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The Impact of Volunteering at a Girls Outreach Activity on Community Formation

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The Impact of Volunteering
at a Girls Outreach Activity on Community Formation

Abstract

This paper is focused on exploring the motivation for volunteering at an engineering outreach activity. The outreach activity itself involved a two day, overnight experience for 9th and 10th grade girls that started in 2005, and which has been held annually since that time. The outreach event takes place in Boise, Idaho, and at the time of its onset was the only outreach or camp activity in the state focused on girls or young women. Across ten years, 510 total girls have participated, with approximately 85% of them coming from the immediate metropolitan area. The program was developed with a mind toward marketing engineering as an exciting, creative activity; including activities developed specifically from that perspective.[1] The specific topic of this paper is an investigation into the motivation for volunteers and students to support this program. Our hypothesis is that, in particular, the women found this an experience that helped to create community among like-minded STEM focused professionals and students.

An anonymous survey was used to collect information from the 188 individuals who helped support the program across the past ten years. This includes people from local industry, and faculty, students and staff from the university (some of the student staff were paid and some of the university staff participated as part of their work duties; all others were volunteers). Survey participants were asked to identify themselves as primarily being a student, faculty or staff at the associated university, professional employed in the region, or other. In total, 67 people responded to the survey. Across all respondents, 55% were students, 12% were faculty and 5% were staff at the university; and 25% were from outside the university. The results from the survey include their motivation for participation, and reasons for participating during more than one year if applicable. Survey results also include information reported concerning formal and informal interactions between volunteers, and information concerning opportunities for interactions with other professional women that are available. Finally, respondents' reported on how they may have benefited from their participation in the engineering outreach activity together with advice they have to help improve the volunteer experience are presented. This paper will report on the results of this survey and will discuss the implications of these results.

Introduction:

The idea for a high school girls-only science, engineering, and technology camp in Boise, Idaho was initiated by a science and technology teacher from a local high school who was concerned about the lack of girls in technology classes. At the time, at Boise State University, female enrollment in engineering and computer science comprised only about 12 percent of the undergraduate population. The teacher applied for a grant from a corporate foundation and then partnered with the local section of the Society for Women Engineers (SWE), other high school staff, the corporation, and Boise State University. In 2005, the first camp was offered to 41 girls, recruited through the deliberate deployment of marketing strategies to determine themes that would interest young women in the region, and to promote the camp.[1] In designing the camp, the needs and interests of teenage girls were identified first. Our planning team identified these top three factors: 1) they (teenage girls) had little contact with women in engineering fields, 2) they are flocking to professions where they feel they can make meaningful contributions to society, medicine, justice, and prosperity, and 3) they do not want to work in a cubicle, isolated from other people. Taking into account the general needs and interests, four message themes were developed as guiding principles: 1) Engineers help the world, 2) Engineers think creatively, 3) Engineers enjoy working with others, and 4) Engineers earn a good living. Finally, methods to achieve the messages were selected that included: enabling teamwork, having women staff at all levels, emphasizing a variety of careers creating active/hands-on fun, and providing academically challenging modules. Thus, from the start, we emphasized community. We deployed women staff at all levels – near peers (students enrolled in college), graduate students, women who work in the college, and women who work in the local area as engineers. We emphasized community building among the cohort. And we embedded undergraduate students in the camp, using a peer mentoring approach. These peers were paid for their contributions, and slept, ate and participated in activities with the girls, in four teams of about ten each. Note that although the students are paid for their contributions, this is not a significant sum, so we consider them part of the "volunteer" staff in the analysis presented in this paper.

Since 2005, the camp, called E-Girls, has been offered annually. Based on annual feedback from girls on the activities they like the most, we have "tweaked" the activities each year, eliminating some, adding new ones based on the volunteering faculty and professional staff, and repeating the favorites (e.g. the Physics of Rock Climbing and Slack Lining), but the overarching approach of enveloping the girls in community, including undergraduate girls on up through professional women has been faithfully maintained. E-Girls remains an activity that receives significant support from a volunteer base in the community, including women from SWE and others who volunteer. It is organized annually by the Boise State University College of Engineering and funded through a combination of corporate and foundation sponsorship internal funds from the College of Engineering. E-Girls has now reached a total of 510 girls, with approximately 85% of them coming from the immediate metropolitan area. The camp's activities involve numerous volunteers, many of which return, year after year. In all, about 25 staff and volunteers (about 75% women) help in some way, each year. Across ten years, the total volunteer base has grown to nearly 200 individuals who have supported the program in some way, including students, community members and members of the regional workforce. The facilitators generally enjoy

the camp as much as the girls and find the teens to be inquisitive, creative, enthusiastic, and open-minded.[1]

This paper is focused on investigating the motivation for volunteers and students to support this program. Our hypothesis is that, in particular, the women found this an experience that helped to create community among like-minded STEM focused professionals and students.

