Iowa State University Review:
Program for Women in Science and Engineering (PWSE)

On March 31, and April 1, 2011, an external review team visited Iowa State to assess PWSE and provide feedback to the program. The review team members included:

- Beth Holloway (chair)
  - Director, Women in Engineering Program, Purdue University
  - Past President, WEPAN (Women in Engineering ProActive Network)
- Tricia Berry
  - Director, Women in Engineering Program, University of Texas-Austin
  - Past President, WEPAN
- Bevlee Watford
  - Interim Department Head, Engineering Education, and Director, Center for Enhancement of Engineering Diversity, Virginia Tech
  - Past President, WEPAN

The external review team was asked specifically to answer questions from PWSE and the PWSE Advisory Board and also share other observations / recommendations.

**Questions from PWSE and PWSE Advisory Board:**

1) *What progress has been made by PWSE on issues raised in the last program review?*

There were three broad issues raised during the last PWSE review in February 2005:

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

PSWE has reflected on these issues and put plans in place to address them. With regard to the clarification of PWSE mission, PWSE, with its Advisory Board, developed a clear mission.
statement, priorities, and a 5 year strategic plan. It is apparent to us that PWSE uses its mission statement, its priorities and its strategic plan to make decisions about program activities.

Data access is still an issue, and PWSE’s functional placement outside of an academic college exacerbates the issue. Until the university data warehouse is fully functional, data is not easily accessed, though PWSE has had some much appreciated assistance from the Office of the Registrar on an ad-hoc basis.

PWSE has been successful in creating partnerships for institutional change, while also continuing to provide student programming. The balance between these two areas is reflected in their mission, priorities and strategic plan. The partnerships that PWSE has developed are significant and impactful, and PWSE has been proactive in seeking out these partnerships.

2) What impact is PWSE having on the University mission and strategic plan?
Given that the institution is officially known as the Iowa State University of Science and Technology, the PWSE is a natural fit with the institutional mission. PWSE’s mission and priorities are in direct alignment with the University’s mission and strategic plan. The institution has as a strategic goal “Recruit, retain and graduate a diverse group of outstanding undergraduate, graduate and professional students…” which is directly impacted by the PWSE programs. Since PWSE’s mission and priorities are in such direct alignment, the high quality results of the PWSE programs and activities have a direct, positive impact on the University’s mission and progress towards its strategic plan.

Additionally, education and outreach are becoming increasingly important to the success of grant proposals, the increase of which is included in the University’s strategic plan. PWSE has in place an effective means of providing faculty with outlets that can be used to support their needs and enhance the probability of a proposal being funded. The involvement of PWSE in the SEEC grant is one such example. PWSE has collaborated with numerous faculty on other successful grants. Its value in enhancing the success of faculty grant funding can be directly measured through dollars awarded and contributes to the research and educational mission of the university.
3) *What success/progress has PWSE made on its 2007-2012 Strategic Plan?*

PWSE has made significant progress on its 2007-2012 Strategic Plan. This was made clear in the self-study documents provided to the external review team, and reinforced by surveys of the perceptions of the faculty, staff, partners, alumni, administrators and of the female undergraduate STEM students. PWSE has clearly used its Strategic Plan to guide its programs, activities, and resource allocations.

4) *How well does PWSE meet the needs of pre-college and undergraduate STEM students?*

PWSE efforts focus primarily on STEM outreach to pre-college students and retention of first year, second year and new transfer STEM students. Students in the recruiting window (rising high school seniors considering where to apply and/or which college or university to attend) as well as students beyond the second year at ISU are currently not served to the same extent. The chart below shows a typical service continuum for women in STEM programs, highlighting in red those areas where PWSE is actively engaged.

*Pre-College*

In the pre-college space, PWSE excels at serving the state of Iowa, exciting girls about STEM fields. The Taking the Road Less Traveled (TRLT) conferences are known across ISU as well as across the state. TRLT and the Role Model program provide access to STEM role models, information about STEM careers and a spark of excitement for kids to consider STEM pathways in the future. These programs are considered vital to ISU’s mission and the PWSE is considered an expert in STEM outreach.
The TRLT conferences are excellent visibility for the University. On campus, the PWSE program is best known for the Taking the Road Less Traveled (TRLT) conferences. The program seems to have great support from campus faculty and staff. The faculty and staff that we talked to recognized the importance of the conference in educating pre-college girls about the possibilities in STEM fields. The conference attracts several thousand girls each year, and we have heard that there are teachers in the state who bring their students to the conference each year. As such, the conference brings excellent visibility to the ISU campus as a whole.

