Program for Women in Science and Engineering
Iowa State University

2011 Program Review
Self Study Report

March 2011
# Program for Women in Science and Engineering
## 2011 Self Study

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I. PROGRAM REVIEW PURPOSE AND PROCESS

Purpose of Program Review

In 1990 the Iowa Board of Regents instituted a policy requiring a program review for academic programs in the three Regent’s universities at least every seven years. Although this mandate specifically addressed academic programs, Iowa State University has decided to apply the same process to other administrative and service units. The program review is made up of three phases: the self-study, the external review, and the development of a plan based on the first two phases.

The Program for Women in Science and Engineering (PWSE) is entering the last year of 5-year strategic plan. Iowa State University has just released a new five-year strategic plan. This program review process will inform the PWSE Advisory Board and staff as they work to develop the next PWSE strategic plan.

Purpose of the Self-Study and External Review

The staff members of the Program for Women in Science and Engineering (PWSE) and the PWSE Advisory Board:

1. strive for excellence in programming to accomplish the mission of PWSE and
2. believe that excellence is achieved through continuous reflection and assessment.

This self-study is therefore viewed as an opportunity to reflect on the current program status and envision where the program is going. The PWSE Advisory Board and PWSE Staff hope through the self-study and external review process to answer the following broad questions:

1) What progress has been made by PWSE on issues raised in the last program review?
2) What impact is PWSE having on the University mission and strategic plan?
3) What success/progress has PWSE made on its 2007-2012 Strategic Plan?
4) How well does PWSE meet the needs of pre-college and undergraduate STEM students?
5) Is PWSE efficiently prioritizing the use of its resources? Does PWSE have the necessary resources to meet expectations today and in the future?
6) What impact is PWSE having on Iowa?
7) Is the PWSE Advisory Board effectively supporting the needs of the program?
8) How does PWSE compare to programs at peer institutions?
9) How can the University more effectively support PWSE?

External Review

On March 31, and April 1, 2011, an external review team will visit Iowa State to assess PWSE and provide feedback to the program on the above questions. The team will be comprised of distinguished professionals dedicated to advancing women and diversity in STEM. All three team members have previously served as president of the national organization WEPAN (Women in Engineering Proactive Network). The review team members will include:
• Team Chair, Beth Holloway, Director, Women in Engineering Program, Purdue University
• Tricia Berry, Director, Women in Engineering Program, University of Texas-Austin
• Bevlee Watford, Director, Center for Enhancement of Engineering Diversity and Interim Department Head, Engineering Education, Virginia Tech
II. OVERVIEW OF THE PWSE

History of Program
The Program for Women in Science and Engineering was formed in 1986, from a grass-root effort of faculty/staff on the ISU campus to address the issue of the under-representation of women in science and engineering. Initially started as a volunteer effort of faculty/staff as part of the University Committee on Women, the program was transformed into a university program under the leadership of Dr. Mary Ann Evans, with the support of then Vice-President George C. Christensen. PWSE has had only two directors in its 25-year history: Dr. Evans served as program director from the program’s beginning until 2002, when Dr. Karen Zunkel took over leadership for the program.

Programs administered by PWSE have varied over the years, based on funding and priorities of the institution. PWSE has offered programs for women faculty, staff, graduate and undergraduate students in STEM. In the outreach area, programs have been offered for both students and educators. Current programming efforts are focused on outreach, recruitment, and retention of undergraduate women in science, technology, engineering and math (STEM) disciplines.

The program has always been a centrally administrated academic program, reporting to the Office of the Executive Vice President and Provost. PWSE supports students in 62 STEM majors in four academic colleges: College of Agriculture and Life Sciences, College of Engineering, College of Human Sciences, and College of Liberal Arts and Sciences. A complete list of the undergraduate majors supported by PWSE is included as Appendix 1.

PWSE Mission and Strategic Plan

Development

In 2007, PWSE developed a five-year strategic plan through a collaborative process with PWSE staff members and the PWSE Advisory Board members. The plan set out the vision, mission, culture, core values, and strategic priorities for PWSE to pursue over the 2007-2012 timeframe. The mission statement and strategic priorities are outlined below. The one-page PWSE Strategic Plan is included as Appendix 2.

Mission:
Create programs, share knowledge, and engage people to enhance the STEM educational experience for women.

Create, offer, and maintain innovative undergraduate and outreach programs that engage a diverse audience of women and girls in an experiential and supportive learning environment in STEM.

Share knowledge on innovative strategies, best practices, and research on the success of women in STEM with a broad range of individuals and organizations serving as partners in transforming the STEM educational experience for women.

Engage a broader, more diverse group of women pursuing STEM careers.
Priorities:
1. Expand partnerships with individuals and organizations to increase the impact of PWSE programs and initiatives.
2. Broaden the participation in PWSE programs and initiatives.
3. Improve quality and effectiveness of PWSE programs through continuous assessment.
4. Serve as a knowledge resource on issues and programming related to women in STEM.
5. Create a presence and awareness of PWSE and the issues associated with women in STEM fields.

Translating strategic plan into action

In addition to developing the strategic plan, PWSE staff and advisory board developed a tactical plan (Appendix 3) that included specific strategies and timeline to implement the five priorities. Annually, and sometime twice a year, PWSE staff and advisory board members would review progress made on the priorities. Through this on-going assessment process, the implementation of specific strategies evolved over the course of the five years based on success of initiatives, staff time and resources, and changes in other conditions/external factors. Although the specific strategies employed may have evolved, the five key priorities have remained consistent. Recent decisions associated with prioritization of staff time, allocation of financial resources, and program development/discontinuations have been guided by the strategic plan.

Relation to University Mission and Strategic Plan

PWSE is strategically aligned with several aspects of the Iowa State mission, strategic plan and presidential initiatives. Iowa State University is officially known as Iowa State University of Science and Technology. Since PWSE is focused on science and technology fields, the efforts of PWSE are directly in-line with the primary focus of the institution. There are several common themes that run through both the 2005-2010 strategic plan (that was in place most of the time since the last PWSE review) and the 2010-2016 strategic plan (that was just recently approved). PWSE’s mission and activities are directly supportive of the following items addressed in the university’s 2010-2016 strategic plan:

- “land-grant ideals… should be accessible for all regardless of race, gender, or economic circumstance”
- “Iowa State will be a magnet for attracting outstanding students who seek an education that prepares them to make a difference in the world”
- Goal – “Recruit, support, retain and graduate a diverse group of outstanding undergraduate, graduate, and professional students dedicated to making a difference in the world”
- Goal – “… build on Iowa State’s strength and excellence in science and technology…”
- Goal – “… high quality student life that engages and challenges students to collaboratively learn, grow and succeed…”

Since women remain under-represented within science and engineering fields, programming such as PWSE’s efforts to increase the representation of women is directly addressing the diversity issue within these disciplines. One of the strategies used by PWSE to increase the retention and graduation rates of
women students is through the active engagement and involvement of women students (through learning communities, enhanced interactions with faculty, etc.). These opportunities not only increase the graduation rate of women in engineering and science, they also enhance the educational experience.

**Organizational Structure and Staffing**

The Program for Women in Science and Engineering is located within the Office of the Executive Vice President and Provost. The Director of PWSE reports to the Associate Provost for Academic Programs, David K. Holger. The PWSE staff consists of three budgeted staff members. In addition the program utilizes approximately 50 student employees and over 100 volunteers to provide programming for women.

**Director of PWSE:** Dr. Karen Zunkel serves as the current director of the Program for Women in Science and Engineering. She is a full-time professional and scientific staff member. Karen has a split appointment and spends about ½-time on her position as Director of PWSE. The other half of Karen’s position is supporting undergraduate academic programs within the Office of the Executive Vice President and Provost. This split appointment was initially anticipated to be ¾-time PWSE and ¼ time provost; however, over time the actual responsibilities have shifted to about half and half.

**On-Campus Coordinator:** Lora Leigh Chrystal serves as the on-campus coordinator and functional assistant director for PWSE. She is a full-time professional and scientific staff member. Lora Leigh is responsible for coordinating the programming aimed at increasing the retention and graduation rates of women enrolled in STEM disciplines at Iowa State. She is responsible for the WiSE learning communities, scholarship programs, the second-year program and course, and transfer student programming. She also serves as advisor for the WiSE student organization and as backup for the director in handling much of the day-to-day operational issues of the PWSE office, including the PWSE website. She also represents PWSE on the university-wide Learning Community Advisory Committee. Lora Leigh has one graduate assistant, six peer mentors, and two undergraduate program/office assistants that work with her in these various program areas.

**Outreach Coordinator:** Carol Beaverlo serves as the outreach coordinator for the program. She is a full-time professional and scientific staff member. She has responsibility for the Taking the Road Less Traveled Career Conferences, the Student Role Model Program, the PWSE Ambassadors and various collaborative outreach initiatives. Carol serves on several internal and external committees focused on K-12 STEM issues. She has three undergraduate program staff assistants that work with her on the outreach programs.

**Support position:** PWSE used to have a 5/8-time secretary II to provide office/program support. However, the person in that position retired in December 2009 and PWSE has not been allowed to refill that position due to budget constraints. To compensate for the loss of this position, four different staff members in the Office of the Executive Vice President and Provost are providing some support. It is estimated between these individuals that PWSE is receiving about 30% of a support position. In addition the other PWSE professional staff members and student workers have picked up the remaining responsibilities.
Student Staff: PWSE currently employs one graduate assistant and several undergraduate student staff members that provide programming support and coordination. In addition to providing critical programming support, the employees develop leadership and other skills as part of their work experience. Current student staff responsibilities are as follows:

- Annie Olson – senior in mathematics - Student Role Model Program Assistant – coordinates the 24 undergraduate students who are paid to go out to schools and community organizations to do hands-on activities with K-12 youth. Also supervises Emily Junge – sophomore in mathematics – who assists in preparing kits/curriculum materials for visits.
- Katie Gibson – Career Conference Program Assistant – provides logistical and registration support for up to 3000 attendees at six different career exploration conferences held each year.
- Rachel Montesorio and Patrick Hepner – office assistants – provides front desk coverage and office support for various PWSE programs.
- Peer Mentors – 26 undergraduate women serving as the “front-line” for the learning communities, providing programming and one-on-one interaction for the first-year, second-year and transfer learning communities
- Role Models – 30 undergraduate women who visit classrooms, community organizations, and programs across the state of Iowa conducting STEM outreach activities.

Volunteers: Without the support of volunteers and collaborators, many of the PWSE programs would not exist. Well over 100 individuals volunteer each year to serve as speakers at career conferences, help organize the conference days, participating in sessions and panels with undergraduate students, etc. Volunteers include industry representatives, faculty, staff, graduate, and undergraduate students

Staffing History Since last Review:

The staff size for PWSE has fluctuated over the past six years, based primarily on budgetary constraints. Excluding the undergraduate student support staff, the professional, merit and graduate support staff for the past several years is highlighted in the table below.

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<td><strong>Professional Staff # (FTE)</strong></td>
<td>3 (2.5)</td>
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<td>3 (2.75)</td>
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<td><strong>Merit/Support Staff # (FTE)</strong></td>
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<td>3 (1.5)</td>
<td>2 (1.0)</td>
<td>2 (1.0)</td>
<td>1 (0.5)</td>
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<tr>
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<td>6.5 (3.8125)</td>
<td>7 (4.625)</td>
<td>6 (4.125)</td>
<td>6 (4.125)</td>
<td>5 (3.875)</td>
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* The partial support being provided by the EVPP office is not included in this chart, since it is not dedicated/budgeted to PWSE and is being done on an ad hoc (somewhat temporary) basis.
Support staff situation:
When the PWSE support position retired, and with anticipated budget reductions in mind, PWSE had made the decision in December 2009 to shift from two graduate students and a 5/8-time support person to one graduate assistant and a half-time professional staff person. This would amount to a 5/8-time reduction in staff, but would give flexibility in responsibilities and more appropriately fit the ‘level’ of work needed in a support position. However, during the 2010-11 budget development process an administrative decision was made to not allow PWSE to fill the position and to remove the salary and benefits from the PWSE budget as an opportunistic budget cut. To backfill some of the tasks, several members of the staff in the Office of the Executive Vice President and Provost (EVPP) are providing assistance with select support staff functions. The EVPP office and the units reporting to the office are currently engaged in discussions about potential efficiencies to be gained by ‘sharing’ support staff and expertise. The tasks currently under consideration for consolidation are a subset of the tasks done currently for PWSE by
EVPP support staff and an even smaller subset of the tasks formerly performed by the PWSE support staff position. Due to the anticipated timing of any decisions associated with these discussions, and the timing associated with hiring graduate assistants for 2011-12, PWSE has decided to hire two graduate assistants for next year. This will relieve some of the stress on staff next year. However, support will still be provided by EVPP staff for those functions they are currently supporting (which are not appropriate for a graduate assistant position). The PWSE staff and advisory board continue to pursue options associated with hiring a part-time lower-level professional staff member to provide the range of support needed within the office.

