

Creating AWESOME: Faculty vs. Student Views for an Organization

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Abstract

AWESOME (Association for Women Engineers, Scientists, Or Mathematicians Empowerment) recently began at our university as a way to bring together female students and faculty on campus for mentoring, networking, outreach, speaker events, and professional development. Unlike most national organizations, AWESOME includes members from a wide variety of STEM fields and is an ideal structure for smaller universities and colleges. This paper provides an overview of the formation of this inclusive and diverse STEM organization. Additionally, this paper will discuss the drawbacks and benefits of having a heavily involved faculty component to a student organization.

Unlike a typical student organization on campus that has one faculty advisor, AWESOME has several extremely involved faculty members. The faculty developed a list of priorities encompassing the needs of multiple disciplines but this evolved as student members added opinions and experiences. Priorities included: (1) creating a space for the group, (2) introducing strong female role models, (3) creating a peer network, (4) professional development, and (5) participating in outreach events. The student members were interested in professional development and participating in outreach events, but they had a strong desire to have social and fun activities on the AWESOME agenda. AWESOME began as a faculty led endeavor, but in the second year has been transitioning to becoming a student driven organization.

Background

AWESOME (Association for Women Engineers, Scientists, Or Mathematicians Empowerment) began at West Virginia University Institute of Technology (WVU Tech) during the Fall of 2014 and has been an active student organization in the WVU Tech community for almost 2 years. AWESOME was designed to be not only a student club/organization but also have an active faculty organization. These two groups work together to benefit not only the women at WVU Tech, but the entire community. The organization was proposed, developed, and supported by all the female STEM faculty currently working at WVU Tech. The female faculty members wanted

to create an organization to bring the women in STEM at WVU Tech together for support, outreach, and collaboration.

The Leonard C. Nelson College of Engineering and Sciences at WVU Tech has slightly over 500 students and 45 faculty members. Currently, the college has 22% female faculty and 18.7% female students. Nationally 19.2% of engineering degrees, 18.2% of computer science degrees, 58.2% of biosciences degrees, and 43.1% of mathematics degrees are earned by women¹. At WVU Tech, 46.4% of the female STEM students are in biology and chemistry, with the remaining 53.6% disproportionately spread among mathematics, computer science, information systems, and the engineering and engineering technology disciplines, often resulting in only one or two female students in a department. Four engineering departments have no female faculty, compounding the feeling of isolation among female students, which is a primary reason for students leaving engineering². Informal student-faculty interaction has been shown to reduce attrition by increasing student engagement and performance³, with one study showing a higher impact on female students⁴. Additionally, faculty support and encouragement of co-curricular activities are shown to promote student learning and improve student satisfaction⁵. Specific recommendations for active support of women in STEM fields include creating a women in STEM organization, creating a student lounge for contact outside of class, and providing social activities for female STEM students⁶.

Our faculty decided to create a student organization to actively support female students in STEM fields. Beginning/re-starting a chapter of the Society of Women Engineers (SWE) was considered by the faculty, but was rejected given that the focus of SWE was solely engineering. We felt that non-engineering students would not feel welcome and would assume that the organization was not of interest to them. The faculty searched for an existing organization that encompassed all of the STEM fields, but was unable to find such an organization. Therefore, it was decided to create a multidisciplinary organization that welcomed students from the science, technology, engineering, and mathematics fields. AWESOME is, therefore, an inclusive organization for all the STEM fields, and encourages all members to join student and professional organizations that are specific to their field.

AWESOME (or similar organizations) are ideal for smaller university or college environments. As individual departments would be unable to sustain field-specific female-based organizations, this umbrella organization allows the WVU Tech community to enjoy the same benefits that field-specific organizations would supply. The multidisciplinary nature of AWESOME has created interesting collaborations and alliances. Some examples are: faculty collaboration on course delivery, faculty collaboration on research, and student organizations developing and running joint events. The wide range of fields represented in AWESOME has enhanced the organization's objective to participate in outreach activities to recruit future generations of women in STEM. Active members of AWESOME represent the following STEM fields: Chemical Engineering, Biomedical Engineering, Computer Science and Information Systems, Mechanical Engineering, Electrical Engineering, Mathematics, Biology, Industrial Engineering, and Engineering Technology. Therefore, AWESOME is able to provide a wide variety of activities and participants in outreach are able to interact with a variety of women interested in a variety of fields.