However, several of the current undergraduate students who attended the TRLT as pre-college students did not know until quite recently that the conference was hosted by the PSWE program. While the conference is visibility for the university, it is not visibility for PWSE. It does certainly provide pre-college girls with exposure to STEM occupations. But when 83% of middle school participants are interested in STEM before the conference, it is not clear that this conference is broadening interest in STEM careers among girls, one of the stated priorities of PWSE. If the conference is not significantly increasing interest in STEM among pre-college girls, and it is not providing visibility for PSWE and the support that PWSE provides students when they enroll at ISU, is the very positive outcome of creating visibility for the university adequate reason for the PWSE program to continue to use its limited resources (both staff and funding) to host this conference?

PWSE does not proactively recruit high school students to ISU; however PWSE has a strong collaboration with the Office of Admissions to support student recruitment. PWSE has a daily standing appointment time where prospective female students and their families can visit with PWSE staff and learn about the programs designed to support their success as a student. PWSE is invited to various admission visit days and they have a booth to distribute information and talk with prospective students. Admissions advertises PWSE through a standard mailing. TRLT is viewed as a recruiting program by both ISU Admissions and administration, even though the focus, assessments and participant follow-up are not strategic to recruiting students into STEM fields at ISU. PWSE is open and available to serve high school students, but does not have the current resources and capacity to actively and strategically engage in the high school recruiting
process. PWSE is actively involved in interacting with admitted students through orientation and the advising process, seeking to engage students in the PWSE learning communities.

*Undergraduate*

PWSE is an integral part of the 1st year student experience and provides well recognized and respected support through the PWSE Learning Communities. Undergraduate students are aware of the programming available to 1st year students and see the value of being involved. Students are less informed about the newer 2nd year and transfer programs, but those involved understand the value of the opportunities and feel supported by PWSE. Students felt there were fewer opportunities the further removed they become from their first year at ISU, however they appreciate the career visits, opportunities to work in the PWSE office and opportunities to mentor students coming behind them.

The WiSE First Year Learning Communities for women in STEM majors are well-populated and well run. The students in the LC’s liked meeting and getting to know other women majoring in STEM, even if they are not in the same major. They indicated that being part of the LC helps them be retained to STEM majors. The data shows that WiSE participants are twice as likely to stay in STEM as other women in STEM at ISU. Participants really enjoyed having a peer mentor, and the peer mentors tended to be previous participants, excited about being a resource for other students in the way their peer mentor was for them. The tutoring provided by the program is also appreciated and sets the participants up for success.

While recognized as critical populations for impacting retention of STEM majors, both sophomores and transfer students are underserved populations across Women in Science and Engineering programs nationwide. Second year and transfer students are a challenge to engage in programming and PWSE is working to engage them in Learning Communities, outreach programs, mentoring initiatives and the classroom. Students want additional interaction in the 2nd year and beyond and PWSE is in a unique position to serve them, assess the efforts and share best practices and lessons learned with their peers and the broader engineering education community. Expansion in this area cannot be done without additional staffing resources as programming could be at least as extensive as that for 1st year students.
Students expressed interest in feeling more connected across the university to others in STEM fields. They feel connected to their specific communities, but felt there would be great value in some cross-discipline socials or interactions. They also wish more of their peers would participate in PWSE activities and feel like there are great resources available through PWSE that others need to know. Students expressed that at times it feels like PWSE is more engineering-focused, but they also felt like engineering students have a greater need and perhaps there are easier connections to the engineering college and companies than with other majors. They feel like they don’t always have the information they need or desire regarding opportunities to engage with PWSE or across campus and feel a bi-weekly or monthly PWSE eNewsletter might help with communications and connections.

Leadership and professional development opportunities afforded to the students because of their participation in PWSE are outstanding. Students have the opportunity to serve as role models, mentors, program coordinators and leaders in a variety of ways with PWSE. They can participate as leaders, receive training, and gain experience with TRLT or the Role Model program, the PWSE Learning Communities and other PWSE initiatives. Students also enjoy and learn a lot from the career visits program and appreciate the time consuming aspect of this PWSE initiative. These types of leadership and professional development opportunities directly impact retention and graduation rates in STEM majors and one advisor referenced the “amazing transformation in confidence” of ISU students who serve in these PWSE roles.

5) Is PWSE efficiently prioritizing the use of its resources? Does PWSE have the necessary resources to meet expectations today and in the future?