**PWSE Advisory Board**

PWSE has a single advisory board composed of external and internal representatives. The membership in the board has varied from 10 to 20 members. Currently there are 14 members on the PWSE Advisory Board. The current list of [PWSE Advisory Board Members](#) is included as Appendix 4 Members are selected to represent the diverse constituencies – industry, K-12, community colleges, various colleges within ISU, and students.

The mission of the PWSE Advisory Board is to support ISU’s Program for Women in Science and Engineering in its efforts to increase the number and success of undergraduate women in STEM. The advisory board typically meets twice a year (for a half-day meeting). The board has evolved to filling three primary roles:

- **Advice:** Providing PWSE staff with advice/guidance on programming directions/priorities from their various constituency bases.
- **Advocacy:** Serving as advocate for the program with ISU Administration and externally, as appropriate.
- **Support/Connections:** Being a link into their respective organizations (for financial support, volunteers, programming collaborations, etc.)

Although the companies of many of the board members are donors to PWSE, there is not a requirement of financial support for board membership. Also, the PWSE advisory board does not serve a significant fundraising role for the organization.

In the past three years, the PWSE Advisory Board has discussed and given input on the following strategic issues:

- The prioritization of program/staff efforts that led to decisions to eliminate programs such as the summer intern and Getaway programs.
- Discussion on programmatic impacts resulting from the K-12 Needs Assessment
- Input into different financial structures/strategies on how to handle the Iowa court ruling to insure continuation of the career conferences
- In-depth discussions of the role of summer intern program, outcomes from program, etc.
- Discussions on the roles alumni can play for PWSE and how to engage this population
- Review of ‘external communications/marketing’ – input on brochures, website revisions, etc.
• Assisted to develop a framework for deciding which of the growing number of potential collaborations PWSE staff should invest their time.
• Raised concerns of the impact of budget/staff cuts on PWSE and the Institution with ISU senior leadership

Partners/Collaborators

Since PWSE consists of a staff of three budgeted positions, not within a particular academic college, the staff members rely heavily on collaborations and partnerships to accomplish the program mission. PWSE collaborates with others at ISU and outside of ISU to achieve its mission. PWSE partners with individuals and groups based on one or more the following criteria (with examples listed below each):

• To expand reach of programming
  – Western Iowa Tech Community College to offer career conferences in Sioux City
  – Other ISU Learning Communities to dual enroll students
  – Delta Academy to engage African-American girls
• To increase efficiency
  – Office of the Registrar and Learning Communities for assessment results for WiSE Learning Communities
  – Office of Admissions for APP/transfer visit days
• To implement changes/new ideas through diversity of ideas and connections
  – Investigating Facebook/Skype via partner input from Extension, ME and IMSE; meetings with Community College faculty; and data from Registrar’s Office
• To influence change beyond PWSE programs
  – Educating Project Lead the Way Teachers on gender issues
  – Developing peer mentor training that impacts College of Engineering mentors
• To create systemic change beyond our program
  – NSF proposal with a faculty member wanting to redesign his design courses to appeal to be more inclusive and appeal more to women
  – Working with departments/centers on “Changing the Conversation” efforts (websites, reports, messages shared, etc.)

A review of partners/collaborators was conducted at the Fall 2009 PWSE Advisory Board meeting. At that time PWSE had identified 17 types of internal partners and 12 types of external partners of the program, for a total of 29 types of partners. (Examples of a “partner type” include ‘academic colleges’, ‘student affairs’, ‘Iowa Department of Education’, and ‘corporations/industry’.) Of these types of partners, 15 were new or significantly expanded partnerships that had been developed since the implementation of the 2007-2012 strategic plan. A listing of these partner types and specific examples of collaborative efforts/activities/purposes is included as Appendix 5.
Resources

Resources to support the program can be divided into four areas. The primary “resource” is the time of staff and volunteers who were mentioned previously. The other three resources are the financial, space and support services.

Financial resources
For the fiscal year 2010-11, PWSE anticipates total budget expenses of $532,697. This compares to actual expenditures of $614,453 in the preceding fiscal year.

Financial support for PWSE comes from a variety of sources. The largest single source is the allocation the unit receives from the university via the General Budget. For the current year (2010-11) this accounts for $277,413 or 52% of the total budget. In addition, PWSE competes for internal (ISU) and external grants; receives gifts from corporations, foundations, and individuals; and charges a nominal fee for participation in some programs. PWSE also has endowed funds within the ISU Foundation that are designated for PWSE programming and scholarships.

On the expenditure side, staff salaries and benefits is the single largest expense category anticipated to be $281,267 (or 53% of the expenses) for 2010-11.

The charts below show categories of revenue sources and expenses for the 2010-2011 budget. Detailed PWSE budget information for 2010-11 and actual revenues and expenses for 2009-10 are provided as Appendix 6 and 7.

Distribution of PWSE Anticipated Revenue Sources 2010-11
Notable financial issues:

**General Fund Budget Cut:** From fiscal year 2009-10 to 2010-11, PWSE saw a 12% budget cut in General Fund support as a result of elimination of the salary and benefits for the support position. This was double the average cut comparable units reporting to the EVPP office saw and was an opportunistic decision.

**Iowa Administrative Ruling:** In 2008 as a result of a review of fees charged public K-12 students, a legal ruling was issued that students may not be charged fees for participation in field trips or activities that occur during a regular school day. PWSE had been charging a fee of $18 for students and chaperones attending the career conferences to cover some of the conference costs. Some schools have always paid the costs for attendance from their budgets, but a significant number had students pay the $18 fee. (PWSE has always provided fee waivers for students eligible for free/reduced lunch.) Under the current ruling, if schools bring students to the conference they would have to cover the registration fees out of their budgets. This had the potential to severely limit access to the conference based on school finances/policies. To adjust for the ruling, PWSE received a $30K increase in state appropriated General Fund budget starting with the 2009-10 school year. PWSE shifted the ‘registration fee’ to a much lower $8 lunch fee (since students can be charged for lunch – with waivers for those students on free/reduced program). The $30K has not completely recouped the lost revenue, but shows a significant commitment allowing the conferences to continue under these new regulations.

**Corporate support – unique situation:** In the 2003-04 year, the president of the ISU Foundation and the president of the university decided that to maximize the dollars raised by the ISU Foundation staff, PWSE would not continue to receive a portion of an ISU Foundation staff member’s time to assist with fundraising and that corporate fundraising should focus on larger gifts, rather than requests of the $5-$20K level that PWSE had been receiving/requesting. PWSE was encouraged to renew support from existing donor relationships; however we were discouraged from approaching new corporate donors. To
offset the potential loss in revenue, the decision was made that PWSE would receive an annual allocation of ISU Foundation funds from the undesignated Greater University Funds for Excellence (GUFE). The amount of funds received from GUFE has varied from approximately $40K to $65K, with PWSE receiving $52,500 for 2010-11. Since the implementation of this strategy, due to shifting priorities and economic times, corporate support for PWSE has dropped from approximately $72K per year to an anticipated $22,500 for this year. PWSE Director, Karen Zunkel held a meeting with the corporate and foundation officers within the ISU Foundation in late February, 2011 to raise the concern of the shrinking corporate support and missed opportunities for corporate support. It appears that compared to our peers, we are ‘leaving a lot of potential revenue’ on the table with potential corporate sponsors who have not been approached about their interest/involvement in supporting PWSE and its mission.

**Space/Physical Resources**

In 2005, PWSE moved into its current 1672 square-feet of office space in 218/208 Carver Hall. There are private offices for the three P&S staff members, cubicles/workstations for up to 6 graduate/undergraduate students, and a front reception desk/work station. In addition PWSE has a small conference room (up to 12 people), a library/work area, copy room area, and a break/storage room. Since most math classes are taught in Carver Hall, the location of PWSE in Carver Hall provides good visibility/access for students.

**Support Services**

As a part of the university community, PWSE has access to a variety of services to support its operation/mission. Some services are free and some are charge a fee based on usage. Most of these are comparable to what programs at other institutions might have. However, there are two areas that are worth addressing, as they relate to previous review issues and areas of concern.

Access to data/information on student success: Iowa State is a ‘college-based’ system and access to many data pieces are automatically generated and shared with colleges. As a central unit that supports multiple colleges, PWSE falls outside the regular processes. Although the data pieces may be stored, they are often not readily accessible for PWSE. Currently to get access to the information needed to track student enrollment, degrees awarded, or get information on prospective students from the Registrar and/or Admission, PWSE must make special requests and pay for downloads of information. The offices are very accommodating; however, the requests are not an automatic free download as received by the colleges. On the positive side, Jonathan Compton, a staff member in the Office of the Registrar, has provided exceptional data analysis on student retention for PWSE as a one-time project. However, PWSE would like to move into a situation where identified data sets and reports are automatically generated.

IT support: PWSE pays for and uses the support services provided by the central IT offices of the university. Over the past several years, due to budget and staffing cuts, the services available to support PWSE have decreased dramatically. An example of this impact is that in 2010 the university upgraded PWSE computers to Office 2007. The Access database (initially created and maintained by central IT staff members) that manages all career conference information does not function under Office 2007. Therefore PWSE is currently running duplicate old version computers to maintain access to this database. PWSE has been told that there is no IT support available to upgrade the data base to be compatible with Office 2007. So, although PWSE is paying for central support, PWSE will likely have to pay additionally to find an external consultant to modify the database.
III. PWSE PROGRAM OFFERINGS

This section includes descriptions of the major programs and initiatives of PWSE. For the major programs, a SWOT (strengths, weaknesses, opportunities, and threats) analysis has been completed by PWSE staff. When appropriate, program outcomes and summary of specific program assessments are also provided. The ability to offer all programs depends on adequate staffing and funding. Potential reductions in staff and funding are not listed individually as a threat to each program, but are mentioned here as threats for all.

PRE-COLLEGE PROGRAMS

Taking the Road Less Traveled Career Conferences

PWSE has been sponsoring Taking the Road Less Traveled career exploration conferences for girls in grades 6-12 each year since 1987. Six conferences are typically offered during each academic year. The conference format includes career information sessions typically led by women working in science, engineering, and other technical fields; hands-on activity sessions; tours of ISU labs and facilities; and special sessions for parents and educators.

In 2009-2010, 2853 students and 324 parents/educators registered for the conference. This brings the total number of participants, since program inception, to 51,930. Demand of the program continues to exceed the conference capacity, which is a function of capacity set by the state fire marshal for the conference location. A sample program is included as Appendix 8.

As a part of every conference, participants provide assessment via a program evaluation. In addition the over the past decade the assessment has been gathered via focus groups with K-12 educators and via the Needs Assessment Project completed by PWSE in 2009.

TRLT Participant Surveys – An estimated 80% of the students who attended the conferences in 2009-10 completed evaluations. Of the students who completed the evaluations:

- 95% reported that the conference was somewhat or definitely helpful in expanding their ideas about career possibilities.
- 83% of the middle school respondents indicated that they were considering a career in science, technology, engineering or math before the conference and 89% of students reported that they were considering a career in science, technology, engineering or math after the conference; while some students may have decided against STEM careers and others were unchanged by the conference, a gain of 6% is
- The percent change for the high school respondents was 2% from 93% considering a STEM career prior to the conference to 95% after participating in the conference.

Educator Feedback (2009-2010 Conference Series) –

- “It’s great to get girls thinking about possibilities early on. I think it’s wonderful to encourage girls to be smart, inquisitive and courageous. This program does that and is a great stepping stone for academic planning! Bravo!”
“It is a good opportunity to learn about career fields that they might know nothing about. Helps rural students get away from home and experience things.”

“Very interesting/informational – helps to educate on the various area of engineering.”

As part of this review process, PWSE staff examined what it perceived to be the expected educator and student outcomes from both adult and 6th-12th grade girls participating in the TRLT conferences. In reviewing the post-conference survey instrument there were noticeable gaps between the data currently being collected and what has identified as expected outcomes. As a result, the survey tool will be revamped to reflect the following identified expected outcomes:

**Expected Outcomes for Parents and Educators:**
- Enhance parental and educator awareness of STEM career opportunities
- Provide additional resources to further increase awareness and student engagement in STEM
- Encourage connection between content knowledge and real world experiences

**Expected Outcomes for 6th-12th grade female participants:**
- Increase interest in STEM
- Increase student engagement in STEM
- Increase confidence through interaction and communication with professional, female role models
- Increase confidence through experiential activities
- Increase awareness of STEM career opportunities
- Reinforce the importance and relevance of science and math courses in middle school and high school
- Increase capacity for understanding the connection between curriculum and real world experiences

**Strengths:**
- Name recognition/demand – program known throughout the state and demand exceeds capacity
- Impacts a high number of students (and an increasingly diverse audience)
- Strong support/engagement from volunteer presenters both on campus and corporate partners
- Assessment demonstrates impact
- Serves as ‘recruiting tool’ – getting students on campus

**Weaknesses:**
- One-day event (although numerous students come multiple times over the years)
- Capacity limited by space/costs
- Geographic limitations for some – they have to come here.
- Lack of support for database limits ability to change conference format easily
- Quality of sessions based on volunteers – some not as interactive/hands-on as desired

**Opportunities:**
- Ability to replicate across the state with adequate funding/support
- Potential donor interest in funding – high visibility/impact
- Increase systemic impact by enhancing programming for teachers/chaperones during the day
- Leverage corporate volunteer time on campus by linking with current students as part of visit
• Explore variations on conference format for 11th and 12th grade participants to increase participation at that grade level, better meet those student needs

Threats:
• Increasing costs for facilities, food and services with no feasible alternatives on campus.
• K-12 funding cuts (lack of support for transportation, willingness to allow teachers to bring students)
• Iowa Court ruling – interpretation and implementation by schools limiting participation
• Starting to see some push-back from on-campus and corporate presenters – in current economic times with lessening support of employers to have employees volunteer to present at the conference.
• Potential complexities and costs associated with risk management/security trends in programs for minors (Could we be required to complete background checks for presenters/tour guides? Supervision level of students within Union, etc.)