Literature Review:

Peer Mentoring and Community Development

Peer mentoring and alternative mentoring models have proven to be effective methods for improving community and providing social support for women in the sciences. Mentoring provides women support and encouragement in their careers and academic circles and has been identified to be one of the primary ways to address limited participation of women in STEM.[2,3] Kram's framework on peer mentoring identifies two critical functions of peer relationships: peer mentors provide individuals with career-enhancing functions and psychosocial support. According to Kram, mentors aid mentees with career advancement, coaching, protection from risk, and by increasing their exposure to social networks.[4] The psychosocial functions include offering counseling, friendship, role modeling, and communicating acceptance.

Peer mentoring has repeatedly been shown to have a significant positive impact on women's professional and personal lives.[2,3,4] Chesler found mentoring programs for women in STEM can have positive impacts on career advancement and offer women role models and support networks. Peer mentoring helps women leaders build community, solve problems, and combat feelings of isolation, and it has also been shown to improve women's confidence in their skills and abilities.[5,6]

Mentoring Circles

Mentoring has traditionally been described as a dyadic relationship between an individual with advanced experience and a younger protégé.[4,7] Kram first asserted that women benefit from a network of relationships, rather than the traditional model of mentoring, and that they benefit from multiple types of mentoring simultaneously. [4,9] Alternative forms of mentoring can involve two or more persons of equal status and can resemble small or large networks. Group mentoring or mentoring circles create many different perspectives among group members and leverage combined experiences to complement and enhance individual knowledge.[3,8]

Reported advantages of mentoring circles include: knowledge acquisition, better understanding of the culture, academic demystification, increased confidence and commitment, career progression, and greater connectivity. Peer mentoring circles build self-esteem and offer participants flexibility. Participants can determine their level of commitment depending on the demands of their professional and personal life.[10] Peer mentoring groups can provide "elastic support networks when support is needed."[10]

Darwin's study showed one major motivation for participating in peer mentoring circles is the desire for career development. Their research also indicated that mentoring circles offer women a

space to discuss real issues related to work, career, and family. Women in these peer networks benefitted from interacting with others and sharing experiences.[3]

Our Motivation:

While the E-Girls camp has a primary focus on increasing the interest and exposure for girls in our region to the possibilities and joys of STEM fields, a secondary goal is to support those who have already chosen to study and work in these fields. By supporting the community of women students and professional women in STEM, we help to build a foundation of stronger support for future outreach and for future success of those in the field. Because women benefit from a network of relationships[4,9] which is part of what E-Girls provides to its volunteer base, this paper aims to investigate "secondary" effects of E-Girls – how women who serve as mentors and contributors to the camp, may themselves find mentoring or community in the process.

Results:

We composed a 13 question survey, designed to probe the motivation for volunteering, and to explore what community may have been created as a result of participation in E-Girls. (See the appendix for a summary of the questions in our survey. Note that the actual survey contained branching to make it as efficient as possible for the respondents, so the table in the appendix is summarizes the types of questions that were asked.) In September 2015, we distributed the survey online to the 188 female E-Girls volunteers for whom we had current accurate email addresses. Note that we sent the survey only to the female volunteers because the hypothesis of the study was focused on women. The survey was kept open for one month with weekly email reminders to all non-respondents. A total of 71 women started the survey, with 67 completing it. The respondents represented all of the years of the program ranging from 6 volunteers from the inaugural year (2005), up to 22 from the 2015 program. Most of the respondents were students the first time they volunteered (37, 55%); the second highest category of respondents was from professionals employed in the region (13, 19%). The other respondents were split between university staff, student employees, and out of state professional women. The following section reports on these two groups. We will first look at the results from these two groups separately.