Structure of AWESOME

As mentioned in the introduction, AWESOME contains both a student and a faculty group. AWESOME is an officially registered student organization and has four student officers (president, vice-president, treasurer, and secretary). The student organization has both a constitution and bylaws spelling out the details of how the student organization runs on a day-to-day basis. There is only one officially listed faculty advisor for the student organization because of the university student organization rules. All of the female faculty are considered part of the faculty AWESOME organization, and many act in various capacities as faculty advisors to the student organization. The faculty organization is less structured (no official officers) and operates very much on an as-needed basis. A core group of four female faculty regularly attend AWESOME student meetings and work directly with the students. Other faculty work with AWESOME as their schedules allow and for larger events. The focus for the faculty group is to support the student organization including: using connections to arrange for guest speakers, writing grants and otherwise seeking funds, organizing professional development, and organizing outreach opportunities.

AWESOME membership is open to any student or faculty, regardless of gender. AWESOME sponsored events and activities are always open to the WVU Tech community and membership is never required. With the exception of a few speakers and events, most sponsored AWESOME events and activities are not geared to being a female in STEM and are on topics that could interest almost anyone in the STEM fields. AWESOME has regular (weekly/bi-weekly) membership meetings and tries to do at least one event or activity every month. Events can vary in size from a small group to a large assembly, and encompass a wide variety of interests. Examples of activities from the last year and half include: painting canvas rugs for the AWESOME clubroom, guest speakers from STEM fields, holiday pizza and popcorn party with tower building competition, mock interviews, 30 second elevator speeches workshop, resume workshop, doing STEM activities at Girls' Day at the Legislature (and other similar outreach opportunities), having a table during open house events, sponsoring an egg drop activity for Campus Cup during homecoming, and making giant bubbles on the campus green space.

Of the various activities listed above, the academic and professional development activities have been faculty planned. The social activities have been primarily student planned. Faculty have been primarily responsible for contacting and arranging for guest speakers. The professional development activities (e.g., mock interviews, 30 second elevator speeches workshop, resume workshop) were faculty planned and lead. The outreach opportunities are often faculty driven, but with significant assistance in both planning and execution of the students. The students wanted to have more social events, and planned a series of fun, active STEM challenges with food and snacks available.

The Priorities of AWESOME

During the planning stages (and throughout the first year), the faculty group developed a list of priorities for activities and projects. Once the student group was created and officers were selected, the students create their own list. Together, the groups have been working to merge the lists and

fulfill as many of these desires as possible. The result was a fairly lengthy and diverse list of activities and projects including the following:

1. Create a space for the group
2. Participating in outreach events
3. Introducing industry/external role models
4. Promoting faculty/student interaction
5. Creating a peer network
6. Professional development

This paper will discuss why each of these objectives was considered a priority and how AWESOME fulfilled the objective. Additionally, this paper will discuss how the priority list has updated and evolved each year as the organization fulfilled its goals and created new ones. As priorities have been addressed, AWESOME was seeking new goals and looking for ways to improve student and faculty experiences. To gather the opinions of AWESOME's goals by our constituents, the authors asked STEM female students and faculty to answer questions about AWESOME's activities and to list their priorities for AWESOME. Response rate for the survey had four faculty members and seven students complete the survey. The responses from the survey were compiled and compared to the original priorities identified almost two years ago.

Creating a Space for the Group: The AWESOME Room

The first priority for both groups was to design the AWESOME room as a welcoming space for the students to hold meetings and study between classes. The organization (using funding received from Toyota of West Virginia) purchased new furnishings and redecorated to complete reform the room. Initial planning and design options were developed by several of the faculty advisors to select options that satisfied university rules and restrictions. From these options, the students selected the paint color and furniture for the room as well as the arrangement of the furniture whiteboards/projection screen.

