment efforts paying off," May 2009 [http://www.eng.iastate.edu/enews\\_alumni/2009/05-May.html](http://www.eng.iastate.edu/enews_alumni/2009/05-May.html).

"Future Iowa State engineering students awarded Gates Millennium Scholarships," COE In The News, May 19, 2009, <http://www.engineering.iastate.edu/news/news-article/article/2561/2403/1246384240.html>

## E2020 Scholar Press Release

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*FOR IMMEDIATE RELEASE*

### **[Student's first and last name] Awarded E2020 Scholarship**

*City, State (Month, Day 2009)* [Student's first and last name] will be attending Iowa State University's College of Engineering this fall as a member of the E2020 Scholars Program. In addition to receiving a \$2,500 scholarship award, renewable up to four years, [student's last name] will join 18 fellow incoming E2020 Scholars in the E2020 Learning Community. "This program builds off of ISU's nationally ranked Learning Community program," describes Dr. Steven K. Mickelson, Director, Center for Excellence in Learning and Teaching, Co-Director, ISU Learning Communities, and Associate Chair, Agricultural and Biosystems Engineering Department. "The E2020 Learning Community will focus on understanding and developing attributes in the areas of leadership development, global awareness and understanding, orientation to systems thinking, and innovative and entrepreneurial aptitudes. These attributes are expected to characterize the engineer of 2020."

This exemplary group of students will work on real engineering challenges facing our world today – and those that will be faced in the future – as they build their skills. For example, an E2020 Scholar may become an undergraduate research assistant and work on a bioengineering project seeking polymers suitable for self-regulating systems for drug delivery. He/she may choose a leadership role with the ISU PrISUm solar car team to develop innovative solutions for renewable energy. Or, he/she may find that an internship abroad provides opportunity to help develop sustainable agriculture systems. Many of the problems posed by the College of Engineering's 2050 Challenge, such as providing modern healthcare, renewable, nonpolluting energy, and abundant clean water to all parts of the world, will be tackled by E2020 Scholars.

The E2020 Scholars Program and corresponding E2020 Scholarships are made possible by a grant from the National Science Foundation (NSF). The NSF is investing in the future workforce needs of America in



science, technology, engineering, and mathematics (STEM). “Scholarships are vital to bringing students into STEM fields of study and broadening participation in engineering,” explains Dr. Diane Rover, Associate Dean for Academic and Student Affairs and Professor, Electrical and Computer Engineering. “The E2020 Scholarship recognizes not only the academic accomplishments of the scholars, but also the vision these scholars have for creating a better world and meeting the 2050 Challenge set forth by the College of Engineering. Each scholar brings unique experiences and talents, and collectively, they represent the promise of engineering to society.”

### CONTACT INFO

Monica Bruning

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## **Evaluation Findings**

At this formative stage of evaluation, meaningful measurement and analysis is not yet possible for the four S-STEM program goals that were articulated for E2020:

1. Improved educational opportunities for students: What is the effect of ELP related programming and enhancements for the E2020 Scholarship Program? To what extent do students demonstrate progress on E2020 learning outcomes?
2. Increased retention of students to degree achievement: Do scholarship support, E2020 relevance to students, and learning community engagement increase retention?
3. Improved student support programs at institutions of higher education: What is the benefit of extending ELP to greater numbers of students and of complementary NSF STEP grant activities?
4. Increased numbers of well-educated and skilled employees in technical areas of national need: What is the result of the E2020 focus and the concurrent goal of the NSF STEP grant to increase the number of engineering graduates?

However, process evaluation at this stage can address some key questions regarding project effectiveness.

a) Regarding accountability:

- Did the project team do what it said it was going to do?
  - Yes. Members of the E2020 leadership team have met regularly and have conducted productive meetings. Good channels of communication have been worked out among academic, administrative, and student affairs professionals.

- Were the activities related to the goals and objectives of the project actually completed?
    - Although little hard data exist at the end of Year 1 relevant to the four program goals, generally progress has been made toward meeting these goals.
- b) Regarding effectiveness:
- How well did the activities meet the objectives of the project?
    - It is too early to have hard measures of student outcomes, but the organization of E2020 staff into functional teams has led to concrete activities that establish the preconditions for later measures of student success.
  - Were the objectives accomplished, in light of the attitudes, opinions, and knowledge of the participants?
    - Discussions with E2020 leaders make it clear that they believe progress is being made toward accomplishing the objectives of E2020.
- c) Regarding impact:
- What changes have occurred as a result of the project?
    - Functional teams have been established, and activities undertaken by these groups are designed to contribute to larger numbers of student recruited into engineering.
    - Information regarding funding opportunities has been disseminated more widely to high school students, and efforts among College of Engineering student recruitment and student affairs staff appear to have become better coordinated.
  - How are these changes related to the stated expected outcomes of the project?
    - Measurable student outcomes are not yet available, but structural and functional changes are directed toward achieving those outcomes.
  - How have individual and group attitudes been changed?
    - Coordination among the SEEC, E2020, and Engineering Leadership programs is particularly evident.
  - How have individual and group behavior been affected?
    - More regular meetings among relevant program staff have been held under the auspices of E2020, and communications external to those meetings appear to occurring with greater frequency.
  - What forms of institutional change have occurred?
    - The most readily evident change is the frequent interactions among otherwise separate student affairs units.
- d) Regarding organizational context:
- Which structures, policies, or events affected the project?
    - Based on discussions with E2020 leadership and examination of meeting minutes and related documents, the direction taken by the program has been impacted by the challenging university budget situation and responsiveness to the national and state workforce development need to increase and diversify the number of students majoring in engineering and in STEM disciplines generally.
  - What helped to achieve the goals and objectives of the project?

- Positive attitudes of cooperation and shared purpose among E2020 leaders have been the primary reason for progress toward achieving the goals of the project.
  - What made it difficult to achieve project goals and objectives?
    - Achievement of goals has been as yet difficult to measure owing to the lack of hard data at this point related to the recruiting class of 2009. Financial resource limitations under the E2020 grant and commitment of staff and administrators to multiple other projects have imposed some barriers.
- e) Regarding unanticipated outcomes:
- What happened that was not planned for or expected?
    - Leadership changes within the College of Engineering associated with the hiring of a new Dean may be associated with future uncertainties, with unknown possible consequences for the program.