PWSE has very knowledgeable, respected, dedicated, hard working, efficient staff. There is a great fit between program needs and staff skill set. The PWSE staff is seen as a knowledge resource on campus and respected for providing high quality programming. As a whole and individually, they possess the skill sets needed for the programming that the office offers. The reach of their programs given their staff size is impressive and speaks to the dedication and work ethic of the staff.
PWSE focuses in on those areas of greatest need, visibility or value given their limited staff and funding resources. While PWSE has made programmatic cuts and continues to evaluate impact of various initiatives, continued focus and further programmatic cuts are likely necessary as current staff cannot sustain the current level of program coordination with added administrative responsibilities.

PWSE has extraordinary pressure to continue programs and services that benefit the state and the university with limited resource support (funding, fundraising, staffing). PWSE does not have the resources to fill the state and university’s need and desire to continue pure outreach efforts like TRLT or the Role Model program without creating a visible and strategic connection to recruiting and retention of female STEM students at ISU. With limited resources, outreach for the sake of outreach has to seriously be evaluated. These types of programs are incredibly important, however they are the least tied directly to the university and PWSE’s aim to graduate more women in STEM fields.

PWSE is able to effectively use its resources to serve 1st year students, but without additional staff support or graduate student support, services for 2nd year, transfer, and upper-class students will continue to limited. To increase retention of female STEM students and to further enhance career and leadership skills and connections, additional resources to serve these audiences will be needed as the current PWSE structure (staffing, funding, etc.) is beyond capacity.

6) **What impact is PWSE having on Iowa?**

PWSE is a recognized outreach expert and powerhouse by all familiar with the TRLT and Role Model programs. Repeatedly students, faculty, staff and administrators expressed the value of these programs to the university and to the entire state of Iowa. By reaching all counties of the state and having such a recognized outreach program such as TRLT, PWSE is reaching girls at a fantastic rate to excite them about STEM and STEM careers. PWSE’s impact is well known and extensive given that others in the university and other Iowa institutions intentionally do not offer similar outreach programs because of the success and notoriety of TRLT and the reach of the Role Model program. Additionally, the Director of PWSE is involved in several efforts at the
state level, such as being on the writing committee for the Iowa STEM Education Roadmap – Strategic Plan, furthering the impact of PWSE on the state of Iowa.

7) *Is the PWSE Advisory Board effectively supporting the needs of the program?*

The current advisory board, composed of both internal and external members, strongly supports the PWSE efforts. They have been a source of thoughtful deliberation on several fronts, most particularly in evaluating various PWSE programs and determining how they do, or do not support the overall mission. They have advocated on behalf of PWSE with university administration and raised concerns on the impact of budget reductions.

The mix of internal and external members is a somewhat different model than what is normally seen in advisory boards. The Review Team believes that a university wide internal advisory board would be of great benefit to PWSE. The visibility of the PWSE programs is an issue; the majority of faculty and students seem to be aware only of the specific program in which they are involved. The knowledge and awareness of PWSE programs and outcomes in general was inadequate. Developing an internal advisory board with representation from a broad constituency can help improve program visibility. This could also aid in the advocacy arena by including members who are in positions to influence budget and other issues.

*Recommendation:* *Create a university wide internal advisory board to promote the visibility of PWSE on campus.*

8) *How does PWSE compare to programs at peer institutions?*

It is difficult to provide a comparison of PWSE and other institutions. In general, the broad STEM focus and the fact that the Director reports to the Office of the Executive Vice President is somewhat unique. The programs offered are consistent with what is typically provided by a program supporting diverse groups (mentoring, residential communities, outreach activities). The relationship between PWSE and the Office of Admissions is outstanding and a model for other institutions.
The split focus of the Director’s position is not something commonly found, particularly given the large size of the institution and the population being supported. The impact of budget cuts is felt everywhere and is requiring institutions to focus on their core values. The PWSE mission is in direct alignment with the institutional mission and therefore strongly supports the institution’s core values.

PWSE has a unique and successful outreach model with extensive reach and statewide recognition with TRLT. This model is a great candidate for dissemination to other universities or informal STEM providers such as museums or the Girl Scouts in other states. By documenting and disseminating the coordination process, impact data and extensive reach of TRLT, PWSE will quickly be recognized as a national leader in how to do outreach to engage girls in STEM fields.