<u>Professional Volunteers:</u>
The most common reason that the professional women gave for volunteering was that they wanted to help promote technical careers to girls, followed by wanting to help impact the next generation. The main reasons for returning to volunteer after the first year were they enjoyed the experience and felt they were making a positive impact.

We also asked whether they kept up with the other volunteers and what other interactions they have with other professional women, and what else they are doing in outreach and at the university. Eight (62%) said that they meet up with the other volunteers on a regular basis. Ten (77%) responded with other professional networks where they get to interact with other professional women, ten also responded with ways that they work in STEM outreach (with an overlap of eight), while eight remain involved with the college of engineering at Boise State University. In all, 12 (92%) of the women responded positively to at least one of these questions about continued engagement with either the other volunteers, outreach, or the college of

engineering. In fact, the one person who didn't respond to these prompts commented that she had done these things in the past but now had retired and had thus stopped being active in this work. Four (31%) of the respondents engaged primarily as a direct function of their job.

When asked how they benefited by volunteering for this program, the overwhelming response had to do with the enjoyment in passing on the excitement about technical careers and interests and the joy of watching the girls learn these things. Here are some sample comments:

> *I personally enjoy interacting with female students as they enjoy the hands-on STEM lessons. By participating in e-Girls, I can learn what excites & inspires female students about STEM.*
>
> *It was fun to see what we are doing to get young girls interested in engineering.*
>
> *I really enjoyed helping girls see what an engineering career could be like.*
>
> *Enjoyed seeing the girls have fun while learning.*

Only one woman mentioned her own personal benefit of the networking aspect:

> *It helped me connect with other professionals in the community. Increased my awareness of educational opportunities.*

Therefore, for this population, we really can't confirm our hypothesis, that women found this an experience that helped to create community among like-minded STEM focused professionals and students. A confounding issue is the large percentage of the professional women volunteers who have other opportunities to network with other women through their jobs and other professional networks. Clearly, they value the opportunities to make those connections, but perhaps they do not overtly recognize the E-Girls volunteer work as one more of those opportunities. Perhaps these other opportunities created the community that then helped form the volunteer base for E-Girls.

For the Boise State University student volunteers, the most common reasons for volunteering the first time was the same desire to help to promote technical careers to girls, followed closely by the fact that they were invited to participate and that they thought it would be fun. The main reason (by a large margin) that they returned to volunteer a second (or further) time was that they really enjoyed it the first time.

29 (78%) of the student volunteers continue to interact with other student volunteers. Some of these are primarily interactions from taking classes together (7), but many mentioned that they have become good friends, studying together and getting together socially. The students have continued to interact with the faculty who volunteered at the program (not too surprising) but they have not had further connections with the professional women volunteers. Several stated that because of the format of the program, they did not really have much contact with these women. 24 (65%) of these students have continued to volunteer in other types of outreach activities related to the goals of the E-Girls program.

The student volunteers documented a variety of ways that the experience benefited them. In contrast with the professional women's responses, these comments indicated that the experience

had a personal impact on many of these student volunteers. Here are some representative comments:

> *On one level it has helped me meet other engineering major girls who also volunteered. On another level e-girls is all about how smart, capable, important girls are. It shows that even though engineering seems like a man dominated area, it isn't necessarily and girls should not shy away from it just because of social stereotypes or norms. It is a nice reminder every year that I can do all the things I want to do with my life.*
>
> *I was able to learn from some of the experiences the young girls have experienced in their lives and to be more excited and creative about my education, they reminded me of why I wanted to pursue a career in engineering.*
>
> *This volunteering opportunity sparked my interest in furthering my education. It also helped me be more confident in other volunteer opportunities.*
>
> *I learned better communication skills when explaining something technical to a young child.*
>
> *It reminds me why science is fun.*
>
> *I felt more confident with my interactions with other women in my field. I also had a lot more respect for other girls and women pursuing STEM careers.*
>
> *I enjoy learning about the different aspects of engineering that I don't necessarily get to see from my singular major of mechanical engineering. I enjoy participating in an activity with other STEM majors where we have the opportunity to discuss our different disciplines and interests. I love helping the girls that want to learn, and it's a fun challenge to get the more reticent girls to be excited about engineering.*
>
> *It made me realize that I was setting an example to other girls and that gives me motivation to push through some of my harder classes.*