As recommended by⁴ and to help students feel less isolated², the room has provided a setting for informal interactions among the female students. While the space is used for scheduled meetings and events, it has also become a location for students to study and relax between classes and is a frequent meeting location for team projects and study groups. At this point, the AWESOME room is considered complete by both the students and the faculty members and no students or faculty listed the space as a priority in our recent survey. However, we believe that the AWESOME room is likely to continuously change over time as an ongoing project for the organization, but one with a very low priority.

Participating in Outreach Events: Recruiting Future Generations of Women to STEM

Immediately after its creation, AWESOME began participating in outreach events both on and off campus (see Table 1). Outreach events ranged from short hands-on activities at large events to longer projects in K-12 classrooms and on-campus visits. AWESOME has actively participated in ongoing outreach projects at WVU Tech and has begun working on several new projects focusing specifically on recruiting women into the STEM fields.

AWESOME originally ranked outreach as its second priority, in part because it is a priority for the college and because several opportunities for outreach to girls were available during AWESOME's first year such as partnering with the Girl Scouts and the first annual Girls' Day at the Legislature. Students active in the organization as well as students who are peripherally involved have been extremely excited to participate in outreach events and share their love of STEM fields with the community. Our science majors, while not heavily involved in the routine meetings for AWESOME, are actively involved in outreach. We have a much higher rate of participation from our female students at outreach events focused on introducing girls to any aspect of STEM than at discipline specific outreach events. Outreach continues to be a high priority for AWESOME although faculty members consider it a higher priority than students (2nd to 6th in our survey). Despite the lower overall ranking by the students, it is one of the few areas identified as a priority by most of our students and events continue to be popular with student members.

Table 1: AWESOME Outreach Activities

Event	Faculty and Student Participation	K-12 Student Participation
Community Events		
STEM Activities at Community Event	7	1000
Discover Engineering Day	8	500
Girls' Day at the Legislature	12	200
Classroom Visits		
Girl Scouts	12	30
1 st 5 th Grade School Visit	9	45
2 nd 5 th Grade School Visit	2	30
High School Visit	4	15

Introducing Industry/External Role Models: The AWESOME Speaker Events

AWESOME's third priority was to host external speakers who gave formal presentations to students and also hosted question and answer sessions after their presentations. To provide students with role models beyond the WVU Tech community, faculty invited women from a range of STEM fields to campus to speak with WVU Tech students and faculty as summarized in Table 2. Light refreshments are served before and after the presentations to allow the guest speakers to have informal discussions with the students outside of their presentations. As mentioned before, many of the female students are in departments without female faculty, so external speakers provide them with the opportunity to obtain mentoring from women in their respective fields. The speaker events were highly attended by the female faculty and somewhat popular with students, even though they are not a priority particularly identified by students. Providing external and industrial role models for the AWESOME students continues to be the third ranked priority by the faculty but is the lowest ranked priority (7th) for the students. However, students rank mentoring with alumni as their highest priority for the future of AWESOME. We see this as an outgrowth of the speaker events, with a more long-term

relationship for students and alumni in their fields. We are working with the WVU Tech alumni office and association to identify alumni willing to serve as mentors to students. Many of our non-local alumni have expressed a willingness to interact with students via skype or e-mail.

Table 2: AWESOME External Speaker Events

Event	Total Participation
AWESOME's First Mix & Mingle Guest Speaker: Automotive Industry	26
Guest Speaker: Chemical Engineering	20
Women on the Move Event	17
Guest Speaker: Computer Science	6

Promoting Faculty/Student Interaction

One of the original priorities of AWESOME was to provide more opportunities for informal interaction between female faculty and students to help increase student motivation and retention in the STEM fields³. These interactions occur during meetings, competing in AWESOME STEM challenges, while preparing for events, travel to and from outreach events, and dinner after events. AWESOME competed in the 2015 Campus Cup with a different competition each evening one week and five faculty competing alongside the students. Faculty are able to talk to students about a variety of topics, including non-academic ones. In the survey, students requested more causal events for students and professors and ranked faculty/student interaction as their third highest priority. Faculty have ranked interaction as their number one priority and report that AWESOME has provided increased opportunity for faculty/student interaction.