Student Role Model Program

The goal of this program is to excite K-12 grade students about science and engineering through their involvement in hands-on activities facilitated by undergraduate science and engineering student role models. Student role models visit classrooms, community organizations, and after-school/summer programs throughout the state. PWSE has experienced rapid growth in the demand and impact of this program in recent years. The chart below shows the number of students reached via the program over the past six years.

<table>
<thead>
<tr>
<th>Academic Year</th>
<th>Number of Students Reached</th>
<th>Number of Female Students</th>
<th>Number of Minority Students</th>
<th>Total Number of Visits</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004/2005</td>
<td>2781</td>
<td>1440</td>
<td>391</td>
<td>59</td>
</tr>
<tr>
<td>2005/2006</td>
<td>3715</td>
<td>1867</td>
<td>636</td>
<td>61</td>
</tr>
<tr>
<td>2006/2007</td>
<td>3842</td>
<td>1960</td>
<td>676</td>
<td>37</td>
</tr>
<tr>
<td>2007/2008</td>
<td>3379</td>
<td>1684</td>
<td>497</td>
<td>69</td>
</tr>
<tr>
<td>2008/2009</td>
<td>6903</td>
<td>3437</td>
<td>1026</td>
<td>118</td>
</tr>
<tr>
<td>2009/2010</td>
<td>5518</td>
<td>2823</td>
<td>1033</td>
<td>109</td>
</tr>
</tbody>
</table>

The Student Role Model program has a long listing of diverse activities it is able to facilitate with K-12 students. Over the past several years, the curricula/activities offered has expanded and been refined to meet the needs and requests of teachers. Teachers either request an activity from a listing of activities on the PWSE website, or work with PWSE staff to develop alternative activities to fit the needs of the classroom. Student Role Models have also served on panels discussing life as a STEM student at Iowa State in high school and community college settings.

The role model program responds to requests from teachers, community organization leaders, etc. When a request comes in from one school, an effort is made to expand the visit beyond just one classroom/class time to reach as many students as feasible during the trip. In addition to requests, PWSE has proactively partnered in a variety of ways to reach out to students of color. There has been grant support to work in
the high minority population districts, such as Des Moines and Marshalltown. In addition for the past two years role models have worked with African-American middle school girls in the Ames area in collaboration with Delta Academy.

The student role models are paid for the time they are working with the K-12 youth, providing some financial support for undergraduate women in science and engineering. Since the role models are visible representatives of ISU and the STEM professions, a concerted effort has been made to ensure diversity is well represented in our role model group. In addition to providing a valuable outreach program, the undergraduate students who serve as role models typically solidify their choice of major, and gain valuable skills and confidence in giving presentations, working with different types of people, leadership, and organizational management.

Student Role Model Assessment:
Since visits are conducted in classrooms across the state, our primary assessment comes from a survey completed by the sponsoring teacher following the Student Role Model Visit. The educators are asked to rate their level of satisfaction with educational content and performance of the role models. This allows PWSE to continually monitor and improve the outreach efforts.

During the 2009-2010 academic year, PWSE Student Role Models went on 109 classroom visits and reached 5,518 students. When asked to rate (using a Likert-type scale from 1-10 where 1=very low and 10= very high) whether the Student Role Models increased awareness about career opportunities in STEM fields, the average overall ranking was 9.5. When asked to rate whether the Role Models increased interest and enthusiasm in science and engineering, the overall result was 9.5.

Sample of Educator Responses:
- “The presenters did an excellent job and the students loved the experience. It's nice to have this program where students see that females can go into science related jobs.”
- “The Role Models were very knowledgeable and explained concepts appropriately and thoroughly. They also related the content to real life, one of the most valuable teaching strategies. I look forward to having them back to present. Thanks so much for everything.”
- “I thought the Role Models did an excellent job discussing their future careers, ISU in general, opportunities in college, and building excitement for college. My students were very interested in what the Role Models had to say.”

As part of this review process, PWSE staff examined what they perceived to be the expected educator and student outcomes after a classroom visit by our student Role Models. In reviewing the post-visit survey instrument that has been used, there are noticeable gaps between the data we are collecting and what are identified as expected outcomes. As a result, the survey tool will be revamped to reflect the following identified expected outcomes:

Expected Outcomes for Educators:
- Enhance educator awareness of STEM career opportunities
- Provide additional resources to further increase awareness and student engagement in STEM
- Encourage connection between content knowledge and real world experiences
Expected Outcomes for classroom/group participants:

- Increase interest in STEM
- Increase student engagement in STEM
- Increase confidence through interaction and communication with undergraduate, female role models pursuing STEM degrees
- Increase confidence through experiential activities
- Increase awareness of STEM career opportunities
- Reinforce the importance and relevance of science and math courses in middle school and high school
- Increase capacity for understanding the connection between curriculum and real world experience

In addition to the impact on K-12 students and teachers, the role model program is viewed as a professional development opportunity for the undergraduate students who serve as role models. In February 2011, PWSE conducted a survey of current role models. Highlights from that survey are provided below:

Undergraduate Quantitative/Qualitative Student Role Model Assessment Information

- 60% of respondents learned to manage their time more effectively
- 86% learned to work more effectively as a team (co-teaching)
- 87% indicated that being a student role model improved their oral communication skills
- 93% indicated that being part of the student role model program increased their CONFIDENCE in public speaking
- 100% indicated that being a student role model enhanced their leadership skills
- 87% indicated that they were very satisfied with their experience as a student role model

When we asked students why they wanted to be a student role model they responded with:

- “I love kids and having the opportunity to talk to them about science and engineering is a great way for me to involve my major into that interest.”
- “I felt like it would be a good experience and wanted to motivate young girls to look into studying science.”
- “I am passionate about engineering and encouraging women to pursue careers in STEM fields.”

Strengths:

- Provides female role models and shares messages with both boys and girls in K-12
- Incorporates undergraduate -- job opportunity/professional growth/leadership
- Strong demand and positive feedback from educators
- Cost effective for schools (and PWSE is increasing impact by visiting multiple classrooms in a visit)
- Easily used by teachers – responsive to teacher curriculum needs, flexible

Weaknesses:

- Availability is limited by student role model class schedules
• Ability to reach far corners of the state is more difficult (and costly)
• Costly program (wages and travel for students)
• While working to expand curriculum – some areas (particularly at high school level) are more limited
• Often is a one-time event in a classroom – what is long-term impact?

Opportunities:
• Expanding partnerships with faculty/staff across campus – to develop new kits/curricula
• Partner with other institutions to replicate and have role models geographically distributed across the state
• Incorporate professionals across the state as part of visits
• Curriculum expansion to meet a broader teacher/curriculum need
• Schedule multiple visits to same classroom/program – to allow K-12 students to develop relationships with role models

Threats:
• Potential complexities and costs associated with risk management/security trends in programs for minors (Could we be required to complete background checks for all role models?)
• Dependent on student role models having schedules that allow them to be off-campus for extended periods of time during regular K-12 class time.
• Dependent on students continuing to be able to drive university vehicles for visits

Outreach Partnerships

In addition to the two key signature programs, PWSE impacts outreach to K-12 via a variety of partnerships and collaborative events. PWSE strategically connects with other organizations associated with STEM or girls to engage these partner organizations in efforts that support the mission of PWSE. The programmatic partnerships allow PWSE to reach additional and more diverse audiences with its programming.

Examples of activities from the past couple of years include the following:
• In collaboration with the Iowa Math and Science Education Partnership (IMSEP) and Western Iowa Tech Community College were able to offer a Taking the Road Less Traveled conference in Sioux City Iowa in November 2009
• Partner with the State Science and Technology Fair of Iowa to provide a PWSE award at their event focused on innovation that recognizes projects that embrace the creative and innovative aspects of STEM.
• Partner with the Iowa Commission on the Status of Women and the WISE program at the University of Iowa in recognizing students that write about women in STEM as a part of a statewide “Write Women Back in to History Essay” contest for middle and high school students
• Partner with the Girl Scouts of Iowa to provide the BEST (Brownies Exploring Science and Technology) and GEMS (Girls Exploring Math and Science) weekend workshops
• Partner with Delta Academy which is a program for African American middle school girls to increase awareness of STEM opportunities through hands on experiential activities and connecting with undergraduate Role Models
RECRUITMENT/Bridge/Transfer Student Programs

PWSE Ambassadors

In 2009-2010 PWSE created the PWSE Ambassador program. The program provides an additional way for undergraduates to engage with PWSE in a leadership role. Ambassadors are a small group of students who volunteer to assist PWSE by connecting with high school students during the recruitment process. Ambassadors have assisted staffing the PWSE at various events, meet with prospective students and their families during the regular daily visits, and answer questions from students via an on-line Meebo chats. Following the prospective student visits, ambassadors send handwritten postcards to the students as a follow-up. Each semester there are between six and ten students serving as ambassadors. The program is still in its infancy, so there are no formal assessment results. However, PWSE staff members note that during the prospective student visit it is helpful to have students be able to answer questions from the student perspective.

Strengths
- Enhances recruitment with student perspective
- Use of volunteers - low cost and minimal staff time
- Leadership/engagement opportunity for students
- Meebo – on-line chat allows for connections beyond campus visits
- Personal connections/follow-up postcards fit with strengths of ISU recruiting

Weaknesses
- Meebo chat function is under-utilized

Opportunities
- Expand marketing to increase usage of Meebo
- Enhance recognition of ambassadors
- Potential to enhance training and development of ambassadors
- Leverage ambassadors for more on-campus STEM events (science fairs, etc.)

Threats
- Relies on students volunteering, seeing benefits

Collaborations with Office of Admissions

PWSE collaborates with the Office of Admissions to support the recruitment of students via various admissions programs and initiatives. Admissions arranges for prospective students and families to meet with PWSE staff members at 3:15 p.m. every weekday. In addition, PWSE staffs a display booth at every large admission visit day (Experience Iowa State, Transfer Visit Days, Legacy Days, etc.) PWSE supports the recruitment process by providing the names and contact information to admission for students attending the Taking the Road Less Traveled program. Admissions has a standard mailing they send out to all female high school STEM seniors in their prospective student pool with information on PWSE and the programs we offer. The Office of Admissions also shares prospective student information with PWSE for our use in communicating with students about our learning communities, scholarship opportunities, etc.
Comments from the campus visit evaluations often cite the helpfulness of the PWSE portion of the visit. Per analysis of PWSE visit records, 65 (38%) of the 170 Fall 2010 prospective students who met with PWSE staff as a part of their visit experience enrolled at Iowa State in STEM fields.

**Strengths**
- Strong recruitment for university and learning communities
- All logistics and communications arranged by Admissions Office
- Interest is there from families – see a lot of families even though we are the last meeting of the day
- Involvement of undergraduate students via ambassadors and staffing of booth
- High visibility for PWSE

**Weaknesses**
- Requires staff person being available 3-4pm every day for meetings
- Our meeting time is at the end of day – some attrition/no shows/miss some families

**Opportunities**
- Partner with Admissions to reach students in ways other than postcard/letters (e.g. e-mail blasts)
- Develop communication stream with students in prospective pool in partnership with Admissions (before senior year, leverage career conference names, etc.)

**Threats**
- Dependent on continued support/interest from Admissions

**Connecting with Transfer Students**

Over the past four years, PWSE has undertaken several different strategies to connect with and better serve transfer students before they enroll at Iowa State. Highlights include:
- Visits at three different community colleges by PWSE staff with community college STEM faculty members
- Offering special visit days, with expenses paid by PWSE, for community college women in STEM fields
- Collaborating with the Office of Admissions on their special visit days for community college participants in the Admissions Partnership Program.
- Encouraging female community college students to participate in the former PWSE Summer Intern program.
- Providing support and programming associated with the NSF SEEC grant with the College of Engineering and Des Moines Area Community College.

**Strengths**
- Connecting with relatively untapped and growing market to expand enrollment
- SEEC grant is partnership with College of Engineering – leveraging others’ efforts
- Increasing diversity of women in STEM (non-traditional by age, socio-economic, etc.)

