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Cover Page Footnote

I would like to thank the following organizations and people for helping support our Women in STEM Professional Night: AAUW Oregon, AAUW Tillamook, AT&T, Oregon Community Foundation, OSU Open Campus, Symantec, Tillamook Bay Community College, Tillamook County Creamery Association, Tillamook Estuaries Partnership, Tillamook School District #9, Verizon, Walmart, and all the women who have volunteered for this event.

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Women in Science, Technology, Engineering, and Math Professional Night for Youths

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Abstract. Extracurricular science, technology, engineering, and math (STEM) activities are an engaging way to introduce historically-minoritized youths to STEM. In this article, I describe one such event, a Women in STEM Professional Night, designed to connect eighth-grade girls with women in STEM careers. This interactive event provides a personalized connection to STEM, helps combat gendered stereotypes, and builds girls' self-identification with STEM. Best practices include a carefully structured event, inviting a diverse group of women STEM professionals, and intentional preparation of all participants to set expectations. These insights serve as a guide for Extension professionals interested in creating a similar event.

INTRODUCTION

Women remain underrepresented in many science, technology, engineering, and math (STEM) fields, holding only 24% of STEM jobs (Noonan, 2017). Societal misconceptions and stereotypes are one factor contributing to this gender disparity in STEM. Certain STEM fields, particularly computer science and engineering, are generally perceived as dominated by men and associated with more masculine interests and characteristics (Cheryan et al., 2017). Further, entertainment media has historically portrayed women in STEM much less frequently and in more gender-stereotyped positions when compared to their male counterparts (Steinke, 2017). When girls and women see STEM fields as masculine, it can negatively affect their interest and sense of belonging in STEM (American Association of University Women [AAUW], 2015; Cheryan et al., 2017; Master et al., 2016; Steinke 2017).

In addition to these gendered messages and stereotypes, many students also get little firsthand experience with STEM. In-school STEM experiences are the primary source of exposure for many students, and when these experiences are less engaging and lack hands-on practice, students may intuit that STEM career options and job duties are limited (Wang & Billington, 2016). Extracurricular STEM activities offer a way to initiate youths' interest in STEM through more personalized and appealing experiences. In a survey of students with a high aptitude for and interest in STEM, over 65% said that an out-of-school experience was the beginning of their interest in STEM, while fewer than 20% said their STEM interest began in the classroom (VanMeter-Adams et al., 2014).

Out-of-school experiences that connect girls with women in STEM careers can be instrumental in countering gendered stereotypes and helping girls self-identify with STEM careers (e.g., Stout et al., 2011; Wang & Degol, 2017). Middle school is a critical time for these interventions. If students identify an interest in a STEM career by eighth grade, they are significantly more likely to complete a STEM degree in college (Maltese & Tai, 2011). Even short-term interventions can result in positive shifts in STEM career interest (e.g., Levine et al., 2015). Here we describe one such intervention, a Women in STEM Professional Night held during one evening of a week-long STEM camp for rising eighth-grade girls. In this carefully designed event, the participants: (1) learn about a variety of STEM careers, (2) meet women working in STEM, and (3) engage with adult professionals.

PROFESSIONAL NIGHT INSIGHTS AND BEST PRACTICES

The Women in STEM Professional Night has been a very successful event since Oregon's first Tech Trek STEM camp started in 2014. Tech Trek is a partnership between Oregon State University (OSU) Extension's Open Campus program and AAUW (see Henry & Munn, 2020 for details). Here, I describe the key elements of this event.

Event organization is critical to success. Several intentional design elements allow the event to run smoothly each year. We start the evening with dinner to let the professionals and youths meet in an informal setting. After dinner, we move into the main part of the program, which mimics a 'speed-dating' style event. The professionals are each stationed at their own table, or partnered with another professional when appropriate, and the youths are placed into small groups of three to four girls. These small groups ensure that every girl has time to ask questions of each professional while avoiding one-on-one conversations that might be uncomfortable for the youths. The small groups then rotate between the tables and have conversations with the professional(s) there for an allotted amount of time before switching when a volunteer timekeeper indicates the current round has ended. We typically have around 35 girls divided into groups that rotate through 10 to 12 tables of professionals. We designed the event to have an equal number of tables and small groups so no professional (or small group) is left without someone to talk to during each round. The girls spend around eight minutes at each table. The 'speed-dating' portion of the event typically lasts less than two hours.

The event should include a wide range of STEM careers, and all professionals should self-identify as women. Studies show that STEM stereotypes are weakened (Miller et al., 2015) and identification with STEM increases (Chen et al., 2019) in women and girls with greater exposure to same-gender STEM role models. We have included women working as Extension agents (agriculture and family and community health), fiber optic engineers, food scientists, marine biologists, packaging engineers, mycologists, large animal veterinarians, fish biologists, civil engineers, health care professionals, computer scientists, foresters, and hydrologists, among many others.

Prepare youths before the event. Before the event, we hold a one-hour workshop on professionalism for the girls. Taught by a local workforce development expert, the youths learn about professional behavior and draft questions to ask the STEM professionals at the event. As a result of this workshop, the youths come prepared with a list of relevant career and education-focused questions, allowing them to more comfortably interact with adult professionals while gaining relevant information.

Prepare professionals before the event. We provide the STEM professionals with details on the audience (eighth-grade girls), the format (dinner followed by 'speed-dating' conversations and then cake at the conclusion of the event), and the time commitment (approximately three hours) in advance. Because we ask professionals to volunteer their time at the end of a workday, we make our expectations clear. Of the professionals who participated in at least one event since 2014, 30% have returned for multiple years and over 88% indicated they are likely to volunteer for the event again.

SUMMARY

Youths can struggle to see the range of career options available to them, particularly in fields where they have been historically-minoritized (Wang & Billington, 2016). Intentionally-designed, out-of-school experiences can be a critical component of identity formation around STEM. After the camp, 98.9% of campers rated this event as good or excellent and, though only our first campers are now college-aged, 46.4% of those in college are majoring in STEM. Through designing and implementing our Women in STEM Professional Night, we have learned how to best conduct an event that maximizes youths' exposure to a variety of STEM careers in a comfortable, organized, and inclusive environment that can be adapted by Extension educators in any community.

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