Creating a Peer Network: Social Activities

The students' second priority (and faculty's fifth) at AWESOME's start lay in creating a series of challenges and activities at AWESOME meetings to explore concepts from across the STEM fields. The students wanted to have more "fun" activities as listed in Table 3 while advertising the organization while getting to know other students. These events provide a platform for peer networking as students from STEM fields across campus have the opportunity to meet and interact. Students are able to discuss courses, possibilities of graduate school, and internships as well as difficulties they have faced. A common theme in surveyed students was that AWESOME helped them feel more comfortable on campus and reminds them they are not alone, helping to decrease feelings of isolation². Surveyed faculty rank peer networking as their fourth priority but it has fallen to the seventh priority for students, perhaps because many of them report attendance at AWESOME events over the last two years.

Table 3: AWEOME Social Activities

Event	Total Participation
Pizza and Tower Building	11
Outreach Prep Sessions	6
Chromatography AWESOME T-Shirts	10
Making Giant Bubbles	21
Egg Drop & Campus Cup	8
Rug Painting	6

Professional Development: The AWESOME Professional Development Series

One of the priorities identified by both faculty and students when founding AWESOME was to create a series of professional development workshops targeting female STEM students such as salary negotiation, work/life balance, and dress codes. However, a sudden vacancy in the career services department led to a lack of any professional development activities on campus. Faculty from AWESOME worked over the summer with Student Support Services and the alumni office to create a more general professional development series summarized below in Table 4. These workshops were presented early in the fall 2015 semester and were designed as a lead in to the fall engineering and sciences career fair. Near the end of the fall semester, AWESOME student members planned and developed a fourth professional development event: LinkedIn Profile Pictures.

The vacancy in Career Services was filled at the end of 2015, and that office will be taking over the planning of these workshops, including those targeting female students. AWESOME is working to develop future workshops focusing on the application process for professional and graduate school. The survey showed professional development as a continued priority for only half of the faculty, who ranked it as a lower priority. However, it is the only priority listed by all surveyed students, and the workshops are popular with students who are not regular members of AWESOME as well.

Table 4: Professional Development Workshops

Workshop	Student Participation
Resume Building	18
30 Second Elevator Speech	16
Mock Interviews	16
Linked In Photo Event	14

New Student Priorities: Attending Conferences for Women in STEM and Creating Local Chapters of SWE

Our surveyed students ranked attending conferences for national organizations such as SWE as a major priority for the future of AWESOME. The AWESOME organization only exists on a local level and our students are very interested in meeting female students from other universities. They are also interested in the professional development and career opportunities offered at these conferences. Furthermore, students identified creating a local chapter of SWE as a future priority

for AWESOME. A SWE member in the area has recently been in contract with the faculty of AWESOME wishing to restart the student chapter and creating a local professional chapter. The plan is for these two groups to interact on a regular basis providing mentorship opportunities (a priority re-identified by both the students and faculty) and possibly joint outreach projects (a continuing priority of all AWESOME members).

Future Work and Concluding Remarks

AWESOME has achieved progress on most of the priorities identified by the faculty and student members. The inaugural year was extremely faculty-driven and the second year has seen transition into a more student-run organization. With this leadership transition, AWESOME will also see a transition in priority focus. In the first year, the priorities satisfied were predominately the faculty identified issues. AWESOME is the new organization on campus and the older female students were already involved in other student organizations and professional organizations in their fields. Therefore, the officers in AWESOME have primarily been younger students. As the officers have matured, gained experience, and taken a more active role in the organization, their priorities, and methods of satisfying these priorities, have dominated the agenda. The results of our student survey showed a lack of uniformity in the student priorities; the faculty will work with the officers to focus their goals as a group instead of as individuals.

As the organization goes forward, AWESOME hopes to partner with the alumni association and other external sources to increase the mentoring opportunities for the membership. AWESOME hopes to continue to expand the outreach activities targeted at females. These outreach activities provide opportunities for students and faculty to meet other women with similar interests. Speaker events and social activities have begun to build both the mentoring and peer networking, and we feel that this will continue as the organization ages. AWESOME is also looking beyond the students' years at college by helping to prepare them for the future with professional development and will continue these efforts with more focused events for AWESOME membership. With the first priority of the AWESOME room being nearly complete, the organization is prepared to take on new priorities identified by both faculty and students.

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