**Weaknesses**
- ‘n’ is still relatively small and students a very diverse needs and interests
- Mixed results/levels of participation and success
Opportunities
- Potential to inform nationally based on research/efforts
- Prime candidate for external grant funding and increased collaborations

Threats
- Potential inability to develop sustainable, programmatic efforts

UNDERGRADUATE PROGRAMS

WiSE First-Year Learning Communities

The Women in Science and Engineering (WiSE) First-Year Learning Communities for undergraduate women in STEM majors offers three main components: a living option, course clustering and peer mentoring. The living option, offered in conjunction with the ISU Department of Residence, places its participants on residence hall floors with other undergraduate women in STEM programs of study. Since its beginning in Fall 1995, the number of students selecting to live on a WiSE floor has seen steady growth. In fall 2010 there were 245 students living on ten different residence hall floors across the campus. To date, the Department of Residence has been able to add floors and spaces on floors to meet most student demand.

In addition to the residential components, PWSE partners with the academic departments and the Office of the Registrar to offer WiSE course-clustered learning teams for first-year students. This year, 114 WiSE students are taking one of the following combinations of courses with other WiSE women: Chemistry and Calculus; Biology and Chemistry; or Biology and Calculus. Finally, each residence hall floor/learning team is assigned two peer mentors, upper-division students with similar academic interests with whom WiSE students meet regularly to discuss their coursework and adjustment to university life.

The primary purpose of the WiSE First-year Learning Communities (WiSE FYLC) is to increase the recruitment and retention of women in STEM majors at Iowa State University. In order to achieve this goal, the WiSE FYLC works to reduce the feeling of isolation many first-year women in STEM encounter. PWSE has identified five learning outcomes for the WiSE First-year Learning Community:
1. Develop a strong sense of community with common goals of scholarship and excellence
2. Develop leadership skills
3. Develop a greater sense of personal well-being
4. Increase participants capacity to succeed in diverse and challenging curricula
5. Develop cross cultural understanding

In order to assess the WiSE First-year Learning Community, PWSE uses the following evidence to determine whether or not our outcomes have been achieved: (1) retention data provided by the Office of
the Registrar (2) Peer mentor journals and 1:1 meetings; (3) Orientation Feedback Survey; (4) Peer Mentor Feedback Survey; and (5) WiSE Learning Community Evaluation.

PWSE is provided retention data from the Office of the Registrar that examines the retention of women at Iowa State University, retention within a STEM major, graduation rates at Iowa State University, and graduation rates in STEM. In addition, the Registrar’s Office has provided additional information on the majors selected by students who leave STEM majors but remain at Iowa State. The complete study includes data from fall 2000 through 2009 and is located in Appendix 9. Highlights include:

- In a regression analysis, WiSE participants are twice as likely to stay in STEM than other females who start in STEM at ISU and somewhat more likely than participants in non-WiSE learning communities to be retained in STEM in the fourth fall term.
- The one-year retention rate between 2000 and 2009 (n=1419) to a STEM major for women in WiSE is 89% as compared to women in a non-WiSE learning community (n=3089) is 85% and those that do not participate in any learning community (n=1463) is 77%.
- The six-year graduation rates for women in STEM are 2000 and 2004 (n=993) to a STEM major for women in WiSE is 65% as compared to women in a non-WiSE learning community (n=2105) is 57% and those that do not participate in any learning community (n=1454) is 40%.
- From 2000 to 2005, those women who do leave the STEM major, regardless of participation in a learning community, transfer to Psychology, Elementary Education or Child and Family Services more often than any other major. The top majors men who leave STEM are Management Information Systems and Pre-Business.

In addition to the data provided by the Office of the Registrar, PWSE also receives both qualitative and quantitative data regarding the overall WiSE FYLC which we examine to make sure our programming is not only retaining students at a high level but that we are achieving our student development outcomes.

**Community.** Students often talk about the benefit of living and learning with other WiSE students and not just about their own success but working together in order to achieve their goals.

- “By being in a WiSE learning community I was able to meet a lot of girls who had my same interests and were in some of the same classes as me. This was very nice since I was new to everything in August and all of us made a connection at the beginning. Being in classes with girls on my floor is nice because it’s easy to get a question answered or to study with others”. (WiSE FYLC Student, Spring 2010)

**Leadership.** Students discuss their participation in leadership and often cite the leadership retreat as a catalyst for getting involved. Another common theme regarding leadership is having an active peer mentor who they are able to model.

- 84.3% in 2009 and 2010 (n=102) as compared to 77.8% in 2003 and 2004 (n=168) responded “I have become involved at ISU beyond my WiSE Learning Community (WiSE Student Organization, departmental club, residence or other government, etc.).

- “I got involved on campus! I started doing stuff outside of class and I feel like I have learned so much about myself and grown to become a stronger leader.” (WiSE FYLC Student, Spring 2010)

**Personal Growth.** Students talk mostly about academics, leadership and just being connected and the growth they have seen in themselves. Students reported high levels of satisfaction with their overall
experience at ISU which I have inferred as their satisfaction. However, you do see glimpses of that success in comments such as:

- **97% in 2009 and 2010 (n=101) as compared to 93.1% in 2003 and 2004 (n=168) responded “My overall experience at ISU has been positive or very positive.”**
- **I am most proud of my Engineering 170 final project: I had the ability to use many skills to accomplish the finished assignment.**

**Academic Achievement.** Students talk in great length about how their peer mentors and learning teams helped them get through a challenging first year.

- **88.2% in 2009 and 2010 (n=102) as compared to 79.5% in 2003 and 2004 (n=168) responded “I have worked collaboratively with other students on class projects.”**

- **“Working extremely hard to get a good grade in 160—which was easily the most difficult course I’ve taken so far”. (WiSE FYLC Student, Spring 2010)**
- **“Yes, by getting points for going to SIs and such it made more of an incentive for me to go to them. The SIs then helped me to better understand the hard material I was learning.” (WiSE FYLC Student, Spring 2010)**
- **“My peer mentors gave me great study tips”. (WiSE FYLC Student, Spring 2010)**

**Diversity.** For the past two years we have worked to increase the diversity of our peer mentors as well as our programming for students in this broadly defined area. Through a more diverse pool of mentors and increased programming we have increased the cultural awareness of participants.

- **80.3% in 2009 and 2010 (n=102) as compared to 72% in 2003 and 2004 (n=168) responded positively or very positively that “As a female majoring in science, technology, engineering or mathematics, my involvement in the WiSE Learning Community has ____________ impacted my confidence level for joining a diverse workforce.”**

**Strengths**

- Meeting student demand/interest
- Retention results show success – even beyond other learning communities
- Strong institutional support/funding (including registrar, Department of Residence, etc.)
- Serves as recruitment tool (especially from parent perspective)
- Develops student engagement for other programs

**Weaknesses**

- Course clustering doesn’t work as well (diversity of majors, housing, academic preparation)
- Student connecting too much with PWSE and not with departments (impact on our students in their future integration with department and lack of women in departmental based learning communities)
- Grown to size where individual participants are not as connected with office/staff – peer mentors is only connection for some
- Programming is very social oriented – not as academic focused or connected with faculty as desired
- Although increasing diversity, residential component can limit diversity (few international students, competing ethnic diversity programs, etc.)

**Opportunities**

- If residence system continues to allow for growth, the existing model is easily expanded
- Potential to add seminar course for greater academic connection/focus and increase structure
- Increase connections of participants with professionals and others across campus
- Increase partnerships with others on campus for programmatic efforts (e.g. leadership retreat)

**Threats**
- Course availability for all students can impact ability to hold seats for learning community students for course clustering
- Heavily dependent on continued institutional support (financial, residence, registrar, etc.)

**PWSE Second-year Course and Learning Community**

After participating in the first-year learning community, some students want to maintain the learning community connections and connections with PWSE into their second year. Also, research has shown that many students experience a “Sophomore Slump” where they begin to question their choice of major, future career paths, etc. To meet these needs, in fall 2007 PWSE created a second-year learning community. The community has evolved to include three major elements: University Studies 201X: WiSE Sophomore Success (a one-credit seminar course), professional development activities, including numerous job shadow and industry visit opportunities, and continued academic support programs. A syllabus for this course is included as Appendix 10. The one-credit seminar led by PWSE staff and peer mentors provides opportunities for professional development, connections with professionals to reaffirm career decisions, continued career exploration, and development of professional and leadership skills. The program also provides networking and social interactions among sophomore women in STEM fields as well as with faculty and professional in extracurricular networking events. The industry visits and job shadows cover a range of majors and interests and have been the thrust of the second-year programming in the spring semester. Students also have the opportunity to connect their coursework to the workplace by connecting students to career possibilities through plant trips, speakers, mentoring, and interaction with professionals in the workforce. Finally, we have also continued academic support for students in the second-year through tutoring services and coordinating peer mentor led study nights early in the semester to help students find study partners. Participation in the course has been higher in fall semester (and now only offered in fall) but an average of 25 students have participated each year (although it has varied between sections) with about 100 different students participating in the networking, job shadow, tour and study events annually.

Based on current literature, the WiSE second-year program has as identified the following outcomes:

1. Increased retention of women in STEM fields from the freshman to the junior year.
2. Development of leadership and career enhancing soft skills
3. Increased awareness of the career possibilities open to students with degrees in engineering and science fields.

**Increased retention.** In its fourth year of the sophomore year programming in place, PWSE does not have assessment data on the long-term retention effects of the program. There are plans to assess retention, once there have been enough participants involved to determine a valid statistical comparison. Based on the literature, it is known that the more engaged and connected students are with the college and their chosen career path, the higher their retention. For now, PWSE has relied on pre- and post-
evaluations of the course and job shadows. The fall 2010 participants reported that they do feel a part of a community and benefit from the support provided by the Sophomore Year Women in STEM.

- “I really like how the entire WiSE program tries to build a family relation with each other, and gives oodles and oodles of fun opportunities to the girls--both career and academic focused for success!”
- “I have learned a lot about my peers and about myself so far because of the activities that we have been participating in.”

Development of leadership and career enhancing soft skills within ISU undergraduate women. Fall 2010 participants reported high levels of satisfaction with both the course content and the peer mentoring they have received while participating in the course

- “The program and my mentors have gotten me focused on long term goals, and are helping me prepare for those goals now.”

Increased awareness of the career possibilities open to students with degrees in engineering and science fields. In pre/post evaluations of job-shadow opportunities in the spring of 2009, students again showed growth in areas related to their professional interests and understanding the opportunities in their career field. Students also reported significant increases in their ability to complete degree requirements. Also significant in the pre- and post-scores, PWSE found that it was important for the students to have time to interact with professional women in both formal and informal environments than which company in particular they visited.

- “This opportunity has helped me to think about things like career fairs and your direction in life rather than just studies that I hadn't thought much about before.”
- What did you gain from your job shadow opportunity?
  - “A better understanding of job options, motivation to get through the lower level weed out classes, connections with women in engineering.”
  - “Meeting other women who have gone through and are balancing family and working life. Obtaining information about finding a real life job.”
  - “I gained a closer relationship with a mentor that I can turn to for academic and career-related advice.”

Strengths
- Addresses needs of select group of students based on research on second-year slump
- Course provides academic component/structure that is not based on residence
- Engages alumni with students
- Flexibility for students to participate based on level of interest
- Develops leaders and engaged students

Weaknesses
- Course is attracting predominately engineers – makes it difficult to be inclusive of the few science students
- Social components are not well attended
Loose use of ‘learning community’ definition – no course clustering, no residential, etc. Based on course, out of class activities and peer mentors.

**Opportunities**
- Increase connections with departments/majors – helping students to transition to support from those areas
- Have offered class for a few years – reflect/modify course based on changing student expectations, needs, and assessments.
- Investigate what colleges/departments are doing for sophomore seminar courses/experiences to partner more closely with them
- Develop a course-link with English 250 – with writing exercise tied to U ST 201 course
- The industry visits/job shadow component is popular and could be expanded into regular series

**Threats**
- Dependent on institutional learning community funding for peer mentors
- Course still fairly new – will student demand/interest continue?

**Transfer Learning Communities**

Beginning in the fall of 2005-06, the WiSE Transfer Learning Community was added to provide the same type of community and academic support to incoming transfer students that had been available for first-year students. The WiSE Transfer Learning Community is configured a little more loosely than the program for first-year students, to better meet the needs of the diverse transfer population. PWSE partners with the Department of Residence to group interested students into common apartments in the university’s Frederickson Court complex. The number of students taking advantage of the housing option typically runs from four to ten students. This academic year there are 12 transfer women living together as a part of the program. In addition to the residential component, there are women who join the community to participate in the various program elements (such as access to academic support programs and tutoring, participation in networking events with professionals and industry trips, etc.), and others that join in the University Studies 201 course. One consistent element is that all students who join the learning community are assigned a peer mentor. The peer mentors arrange some small group events and meet with the students individually throughout the year. It is this position that provides students a connection to Iowa State University and its resources.