There were also responses about the joy of giving back and inspiring the younger girls:

> *It felt amazing to be able to inspire young girls to get into a technical degree.*
>
> *I found it fulfilling to help young people learn about STEM fields. I like that I can invest in the generation after me, because I benefited from being invested in when I was young.*
>
> *By giving back you are personally fulfilled.*
>
> *It was so amazing to see the spark in the girls' eyes and to see their excitement.*
>
> *I love getting girls interested in STEM related careers, I feel we give them confidence by showing them it can be done!*

Two of the comments specifically mentioned the networking aspects of this opportunity:

> *I have made connections with fellow female engineering students in my college.*

Not only were the events fun to attend, it also helped me expand my professional network. Thank you for that!

Discussion

One decade ago, E-Girls was designed with an emphasis on developing community. Although E-Girls does not include a formal mentoring program, several attributes often associated with peer or alternate mentoring models are associated with our camp's design. In particular, friendship, role modeling, and acceptance were attributes that by design permeated E-Girls – these "psychosocial functions" [4] are one of the critical components of mentoring.

As a result of their participation, the survey of volunteers showed that although the professional volunteers did not report much of an impact in terms of an increased network, the student volunteers did appear to have been personally impacted; 65% of the student volunteers have continued to volunteer in other types of outreach activities related to the goals of the E-Girls program, part of this may have been due to an increased sense of community. A few student volunteers commented about their expanded network (fellow female engineering students, expanded professional network).

Summary

In summary, while both the professional women and the student volunteers for the E-Girls camp enjoyed the experience of inspiring the next generation, and found the experience fun and positive, we did not find explicit evidence that they were motivated to do this work in order to improve their own networks. However, both sets of volunteers are heavily involved in professional and/or volunteer activities related to women in engineering and hence find multiple opportunities to connect with other like-minded individuals. This aligns with the work of Kram, et al., who noted that women often benefit from a network of relationships, rather than the traditional model of mentoring.[4,9] Based on this fact and from the comments from the student volunteers about not having ample opportunities to really mingle with the non-academic volunteers, two immediate recommendations that come from this work are:

(a) Build in more opportunities for the student volunteers to network with the professional volunteers during the camp;
(b) Recruit volunteers from other than the "usual suspects" groups (that is, look for ways to include other professional women who might not have the opportunity through their work and professional networks to do similar outreach activities).

It is also clear that the student volunteers saw their involvement as a professional development opportunity in which they fully engaged. This can be built upon more intentionally with preparation and follow-on activities in the future.

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Foundation, Keynetics, the Wittenberger Foundation, First-to-File, and Soroptimist International of Boise.

Appendix: E-Girls Volunteer Survey Summary of Questions (reworded here for brevity)

Questions asked of all respondents:

- IRB Consent
- Which years did you volunteer? (choices of 2005 through 2015)
- Primary role when first volunteered
- If volunteered for more than one year, why did you return?
- What other outreach activities do you participate in?
- Please share how you may have benefited from participating as an E-Girls volunteer?
- Is there any advice you would like to give us about how to improve the experience of the E-Girls volunteers?

Questions asked by position when first volunteered:

Professional in area	University Student
Why volunteered the first time (asked for first and second most important reasons): • Was personally invited • Colleagues or friends told them about it • Wanted to serve local community • Wanted to give back to university (alum) • Company expects service to community • Wanted to promote technical careers to girls • Wanted to help impact next generation • Enjoy interacting with other technically focused women • Thought it would be fun • Other Do you interact with the other E-Girls volunteers in any other settings? If so, in a personal or professional setting? What other opportunities do you have to interact with technical professional women from the area? What other opportunities do you have to interact with the College of Engineering or University in general? Personally and professionally, do you have other opportunities to promote engineering and	Why volunteered the first time (asked for first and second most important reasons): • Was personally invited • Instructors or friends told them about it • Wanted to serve university • Wanted to promote technical careers to girls • The camaraderie with the other student volunteers • Interacting with the professional volunteers • Thought it would be fun • Other Do you interact with the other student volunteers in any non E-Girls setting? If so, describe. Do you interact with any of the non-student volunteers in any non E-Girls setting? If so, describe.

science/math to youth? If so, describe.	

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