While relatively new for PWSE, the PWSE transfer student learning community and transfer student programming are a unique support programs for transfer students. PWSE has the opportunity to establish itself as a national model and/or expert in engaging female STEM major transfer students by documenting its program, collecting impact data, and disseminating results throughout the Women in Science and Engineering and broader engineering education community. To become a national leader, however, additional staffing resources will be required to fully implement transfer student programming and to conduct the assessments required to continuously improve, expand reach and impact retention.

9) How can the University more effectively support PWSE?

As previously mentioned, PWSE needs an advocate in a position that can influence budget decisions. This, coupled with the creation of a University Advisory Board composed of administrators throughout the STEM programs would positively impact the visibility of PWSE and its programs. PWSE has already effectively aligned itself with funding proposals from faculty, for example the SEEC program. Promotion of the office, perhaps through providing information to new faculty as to how PWSE can collaborate with them for their education and outreach efforts would also be facilitated.
The loss of support personnel has not been effectively addressed and the remaining staff are stretched very thinly.

**Areas of Concern**

**Advocacy**

PWSE needs an advocate. Every sub-unit within an organization needs to have advocate at a higher level, preferably at a level of organizational leadership. When decisions are being made on issues of, for example, space and budget, it is imperative that this advocate be at the table to speak to the needs of the sub-unit. In every single meeting during the PWSE review, no one seemed to know who advocated for PWSE within the University leadership team. At one point Susan Carlson was a program advocate, but no one has stepped into that role following her departure. This leads the review team to conclude that PWSE does not have an identifiable advocate.

An advocate can also assist with increasing the level of PWSE visibility within the University. Numerous conversations with various faculty, staff and students indicate that the impact of PWSE activities in not widely known or appreciated.

*Recommendation: So that PWSE can be successful, visible, and fulfill its mission and strategic plan, as advocate for PWSE must be identified who will promote PWSE and advocate for resources on PWSE’s behalf.*

**Fundraising**

Because PWSE is a university level office, they do not have support from the college fundraisers. It is our strong feeling that many companies would support the efforts of PWSE if they were asked to do so. Some time ago, the ISU Foundation decided to focus on larger corporate gifts and not on gifts at the level that PWSE was receiving. Additionally, PWSE was not allowed to approach corporations on their own. The external review team asked to speak with folks at the Foundation about the situation. They were very open to asking companies to
support PWSE, and were willing to work with PWSE to come up with a plan for annual giving and corporate support. PWSE would be allowed to directly ask companies for support, working with the Foundation. The Foundation team also said that they would take the lead in asking companies to support PWSE if it was made a priority by the administration.

**Recommendation:** PWSE needs to work with the ISU Foundation on a plan for annual and corporate giving. PWSE needs to be made an explicit priority for fundraising at the University level, particularly if the centrally supported budget will continue to shrink.

**Administrative Support**

While shared resource models make sense in theory and on paper, the reality is that sharing administrative support with an office that is located in a different building and at a higher administrative level is not working for PWSE. Administrative work is often challenging to plan out in advance and prepare for someone else who is not intimately involved with the program. Because so much of program coordination happens on the fly and must be nimble enough to react and respond as questions or issues come up, PWSE staff have found the administrative support model ineffective and inefficient. In addition, because PWSE is sharing these resources with a higher administrative level office, PWSE is not a priority and support work gets bumped. PWSE staff were quick to share that the administrative support personnel are supportive and sympathetic, but the shared staff are also in a bind as they are unable to commit to the level they know is needed to complete PWSE tasks. PWSE staff have resorted to doing more administrative functions internally, avoiding seeking out the shared administrative help as it takes more energy and more time than PWSE staff currently have. However, by PWSE staff dedicating their time to administrative efforts such as shopping for supplies, PWSE staff are limiting their time for efforts that truly impact the reach to girls across the state or the retention and graduation of female STEM students.

**Recommendation:** For PWSE to continue their efforts at the same level as they have done and to expand the needed reach to serve 2nd year, transfer and upper-class students, dedicated administrative support will be required.
Resource Limitations

We believe that the centrally located PWSE program works well for the ISU campus in meeting the needs of ISU women in STEM. But restrained resources (both in terms of staff and funding) may require a reflection of their best use of resources.

Recommendation: We recommend some strategic thinking around how to meet the needs of the students within resources available. Perhaps some programs that have majority female enrollments and those that are starting their own efforts to support their women students should be supported in a different, less resource driven way than students in other departments. We also suggest leveraging the support of departments who are interested in supporting the needs of their female students. This may free up some resources to provide support across the undergraduate spectrum. Many of the students we talked to expressed interest in having more programmatic activities for juniors and seniors to connect to each other.