Since the program is fairly small, PWSE has tried different avenues of partnering with other ‘non-first-year’ learning communities. PWSE has worked with the College of Engineering Transfer Learning Community and TRANSPORT, the transfer community in the College of Human Sciences. However, these connections are tenuous at best as the populations remain rather small in each program.

The primary purpose of the WiSE Transfer Learning Communities is to increase the recruitment and retention of transfer women in STEM majors at Iowa State University. The goals of this program are similar to the WiSE FYLC and work to reduce the feeling of isolation many transfer women in STEM encounter. PWSE has identified the following outcomes

1. Develop a strong sense of community with common goals of scholarship and excellence
2. Develop leadership skills
3. Develop a greater sense of personal well-being  
4. Increase participants capacity to succeed in diverse and challenging curricula

We have very little assessment related to our transfer program and it is primarily qualitative as the number of participants is so small. The data we have collected is from the 2009-10 annual learning community assessment.

Community building. Transfer students participated in their own activities led by their single peer mentor. In the 2010-11 academic year we tried a new configuration of having the peer mentor live on the same floor in the university apartment complex, however, this did not result in an increase in participants. The most connected students participated in the University Studies 201 course, attended social events and study groups with other students in the second-year program.

Community leadership skills. Transfer students participated in a leadership retreat and many served on the planning committee for the leadership retreat. Students felt this was a wonderful opportunity to exercise their skills. They were also able to meet with professionals in their field and find out how they were involved in their communities which made a big impact on them.

Develop a greater sense of personal well-being. Students valued having a transfer peer mentor in their second-year that had completed internships and study abroad experiences so they could talk to them about how it fit in.

Increase participant’s capacity to succeed in diverse and challenging curricula. Transfer students talked about how their peer mentors and classmates helped them get through a challenging first year and felt as though they fit in much better.

Strengths
- Timely initiative within the state – community college to 4-year school articulation on legislature’s radar
- Although small numbers currently, we can sometimes merge in with sophomore course/activities to increase feasibility of programming
- Academic support elements are valued the most by this community
- Meeting needs of students in small setting and individually – fits with diversity of transfer population (single moms, older students, working full-time, etc.)

Weaknesses
- Low participation level for programming, assessment, etc.
- In general participants in ‘community’ are often transfers from 4-year schools not community colleges
- Students don’t perceive need – until they have been here awhile
- Struggling to find right mixture of programming/model (residential apartments is small, connection with peer mentors is sporadic, etc.)

Opportunities
- Further develop academic support the high demand elements
- Develop strategies to engage them after they are here (Open house, informational meetings, spring or second-half semester course)
- Research on student needs to better develop programming (submitted NSF grant wasn’t funded but could revise/resubmit)
Potential model shift? Away from ‘community’ idea to more of a one-on-one mentoring/engagement for this diverse population?

Threats
• If participation remains low – is learning community sustainable or effective?

Learning Community Peer Mentors

Peer mentors are a critical component to the success of all three learning communities described above. The peer mentors are undergraduate students, typically sophomores and juniors (with a few seniors), who are paid staff members that work with each learning community group. The peer mentor acts as the primary point of contact between PWSE and the members of the PWSE Learning Communities. The First-year and Transfer Learning Communities are residentially based and activities last for an academic year. PWSE has ten learning communities in six residence halls. Each learning community is comprised of approximately 20-25 first-year women in a STEM major. The Second-year Learning Community is course-based (fall) with job shadowing in the spring. Expectations of mentors are high and as such, they are required to maintain a 3.0 grade point average and work approximately 8-10 hours per week.

Although the primary role of the peer mentors is to support the students in their team, the peer mentoring experience is also an important professional development, leadership, and student engagement opportunity for the mentors. Student development outcomes for peer mentors include
  • Development of leadership skills
  • Development of leadership and career enhancing soft skills (conflict management, networking, project management, oral and written communication, etc.)

Over the past decade, PWSE has employed over 90 peer mentors for the WiSE First-year learning communities alone. Peer mentoring is assessed in two ways: students in the communities provide feedback on the effectiveness of their mentors, and mentors provide feedback to PWSE staff on the effects being a peer mentor has had on them. In a spring 2011 survey peer mentors a total of 24 mentors responded, seventeen current mentors and seven former mentors. Almost all of the students who responded to the survey indicated that they became mentors due to the positive influence of their mentor and their hope to stay connected to PWSE. A few also sought out the peer mentor position because they identified it as being a leader on campus.
  • “I wanted to have the same positive influence on freshman women in science and engineering that my WiSE mentors had on me.”
  • “It is great to work with a team as a leader. It gives me a lot of experience with leadership.”

Peer mentors are required to attend a spring training event after they are hired in the spring as well as training provided by the Iowa State Learning Communities office every fall. In addition, peer mentors are required to attend weekly group meetings with their PWSE staff supervisor. The peer mentors all agreed that the amount of training they received was more than adequate. The survey of peer mentors indicated that their role as a peer mentor helped them develop professional skills that would aid them in future
career and leadership opportunities. A summary of responses of agreement from peer mentors that the peer mentor experience positively impacted them is provided below:

<table>
<thead>
<tr>
<th>Responded Agree or Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learned how to use my time effectively</td>
</tr>
<tr>
<td>Learned to work in groups</td>
</tr>
<tr>
<td>Improved my written communication skills</td>
</tr>
<tr>
<td>Improved my oral communication skills</td>
</tr>
<tr>
<td>Conflict resolution and management</td>
</tr>
<tr>
<td>Increased my confidence leading a group of people</td>
</tr>
<tr>
<td>Improved on problem solving skills</td>
</tr>
<tr>
<td>Initiated and managed programs</td>
</tr>
<tr>
<td>Learned networking skills</td>
</tr>
<tr>
<td>Learned to how to communicate with a supervisor</td>
</tr>
</tbody>
</table>

- “The skills that are gained in this position are invaluable. The opportunity to lead and train a group of future and current leaders on campus is unique and has allowed me to blossom into a better leader myself.”
- “It particularly improves your communication, leadership, and problem-solving skills. It looks great on a resume and is a paid position. It gives you great experience planning meetings, organizing events, and managing a group”

The role of the peer mentor is also ‘assessed’ by the students in the learning communities as a part of annual peer mentor survey. Summary data for the past four years (n=263) indicate very positive responses (on 1-5 scale where “4” is agree and “5” is strongly agree):

<table>
<thead>
<tr>
<th>Learning Community Peer Mentor Survey (n=263) 2006/07-2009/10-2010/11</th>
<th>Mean Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>My peer mentor responds in a reasonable time when I express a concern</td>
<td>4.3</td>
</tr>
<tr>
<td>My peer mentor provides me with useful information</td>
<td>4.21</td>
</tr>
<tr>
<td>My peer mentor has made an effort to get to know me</td>
<td>4.14</td>
</tr>
<tr>
<td>I have sought out my peer mentor for assistance</td>
<td>3.64</td>
</tr>
<tr>
<td>I have made an effort to get to know my peer mentor</td>
<td>3.96</td>
</tr>
<tr>
<td>My peer mentor encourages learning community participants to study together</td>
<td>4.01</td>
</tr>
<tr>
<td>My peer mentor demonstrates concern about my academic success</td>
<td>4.05</td>
</tr>
<tr>
<td>My peer mentor is knowledgeable about university resources</td>
<td>4.23</td>
</tr>
<tr>
<td>My peer mentor is skilled at facilitating discussions</td>
<td>4.06</td>
</tr>
<tr>
<td>My peer mentor is knowledgeable about the issues discussed in my learning community</td>
<td>4.02</td>
</tr>
<tr>
<td>My peer mentor has kept me informed about upcoming learning community activities</td>
<td>4.33</td>
</tr>
<tr>
<td>Overall my peer mentor has been helpful</td>
<td>4.26</td>
</tr>
</tbody>
</table>

**Strengths**
- Peer mentors are a valued (if not the most valued) component of the learning community experience by participants
- Provides professional development and student engagement opportunity for students
- Financially supported by central administration via the Learning Community Initiative
- Able to leverage university training programs for peer mentors to enhance our efforts
• Students will tell other students about issues/problems that they won’t come into the office about on their own. Identify and begin to address issues earlier.

Weaknesses
• The more mentors we have, the more layers we have separating students from the PWSE staff and office itself.
• Sometimes students blur the roles/lines between the learning community mentor and the residence hall community advisor.

Opportunities
• Be more intentional about providing on-going, ‘development’ opportunities as a part of the peer mentor experience.

Threats
• Funding for peer mentors is dependent on the central Learning Communities office fully funding the programs.
• PWSE staff time to supervise the number of peer mentors.

Scholarships

PWSE has offered scholarships throughout its history. The majority of the scholarships are based on academic merit, with financial need not being a criterion for selection. PWSE used to supplement dollars designated for scholarship from donors with undesignated gifts to PWSE. However, due to shrinking budgets and gifts, in Fall 2010 PWSE discontinued that practice. Now all scholarships awarded come from gifts that are specifically designated for scholarships. Over the years, PWSE has tried to incorporate various programming elements with the financial scholarship (ranging from a simple awards luncheon, to monthly group meetings with recipients, to a program funded by Cargill that included visits to the company and a K-12 outreach expectation for recipients.) At this time, there are no ‘programming elements’ for the scholarship recipients. In 2010, PWSE received a $1 Million endowment from a single donor. This gift significantly increases the number of scholarships we can award. (In Fall 201 we awarded 25 $1000 scholarships, for Fall 2011 we anticipate awarding 44 $1000 scholarships.)

Strengths
• Funding at whatever level scholarship endowments and gifts generate – not competing for program funds
• Provides financial support and recognition to students and aids in recruitment/retention
• Fortunate that most scholarship have few restrictions beyond women in STEM – can support current, transfer, and first-year students
• Recently received million dollar endowment that significantly increases the number of awards going forward. Also provide opportunity to rethink how we award scholarships, etc.

Weaknesses
• No structured connection with scholarship recipients other than providing funds. Had previously tried receptions, monthly programs, etc. – but discontinued all of these
• Only $1000 scholarships – nice ‘supplementary’ scholarships but not large impact
• Applicant pool isn’t very diverse. Many diverse students receive other university scholarships that are full-tuition, etc.
Opportunities

- Investigate (based on assessment which is lacking) is there more strategic way to use funds to impact recruitment/retention. (transfer students, particular majors, need based instead, etc.?)

Threats

- With scholarships using gender as criteria there are potential challenges down the road

Academic Support

PWSE has provided academic support for women in STEM majors in a variety of ways over the past few years. We have paid graduate students to facilitate small group study sessions for key courses, we have facilitated group study nights and study partners, we have provided funding for students to receive tutoring, etc. In 2009-2010 PWSE is using the following strategies to provide academic support for students:

- For students in the WISE learning communities, PWSE provides funding for one course each semester for students to participate in small group tutoring sessions. Tutors are arranged through the university’s Academic Support Center. In addition to learning community students, the College of Engineering provides funding to PWSE so that any engineering student (regardless of learning community participation or year in school) can receive the same one course tutoring support.
- PWSE facilitates students participating in student-led study groups for courses. Students can indicate their interest and identify for which courses they want to participate in study groups. PWSE staff assists in connecting interested students.
- Peer mentors facilitate group study sessions for students in their learning communities.
- PWSE partners with the university’s Supplemental Instruction program to make sure that there is SI available for as many PWSE learning team course sections as possible.

Thus far in the 2010-11 academic year, 136 students have taken advantage of group tutoring through the Academic Success Center sponsored by PWSE. PWSE also facilitated the matching of 34 tutoring clusters of 3-4 students each based on the first-year students course schedules and living arrangements with the peer mentors assuming the responsibility of keeping those groups connected once the initial information and first meetings were set. Those sessions have evolved to some being facilitated by peer mentors while others are student-driven sessions. The second-year and transfer students held three WiSE sponsored study groups in the fall semester with about six to nine participants at each session but has not continued for the spring semester. Those that worked well splintered into their own study groups and there was not interest from students to continue these peer mentor sponsored study nights.

Strengths

- Supports academic success of students and ultimately retention/graduation
- Leverages other services on campus
- Provides options for self-led group study and facilitated small group tutoring
- Actively promoted by peer mentors – so ‘stigma’ of seeking help is diminished
Serves as recruitment tool, especially with parents

Weaknesses
- Limitations are financial. Use involvement in learning community as limiting factor (for all but engineering students)

Opportunities
- Expand to non-learning community students if funding available

Threats
- Similar to scholarships, this has financial implications that could eventually be challenged in courts

Other undergraduate programs/services

E-WISE
Each semester, PWSE receives information on all women enrolled in STEM fields at Iowa State University from the Office of the Registrar. All of the students have the opportunity to be part of E-WISE, an e-mail newsletter, offered by PWSE. There are currently 3403 students receiving information from PWSE on a weekly basis. Examples of topics covered in E-WISE include the following: campus events; opportunities for involvement, scholarships, jobs, career exploration, and mentoring; tips for academic success; Iowa State campus resources (Supplemental Instruction); and student organization information and opportunities. The success or interest level of students can be noted by the fact the although given the option, very few (less than 50 students a year) opt out of receiving this updates

Raising Awareness of Students
Through e-WISE, PWSE staff shares opportunities for students to get involved in research, scholarships, leadership positions, etc. In addition to raising the awareness of these opportunities, PWSE staff also nominates students for awards and spends a significant amount of time writing reference letters in order to ensure women in STEM majors are represented among campus leaders and awards. As an example, this past year two students nominated by PWSE were selected as recipients of the “Women Impacting ISU” award.

Student Organization Connections
There are currently three student organizations at Iowa State that are primarily focused on women in STEM fields: the Society of Women Engineers, Alpha Sigma Kappa (sorority for women in technical fields), and a locally-based Women in Science and Engineering Club. PWSE connects with the leaders and advisors of these student run organizations to support their efforts, and avoid scheduling conflicts, etc. Lora Leigh Chrystal serves as the advisor for the WISE organization. The other two organizations have advisors outside of the PWSE staff.
OTHER PROGRAMS

Grant Partnerships

PWSE collaborates with both internal and external partners on external grants. In some situations PWSE has taken the lead; however, for most grants PWSE provides a supporting role. Examples of recent grant partnerships are highlighted below:

- Karen Zunkel is listed as ‘key personnel’ and PWSE receives salary and programming support from the SEEC grant that is a partnership between Iowa State’s College of Engineering and Des Moines Area Community College. The entire PWSE staff has been involved in programming and supporting the efforts of this grant. Funds have supported efforts focused on recruitment of women into STEM majors and developing programs for students transferring from community colleges. The grant also includes K-12 outreach components that are not limited to transfer students. Carol Heaverlo has been working with the grant team and ISU Extension on these initiatives.

- Karen Zunkel assisted the Iowa Department of Education in writing a proposal for the State of Iowa to join the NSF funded STEM Equity Pipeline Grant administered by National Alliance for Partnerships in Equity. Karen and Carol Heaverlo are part of the state leadership team. Carol has assisted in program offerings to community college and high school educators associated with Project Lead the Way as a part of this grant.

- PWSE partnered with faculty at Western Iowa Community College in Sioux City, IA to secure an Iowa Math and Science Partnership Grant to offer a Taking the Road Less Traveled career conference for 6-10 grade girls in Sioux City in November 2009.

- On an annual basis PWSE collaborates with 20-30 faculty members to incorporate elements in their NSF “broader impact’ educations components focused on women in STEM. Several have been funded with components such as developing kits for our role models, presentations for career conferences, engaging undergraduates in research, and creating a “women in physics” departmental initiative.

- PWSE partnered with the Iowa Department of Education and the Women in Science and Engineering program at the University of Iowa to submit the recent NSF research grant on community college transfer women in STEM.

Strengths

- Can provide funds to support our initiatives
- Engages others in our mission – accomplishing our goals

Weaknesses

Grant goals don’t always directly mesh with our priorities, if we weren’t; involved significantly in the development of the grant

- Control – momentum, progress – at others mercy – if not part of PI team
- Sustainability not always possible after grant funding ends
- Increased partners leads to complexities in communications and maintaining coordinated progress

Opportunities

- By involving others, increase the potential impact beyond the reach of PWSE
- With other budgets decreasing, provides a different potential funding source for programming
Threats
- Increasingly competitive nature of grants reduces likeliness of funding
- Grant funding sources most often require ‘new’ initiatives versus funding existing proven sources

Raising Awareness

PWSE works to raise awareness in two related areas: 1) raising awareness of issues associated with women in STEM (with the goal of engaging the support of others in our mission) and 2) raising awareness of PWSE and its programs (with the goal of increasing involvement and support of our initiatives). Samples of recent activities and initiatives aimed at raising awareness are listed below:

- Complete revamping of the website to include student profiles, new navigation buttons for transfer students, more resources for all constituencies, etc. In 2010 there were 13,188 unique visitors who accessed nearly 46,000 web pages of information on the PWSE website.
- Developed consistent marketing image for PWSE, using “Changing the Conversation” messaging, in display banners, website, postcards, brochures, etc.
- Presentations to a wide range of groups: Iowa House Education Committee, Project the Lead the Way statewide annual conference, Midwest Conference on Transportation and Industry, Conference, etc.
- As a result of representation to the Iowa House of Representatives, the legislature now requests a joint annual report on the Status of Women and Minorities in STEM from the three state public universities.

Strengths
- Engages others in support of mission
- Flexible activities that staff can fit into schedule as time allows
- Requests are starting to be initiated by others, so PWSE name recognition is beginning to develop
- Consistent marketing materials lead to continued reinforcement of messages

Weaknesses
- Rely on time from Lora Leigh to develop marketing materials and website – takes time away from her other programming efforts
- All print material (specifically brochures) are out-of-date as programs change
- Website is not as active or engaging as it could be and continual updating takes time!
- Currently respond to request for presentations – no comprehensive, proactive plan for presentations

Opportunities
- Many opportunities to expand/enhance marketing materials (website updates, poster series requested by teachers, etc.)
- Explore new technologies in reaching students and prospective students
- Most presentation requests are from external audiences – more targeted presentations on campus might engage others.

Threats
- Lack of technology support - trends changing too quickly for PWSE staff to learn/implement new strategies
Involvement of PWSE Staff Members in Committees, Organizations, and Initiatives

PWSE staff members are involved in a wide variety of committees, organizations, and initiatives both on-campus and off-campus. The staff members serve a variety of roles and functions depending on the group. Sometimes staff serves the role of ‘expert’ providing advice/insight on issues of women in STEM, learning communities, or the various programs we offer. Other times, staff engages in the committee to insure that diversity and women in STEM are not lost in the discussions, to influence the outcomes of others. Staff also gets involved in groups as a way to develop new partners for programs. Listed below is a sampling of groups that PWSE has been involved with in the past few years:

Karen:
- Writing committee for Iowa STEM Educational Roadmap – Strategic Plan, developed at request of governor’s office
- Statewide Diversity in STEM conference planning committee organized the Iowa Department of Education
- Women of Innovation – statewide award recognizing women taking leadership roles and advancing STEM – planning and selection committee
- Women’s Leadership Consortium – on-campus group providing program coordination and insight/guidance to ISU senior leadership
- Iowa Department of Education, Community College Division, Equity Leadership Team
- One of initiators of Big 12 Women in Engineering group meetings
- Board of Directors and committee roles for WEPAN
- State Leadership Team for NAPE STEM Gender Equity Grant
- ISU NSF Advance Grant Advisory Council
- ISU NSF I3 Grant - SP@ISU Advisory Council

Lora Leigh:
- ISU Learning Community Advisory Committee
  - College of Agriculture and Life Sciences LC Working Group
  - College of Engineering LC Working Group
  - College of Liberal Arts and Sciences LC Working Group
- Co-chair of sophomore year experience task force
- WEPAN conference publications chair (website, program, etc.)

Carol:
- Iowa Math and Science Coalition – sponsor statewide high school STEM summit
- NAPE State team
- NSF SEEC Grant with College of Engineering
- Reviewer for the Statewide STEM Strategic Plan

Strengths
- Engaging other people in our missions
- Professional development and increases knowledge base of staff
- If PWSE doesn’t participate, the issue of women in STEM would not naturally be included in discussions
- Potential to create long-term systemic change
Weaknesses
- Possible partners are endless which means this can become a time sink for staff
- Difficult to measure outcomes since outcomes would be indirect

Opportunities
- Endless potential partners

Threats
- Unwillingness of others to involve PWSE staff due to competition for resources, etc.
- Staff burn-out – need to prioritize involvement, since opportunities are endless

WHAT WE DO NOT DO

Over the years, the programs and mission of PWSE has shifted based on where the program was placed within the university organization, the interests of funding agencies and staff, and the needs of the constituencies. Currently PWSE does not provide direct programming for female faculty/staff, post-docs, or graduate students in STEM fields. We collaborate with others on campus involved with supporting women at these levels (such as the NSF Advance Grant and the Women’s Center); however, PWSE does not have specific programs targeting the recruitment or retention of women graduate students or faculty in STEM fields.

In recent years, as shrinking budgets have forced the PWSE staff to more closely evaluate program effectiveness, centrality to mission, and cost/benefits, there have been several programs discontinued. These programs were in place at the time of the last external review (and some as recently as 2009-2010). Below are the discontinued programs, along with some key factors influencing the decision to discontinue the program.

- Summer Intern Program for High School Students (Last held summer 2004)
  - Had shifted to serve relatively small group of students (most with connections to ISU already)
  - Was providing opportunity to talented students who were already destined for STEM undergraduate careers
  - Yield to ISU was not all that positive, for the expense. Many students used it to build their resumes to get into ‘more prestigious’ schools.
  - Was expensive program, with no dedicated funding stream
  - Since the positions at the time were classified as employees, we were running into potential child labor laws (exposure to chemicals, etc.) that were hard to manage in a distributed program.
- Summer Intern Program for Undergraduate Students (Last held summer 2010)
  - When program was established over 20 years ago, there were not all the opportunities of NSF REU programs, etc. out there for students to take advantage of.
  - The other programs were fully funded and provided better financial/support packages for participants (stipend, room/board, travel – versus our stipend only program)
PWSE expended between $15K and $40K of discretionary funding each year on the program. In addition colleges spent another $20K of their discretionary funding on stipend matches. So a very expensive program for 15-16 ISU students (34 students overall)

Staff time committed to the program was equivalent to almost 40% of a professional staff member’s time spread across the year.

Although great program encouraging top women to explore research, potential future graduate/faculty positions, it isn’t closely aligned with success/graduating women with bachelor degrees in STEM. Most women selected for the program are already successful and will graduate in their chosen STEM field.

- **Getaway (Last held Spring 2008)**
  - Was developed as tool to recruit students to learning communities and increase yield
  - Discovered that most students attending had already made their decision to attend ISU and were using this as a ‘fun’ way to connect earlier but it was not affecting their decision making process
  - The learning communities are filling up and exceeding allocated space so proactive recruitment into them is not as needed.
  - Was a ‘nice program’ that students liked, but not really making any significant difference on program outcomes
  - Was a significant time commitment for a graduate assistant to coordinate the program (so staff time to program outcomes not effective)

- **GirLinks (Last held 2009-10)**
  - Interest from high school students for the program had decreased.
  - High school students not using e-mail as form of communication
  - Using Ambassador Meebo chat and some Facebook to reach out in a less structured method than the GirLinks one-on-one mentoring
IV. BROAD UNIT ASSESSMENT

Progress on Issues Raised in Last Program Review

The external review conducted in February 2005 raised three primary issues that PWSE needed to address:

1. Clarify and articulate a PWSE mission that aligns with the University mission and goals/objectives with desired outcomes
2. Develop appropriate and more easily accessed data and disseminate these data among the general population
3. Develop power linkages – linkages that are proactive, dynamic and championed from the top – to create integrated institutional approach

Clarification of Mission:
After the review, PWSE staff and advisory board set about developing a clarified mission statement and priorities for the program. PWSE released a five-year strategic plan along with very specific tactical plans to achieve progress on the strategic plan. PWSE has used the mission statement and strategic plan in all work with the PWSE advisory board, is included in each year’s annual report, and is available on the PWSE website.

Access to data:
The discussion of PWSE gaining access to institutional data on a regular basis was deferred by university leadership until the implementation of a new electronic data warehouse system was in place. This system has taken much longer than expected to develop, so at this point PWSE still does not have easy access to university data. In the interim, a staff member in the Office of the Registrar has assisted PWSE staff in pulling data to measure success of learning community participation periodically. Also, the need for the institution to collect data for the report to the legislature has resulted in PWSE gaining access to graduation and enrollment data disaggregated by ethnicity, which was not available before. This is still an area where PWSE needs to continue to work with others and wait for the institutional implementation of the data warehouse.

Power Linkages for Integrated Institutional Approach:
In the previous review it was noted that PWSE was trying to approach the issue of the under-representation of women in STEM by providing student programming and also by trying to create systemic change. The historical strength of PWSE was with providing direct student programs. However, the future seems to implore that PWSE should work with others to create change within the institution to support the success of women in STEM beyond the efforts of direct student programs. Subsequent discussions by PWSE staff, ISU administration, and the PWSE Advisory Board have come to the conclusion that at this time, PWSE needs to continue to straddle between these two areas. To further advance the systemic/institutional change, PWSE has been much more proactive at creating ‘power linkages’ with other programs/initiatives on campus (and off-campus) that can impact ISU or the state related to women in STEM. Specific examples include: PWSE being been added to advisory councils for the NSF Advance Grant and the new SP@ISU institutional integration grant, PWSE’s role in shaping the report to the Iowa Legislature on the Status of Women and Minorities in STEM, and PWSE staff’s
contribution to the new statewide STEM strategic plan. For the foreseeable future, PWSE staff anticipates that they will continue to balance staff time and resources between direct student programming and the collaborations that can lead to institutional change components of our mission—supporting immediate needs while aspiring to creating long-term/systemic change.

Fulfillment of Mission

The surveys conducted by PWSE of administrators, faculty, staff, partners and alumni asked for their satisfaction of progress PWSE had made on the three areas of the PWSE mission statement. Respondents indicated that they were ‘satisfied’ or ‘very satisfied’ with the progress PWSE was making as shown below:

96% - Create, offer, and maintain innovative undergraduate and outreach programs that engage a diverse audience of women and girls in an experiential and supportive learning environment in STEM.

81% - Share knowledge on innovative strategies, best practices, and research on the success of women in STEM with a broad range of individuals and organizations serving as partners in transforming the STEM educational experience for women.

88% - Engage a broader, more diverse group of women pursuing STEM careers.

PWSE also asked the same questions of undergraduate women in STEM in a survey conducted in February 2011. When taken across the broad cross section of students (some with limited to no interaction with PWSE up to students with high levels of involvement), the responses of ‘very satisfied’ and ‘satisfied’ for these same questions came back at 68%, 62%, and 63% respectively. There was a linear relationship between positive responses and the level of involvement/knowledge students had with PWSE. For those students highly engaged with PWSE programs, these percentages jump to 88%, 75%, and 76%, respectively.

From the earlier review, when clarification of mission was identified as an issue, PWSE had made significant progress on clarifying the mission and prioritizing staff time and resources to make progress on the mission. It is not surprising that the first area ‘offering programs’ received the highest rankings, as that has been the perceived role and strength of the program for the past 24 years. Although the other two areas that deal with partnerships for progress and systemic change and addressing the diversity of women are newer areas within the mission, they also were viewed very positively by respondents.

Progress on PWSE Strategic Plan

The surveys conducted by PWSE of administrators, faculty, staff, partners and alumni and current undergraduate students in STEM fields asked to rate their satisfaction of progress PWSE had made on the five priority areas of the PWSE 2007-2012 strategic plan. Respondents indicated that they were ‘satisfied’ or ‘very satisfied’ with the progress PWSE was making as shown below:
<table>
<thead>
<tr>
<th>Priority</th>
<th>Faculty, staff, partners, alumni, administrators</th>
<th>Female undergraduate STEM students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expand partnerships with individuals and organizations to increase the impact of PWSE programs and initiatives.</td>
<td>77%</td>
<td>61%</td>
</tr>
<tr>
<td>Broaden the participation in PWSE programs and initiatives</td>
<td>82%</td>
<td>60%</td>
</tr>
<tr>
<td>Improve quality and effectiveness of PWSE programs through continuous assessment.</td>
<td>89%</td>
<td>71%</td>
</tr>
<tr>
<td>Serve as a knowledge resource on issues and programming related to women in STEM.</td>
<td>85%</td>
<td>76%</td>
</tr>
<tr>
<td>Create a presence and awareness of PWSE and the issues associated with women in STEM fields.</td>
<td>80%</td>
<td>63%</td>
</tr>
</tbody>
</table>

Similar to the questions on the PWSE mission statement, the student responses varied dramatically based upon their knowledge/involvement with PWSE.

In addition to survey data, the brief highlights below are examples that demonstrate the activities or progress made for each of these five priorities:

Expand partnerships with individuals and organizations to increase the impact of PWSE programs and initiatives:
- Of 29 total partner/collaborator types, 15 were new or significantly expanded during the past 4 years.

Broaden the participation in PWSE programs and initiatives:
- Growth of participation in the student role model program
- Growth in learning communities participation for first-year, second-year and transfer students
- Offering career conference in western Iowa via a grant
- Outreach of programming for transfer students
- Increased diversity in student role models, peer mentors, etc.

Improve quality and effectiveness of PWSE programs through continuous assessment:
- Conducted K-12 Needs Assessment
- Continual updating/revision of programs based on feedback
- Prioritization/elimination of programs based on strategic plan

Serve as a knowledge resource on issues and programming related to women in STEM:
- Since the implementation of the strategic plan, PWSE has been much more active in connecting with groups outside of PWSE (which is reflected in the colorations priority). In many of these situations, PWSE staff members are serving as knowledge resources in these partnerships.
- Service on the NSF Advance Council
- Assisting faculty with broader impact programming for NSF grant proposals

Create a presence and awareness of PWSE and the issues associated with women in STEM fields:
- Presentations to various groups
- Development of the report on Women and Minorities in STEM and presentations for the Iowa Legislature
- Inclusion as a writing team member on the state of Iowa STEM strategic plan.
Progress on Enrollment and Graduation of Women in STEM

PWSE has seen growth in the enrollment and graduation of female STEM students from Iowa State over the history of its program. Fall 2010 saw the largest enrollment of undergraduate women in STEM both in terms of numbers (3813 female students in STEM) and percentage (33.4% of STEM students were female). The charts below illustrate the growth in enrollment of women in STEM fields in terms of number of students and percentage of STEM students that are female from Fall 2000 to Fall 2010. In addition, since attracting a more diverse population of women is part of the mission, charts that highlight the growth in the number and percentage of women of color are also included. In addition to enrollment information, total bachelor degrees awarded to women in STEM and to women of color in STEM area also shown below. Enrollment charts that provide breakdown by academic colleges are contained in Appendix 11.
# STEM Undergraduate Females of Color

Fall Semester Enrollment

% STEM Undergraduate Females of Color

Fall Semester Enrollment
Impact on ISU Strategic Plan and Mission

As a land-grant institution with a science and technology focus, PWSE’s role of addressing gender diversity in STEM can be viewed as a critical contributor towards the institution’s progress on its mission. Ninety-two percent of the faculty, staff, administrators, partners and alumni surveyed were satisfied with contributions PWSE was making towards Iowa State’s mission.
In a decentralized university, some might question the impact that a small central unit such as PWSE can have on the mission of an institution. Through collaborations across campus and well recognized, successful programs, PWSE can be viewed as making contributions to the mission of the university overwhelmingly positive responses to the survey.

Meeting Needs of Students via Quality Programs

PWSE’s success in meeting the needs of students can be measured in three ways: 1) demand/interest for programs, 2) individual program feedback/assessment and 3) direct survey responses from constituents. The first two ways have been addressed in the section above where individual programs are discussed in detail (e.g. extreme growth in student role model program and learning communities, increased retention of women in STEM in PWSE learning communities). The student survey, the faculty, staff, administrator, partners and alumni survey, and the K-12 needs assessment surveys all provide feedback from constituents on PWSE’s success in providing quality programs that meet student needs.

Students and faculty, staff, administrators, partners, and alumni were asked to rate their satisfaction of the progress PWSE has made in providing quality outreach and undergraduate programs for women in STEM. Results from those surveys show that for both groups, they were “satisfied” or “very satisfied” with PWSE’s progress as shown below:

<table>
<thead>
<tr>
<th>Survey Group</th>
<th>Satisfied or Very Satisfied with PWSE providing quality outreach programs</th>
<th>Satisfied or Very Satisfied with PWSE providing quality undergraduate programs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current undergraduate women in STEM</td>
<td>63%</td>
<td>71%</td>
</tr>
<tr>
<td>Faculty/staff/administrator/Partners/Alumni</td>
<td>94%</td>
<td>96%</td>
</tr>
</tbody>
</table>

As a part of the surveys administered in February 2011, PWSE asked respondents to rate the ‘importance of specific programs/initiatives’, as one way to determine priorities of programs in the event future cuts are needed and/or to enhance those programs viewed as most important. On a scale of ‘not important’, ‘somewhat important’, ‘important’ or ‘very important’, respondents with an opinion rated programs as important or very important as shown in the table on the following page.
<table>
<thead>
<tr>
<th>Outreach Program Needs Assessment 2008-2009</th>
<th>Faculty, staff, partners, administrators, alumni rating important or very important</th>
<th>Current Undergraduate Women in STEM rating important or very important</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taking the Road Less Traveled (6-12th grade girls) Career Conferences</td>
<td>94%</td>
<td>87%</td>
</tr>
<tr>
<td>Student Role Model Program (Undergraduate STEM students visiting k-12 classrooms across the state)</td>
<td>97%</td>
<td>85%</td>
</tr>
<tr>
<td>Prospective student interaction (Daily meetings between PWSE Staff and prospective students)</td>
<td>86%</td>
<td>83%</td>
</tr>
<tr>
<td>PWSE Ambassadors Program (student volunteers meeting with prospective students)</td>
<td>94%</td>
<td>85%</td>
</tr>
<tr>
<td>Outreach Program Partnerships (Girl Scouts, statewide essay contest, state science fair)</td>
<td>79%</td>
<td>83%</td>
</tr>
<tr>
<td>WiSE residential first-year students learning community</td>
<td>95%</td>
<td>88%</td>
</tr>
<tr>
<td>WiSE residential transfer students learning community</td>
<td>92%</td>
<td>80%</td>
</tr>
<tr>
<td>WiSE course clustering/academic learning team</td>
<td>87%</td>
<td>78%</td>
</tr>
<tr>
<td>University Studies 201X: WiSE Second Year and Transfer Student Success Seminar</td>
<td>79%</td>
<td>65%</td>
</tr>
<tr>
<td>Academic student support (tutoring and group study sessions)</td>
<td>89%</td>
<td>90%</td>
</tr>
<tr>
<td>Women in STEM Scholarships</td>
<td>88%</td>
<td>94%</td>
</tr>
<tr>
<td>PWSE staff members’ contributions on internal and external committees, collaborations with internal and external constituencies, etc.</td>
<td>85%</td>
<td>85%</td>
</tr>
<tr>
<td>PWSE staff members sharing information via presentations, website, mailings, etc.</td>
<td>83%</td>
<td>86%</td>
</tr>
<tr>
<td>PWSE involvement with externally funded grants (e.g. National Science Foundation Grants with the College of Engineering and Iowa Department of Education)</td>
<td>90%</td>
<td>89%</td>
</tr>
</tbody>
</table>

As another method of assessing our outreach efforts, in the fall of 2008, the Program for Women in Science and Engineering (PWSE) contracted with the Research Institute for Studies in Education (RISE) to conduct a needs assessment specifically for the outreach program.

The purpose of this needs assessment was 1) to systematically identify existing knowledge and attitudinal characteristics from specified target populations regarding the Iowa State University Program for Women in Science (PWSE) STEM related outreach activities and programs and, 2)
to systematically identify potential gaps between current PSWE outreach activities and programs and what should or could be done to more effectively reach the desired outreach populations. Information from these surveys will help inform program decisions for PWSE K-12 outreach.

Information was collected from K-12 educators, parents (who attended the Taking the Road Less Traveled career conferences), and 6-12 grade girls (who attended the career conferences). Focus groups, paper-based surveys and on-line surveys were all used in the process. PWSE staff is starting to use the results of the survey to inform programmatic efforts in the K-12 area.

The complete needs assessment report is available on the PWSE website. Below is a brief summary of the findings from the report:

From the October 2008 focus groups, parents and teachers stated that lack of exposure to STEM activities and programs and female role models contributed to young women and girls not pursuing STEM fields. Both parents and teachers shared that there needs to be more opportunities for young women and girls to actively engage in math and science through hands-on activities, fields trips, mentoring, as well as with women working in the STEM fields. Parents and teachers mentioned a need to support technology in the classroom as well as interactive teaching methods but raised concerns about budget constraints. Additionally, parents and teachers mentioned that peer pressure and wanting to be “cool” continues to affect the choices of young women and girls to pursue interests in math and science. Regarding how PWSE can assist parents and teachers, participants indicated a desire to have more information and resources to share with their daughters/students to encourage STEM field exploration as well as providing opportunities for young women and girls to actively engage in STEM activities through workshops, conferences, and speakers.

From the April 2009 student survey, students indicated that their science teachers are most likely to talk with them about careers in STEM fields followed by their school counselors and math teachers. Creativity and design rated the highest among students, when asked about their interests in a number of STEM related program areas and activities. Students were least interested in Space/Astronomy. When asked about their confidence in the same STEM program areas and activities, science received the highest confidence score and engineering the lowest confidence score. For each of the STEM related programs and activities middle school student indicated higher confidence scores than high school students.

From the June 2009 teacher survey, 33% of teacher respondents indicated that strategies for encouraging participation by underrepresented groups in STEM were inadequate in their school district. Forty-nine percent indicated that opportunities to participate in in-service activities in science were inadequate in their school district; 47% stated the same for math in-service activities. Ninety-two percent felt that opportunities to share ideas and strategies with peers were important to improving math and science in their school district and 40.9% felt that opportunities to do this were inadequate.

Ninety-two percent of teacher respondents agreed that partnerships with universities are a good way to enhance STEM programs in their school district. Over 80% of teachers indicated that their school districts need additional funding for science, technology, engineering, and math. Slightly over 38% of teachers stated that professional development opportunities and needs related to content knowledge in engineering
were inadequate in their school district. Twenty-nine percent also noted that professional development focusing on meeting the needs of underrepresented groups in STEM was inadequate. Only 46.6% of teacher respondents agreed to being supported by a network of math/science teachers and 70% indicated that they would benefit by having a STEM professional learning community in their school district.

**Efficient Use/Prioritization of Resources**

In recent years, PWSE has continued to experience growth in demand for programs while at the same time experiencing reductions in budget and staff. Decisions and prioritizations associated with allocations of resources (including staff time and money) have been based on an assessment of program impact on the PWSE mission and a resource/benefit analysis. PWSE staff involved faculty and the PWSE Advisory Board in discussions associated with prioritization. Through this process, PWSE has eliminated several programs, including ‘legacy’ programs in student research, to be able to maintain quality and meet the needs of higher impact programs. Although there was not unanimous agreement (especially in the case of eliminating the undergraduate research program where select STEM faculty were passionate about the program), given the constraints and centrality to progress on mission, staff and the advisory board were comfortable with the decisions.

PWSE also asked this question of the two survey groups in the February 2011 surveys. Ninety-four percent of the respondents in the faculty/staff/administrator/partners survey were “satisfied” or “very satisfied”, while 75% of the undergraduate students were “satisfied” or “very satisfied”.

**Impact on Iowa**

Of those faculty, staff, administrators, partners, and alumni sharing an opinion, 85% were “satisfied” or “very satisfied” with PWSE’s progress in “Fostering statewide awareness on issues of women in STEM”. Sixty-four percent of the student respondents were “satisfied” or “very satisfied” with PWSE progress on this issue.

The emphasis within the strategic plan on partnerships and serving as knowledge resource has led PWSE to be instrumental in the request by the Iowa Legislature for an annual report on the Status of Women and Minorities in STEM. Also, through active involvement in the writing of the recently released Iowa STEM Roadmap, PWSE was able to insure that the issues of women’s representation in STEM was included in this statewide document.

Another way to measure statewide impact is to look at the counties of participants for PWSE’s Taking the Road Less Traveled career conferences. The map on the following page represents the schools in attendance at the Taking the Road Less Traveled since spring 2004. PWSE has had participants from 96 of Iowa’s 99 counties during this time period.
Comparison with Peer Institutions

How other institutions the size of Iowa State are addressing the issues of the under-representation of women varies dramatically. However, there are five typical configurations:

- a Women in Engineering Program within a College of Engineering (with possibly a comparable program in a science college),
- a Diversity in Engineering program (that incorporates both ethnic minority and women students),
- a Women in Science and Engineering program (administered from a variety of locations),
- an “Engineering Excellence” program that is inclusive of all students in engineering, or
- no direct identifiable programming efforts other than individual faculty members or organizations like student sections of the Society of Women Engineers.

Most programs that serve both science and engineering students are typically housed in one college, or have dual reporting lines to two or more colleges in an institution. The fact that PWSE reports to the Office of the Executive Vice President and Provost is fairly unique for an institution of Iowa State’s size. As noted in the last review, the University of Michigan has reporting lines through the provost office, but
also reports to two deans of academic colleges. (There are WISE programs at smaller, technically-oriented institutions, where the program reports to the provost or another central administrative office.)

Staffing size, funding structures, and program elements vary dramatically from institution to institution. The majority of the programs will have elements that address both K-12 outreach and support for undergraduate students. Through college websites and relationships that PWSE staff members have with some of the institutions, PWSE can provide some insights into typical program offerings of WIE or WISE programs. Common K-12 outreach programs are special group campus visit days (such as Introduce a Girl to Engineering Days), summer ‘camp’ type programs (most often for middle or high school students), and a few summer bridge programs (for students the summer before they enter the institution). To support undergraduate students, residential communities, academic support, connections with Society of Women Engineers, and some sort of mentoring program are typical elements. In reviewing program websites at peers, the volume of students PWSE at Iowa State reaches through its career conferences and student role model programs is unique among institutions. However PWSE does not offer ‘summer camp’ type experiences that many of our peers host. At the undergraduate level, our attempt to develop programming for the transfer student population is also unique.

Since there is no consistent definition or collection of data across institutions on science, technology, and math (the S, T, and M components of STEM) it is difficult to compare the progress of PWSE with peers. So a true comparison of PWSE at Iowa State with our peers is not feasible. However, through the American Association of Engineering Education College Profile data, we are able to compare Iowa State’s College of Engineering with Peer 11 and other Big 12 Institutions.

When interpreting the engineering data on percentage of women, one has to be careful to draw too many conclusions as some institutions with higher selectively can potentially more easily influence the demographics of their classes. Also, within engineering colleges, there are significant differences in gender based on the types of majors offered and the size of those programs. (For example, institutions with larger Biomedical, Biochemical, or Environmental Engineering programs, which traditionally draw more women, will see a higher percentage of women.)

Charts that show Iowa State’s College of Engineering in relation to its peers are provided on the following page:
<table>
<thead>
<tr>
<th>Institution</th>
<th>Category</th>
<th>Enrollment</th>
<th>BS Grads in Engr.</th>
<th>Female grads</th>
<th>%Female</th>
<th>Program type(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Texas A&amp;M</td>
<td>Peer 11</td>
<td>7429</td>
<td>1111</td>
<td>227</td>
<td>20.4%</td>
<td></td>
</tr>
<tr>
<td>Wisconsin</td>
<td>Peer 11</td>
<td>3730</td>
<td>592</td>
<td>114</td>
<td>19.3%</td>
<td>College of Engineering Diversity Affairs</td>
</tr>
<tr>
<td>Arizona</td>
<td>Peer 11</td>
<td>2302</td>
<td>477</td>
<td>91</td>
<td>19.1%</td>
<td>Women in Science and Engineering</td>
</tr>
<tr>
<td>Cal-Davis</td>
<td>Peer 11</td>
<td>3003</td>
<td>483</td>
<td>82</td>
<td>17.0%</td>
<td>Women in Science and Engineering</td>
</tr>
<tr>
<td>Michigan State</td>
<td>Peer 11</td>
<td>3068</td>
<td>483</td>
<td>82</td>
<td>17.0%</td>
<td>Women in Engineering</td>
</tr>
<tr>
<td>NC State</td>
<td>Peer 11</td>
<td>6365</td>
<td>1086</td>
<td>165</td>
<td>15.2%</td>
<td>Women in Engineering</td>
</tr>
<tr>
<td>Minnesota</td>
<td>Peer 11</td>
<td>3807</td>
<td>845</td>
<td>123</td>
<td>14.6%</td>
<td></td>
</tr>
<tr>
<td>Illinois</td>
<td>Peer 11</td>
<td>6769</td>
<td>1220</td>
<td>177</td>
<td>14.5%</td>
<td>Women in Engineering</td>
</tr>
<tr>
<td>Ohio State</td>
<td>Peer 11</td>
<td>6115</td>
<td>891</td>
<td>129</td>
<td>14.5%</td>
<td>Women in Engineering</td>
</tr>
<tr>
<td>Iowa State</td>
<td>Peer 11</td>
<td>5626</td>
<td>866</td>
<td>116</td>
<td>13.4%</td>
<td></td>
</tr>
<tr>
<td>Purdue</td>
<td>Peer 11</td>
<td>7109</td>
<td>1083</td>
<td>142</td>
<td>13.1%</td>
<td>Women in Engineering &amp; Women in Science</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Institution</th>
<th>Category</th>
<th>Enrollment</th>
<th>BS Grads in Engr.</th>
<th>Female grads</th>
<th>%Female</th>
<th>Program Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kansas</td>
<td>Big 12</td>
<td>1790</td>
<td>302</td>
<td>74</td>
<td>24.5%</td>
<td>Women in Engineering</td>
</tr>
<tr>
<td>Oklahoma State</td>
<td>Big 12</td>
<td>2397</td>
<td>336</td>
<td>77</td>
<td>22.9%</td>
<td>Women in Engineering, Arch, &amp; Technology</td>
</tr>
<tr>
<td>Colorado</td>
<td>Big 12</td>
<td>3059</td>
<td>615</td>
<td>131</td>
<td>21.3%</td>
<td>Women in Engineering</td>
</tr>
<tr>
<td>Texas A&amp;M</td>
<td>Big 12</td>
<td>7429</td>
<td>1111</td>
<td>227</td>
<td>20.4%</td>
<td>Women in Engineering</td>
</tr>
<tr>
<td>Texas - Austin</td>
<td>Big 12</td>
<td>5575</td>
<td>985</td>
<td>191</td>
<td>19.4%</td>
<td>Women in Engineering</td>
</tr>
<tr>
<td>Oklahoma</td>
<td>Big 12</td>
<td>2524</td>
<td>346</td>
<td>63</td>
<td>18.2%</td>
<td></td>
</tr>
<tr>
<td>Baylor</td>
<td>Big 12</td>
<td>632</td>
<td>86</td>
<td>13</td>
<td>15.1%</td>
<td>Women in Science and Engineering</td>
</tr>
<tr>
<td>Iowa State</td>
<td>Big 12</td>
<td>5626</td>
<td>866</td>
<td>116</td>
<td>13.4%</td>
<td>Women in Science and Engineering</td>
</tr>
<tr>
<td>Missouri</td>
<td>Big 12</td>
<td>2264</td>
<td>398</td>
<td>49</td>
<td>12.3%</td>
<td></td>
</tr>
<tr>
<td>Texas Tech</td>
<td>Big 12</td>
<td>3231</td>
<td>481</td>
<td>59</td>
<td>12.3%</td>
<td>Women in Science and Engineering</td>
</tr>
<tr>
<td>Kansas State</td>
<td>Big 12</td>
<td>2979</td>
<td>394</td>
<td>47</td>
<td>11.9%</td>
<td>Women in Engineering and Science</td>
</tr>
<tr>
<td>Nebraska</td>
<td>Big 12</td>
<td>2776</td>
<td>430</td>
<td>49</td>
<td>11.4%</td>
<td></td>
</tr>
</tbody>
</table>

*2010 Data from ASEE College Profiles, Enrollment includes full and part-time students*
V. FUTURE DIRECTIONS AND CONCLUDING STATEMENT

Issues on the Horizon

For the next several years, PWSE can anticipate the financial situation for PWSE will remain tight. The state budget allocations for the general fund are not anticipated to grow anytime soon and if the ISU Foundation does work with PWSE to redevelop corporate contributions, those will take awhile to develop and grow to their full potential. NSF and other external funding agencies may be possible for some of the new initiatives; however, their financial support for on-going program is limited. In addition to the funding issue, at least for the next year, it is likely that PWSE will not be allowed to hire a dedicated part-time support position and will need to continue to function in a ‘staff sharing’ mode of operation.

The statewide STEM roadmap that was prepared for the governor’s office has been well received in concept by several stakeholder groups. Several recommendations within the plan could provide an opportunity to support or expand PWSE programming. Exactly what role(s) the PWSE staff or program might play in a more unified state effort associated with STEM are yet to unfold.

On the ISU campus, the new SP@ISU NSF grant has the potential to increase on-campus/internal collaborations with faculty and other STEM related programming efforts. Karen Zunkel is serving on the Advisory Council for this grant, which aims to better leverage all NSF funding at Iowa State to enhance the broader impact programming on campus.

Future Directions

During this next year, PWSE will be developing its next strategic plan. There are some areas from the current plan that will likely carry forward into the new plan:

- developing strategic partnerships
- providing high quality programs for K-14 and undergraduate students
- serving as a knowledge resource on women in STEM
- influencing systemic change within ISU and that State of Iowa that supports the success of women in STEM

However, specific strategies we use to support our mission and priorities may vary from the current plan. For example, PWSE envisions the need to research more fully and determine appropriate levels and types of programs to meet the needs of transfer students. This was a relatively new focus in the last strategic plan and PWSE staff members are still trying to figure out the appropriate mix of needs/services (or whether or not structured programs or services are even needed or effective).

PWSE will likely continue to invest time supporting diversity within the women/populations we serve. The transfer student population and racial/ethnic diversity are two areas where PWSE has focused efforts recently. However, there are other ways to enhance diversity efforts within the PWSE programming for
all students and other forms of diversity (e.g. undergraduate international women, first-generation women, women with disabilities, etc.) that are potential areas to investigate.

Concluding Statement

As a staff, the program review process provides us with the opportunity to step back and reflect on what we have done, are doing, and could be doing. As an office that is short-staffed, on a day-to-day basis we are very busy meeting the demands/needs of our students and constituencies. However, the review process and subsequent development of the next PWSE strategic plan gives us the opportunity for reflection and discussions; to make sure that we are spending our time and resources going forward in ways that will best help us meet our mission. The PWSE staff members look forward to the feedback from the review process and the discussions with administration, colleagues, and our advisory board as we continue to move forward.
APPENDICES

1. Degree Programs Served by PWSE
2. PWSE Strategic Plan
3. PWSE Tactical Plan (only available in electronic format of appendices)
4. PWSE Advisory Board Members
5. PWSE Collaborators/Partners
6. PWSE 2010-11 Budget
7. PWSE 2009-10 Actual Expenditures and Revenue Sources
8. Sample TRLT Conference Program
9. Learning Community Retention Analysis from Office of the Registrar
10. U St 201 Syllabus
11. Enrollment Charts by College