

Implementing a Women of Welding Camp for Secondary Female Students

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Introduction

Welding is a highly demanded skill, as a welder deficit exists in the United States (Croy, 2016). Recent projections indicate the domestic welding workforce will reach a deficit of $\geq 375,000$ workers by 2026 (Guerra, 2018); this shortage is a combined result of more welding positions being created and older welders reaching retirement age. Access to a highly trained welding workforce has never been more critical to maintain our nation's infrastructure (Byrd & Anderson, 2012). According to the Bureau of Labor Statistics (2021), of the 550,000 employed in the welding workforce, 3.5% of these individuals are female. With the growing workforce demands, it is important to increase the number of female welders to help offset the impending deficit of qualified welders. Therefore, it is critical to develop effective engagement activities that promote careers in the welding industry to females. This innovative idea describes the creation and implementation of the Women of Welding (WOW) camp. The overall purpose of the WOW camp is to promote women into the welding industry through an intensive five-day summer camp. WOW camp participants must be female, apply to the program through electronic application, and must be a rising sophomore, junior, or senior in high school.

How it Works

Current female Texas State University students were selected to serve as WOW ambassadors to assist in the planning, developing, and recruitment for the WOW camp. An electronic application was created by the authors that interested WOW camp participants were required to complete. Recruitment and distribution of the applications was done at 14 major agricultural mechanics events within the state of Texas in the spring of 2022. At the agricultural mechanics events, flyers with a QR code link to the applications were given to those who were interested. The application was also distributed to all School-Based Agricultural Education (SBAE) teachers through National and State listservs and via social media. A social media page for the camp was created to connect directly with the girls interested in the program. Applications were due on April 1st. WOW ambassadors reviewed and notified the applicants of their status by May 1st. Participants who were selected received an email with the camp information. Those who were not selected but placed on a waitlist and those not selected outright received a phone call from the WOW ambassadors to help them improve their application in order to apply next year if eligible.

Development of the camp program included discussions with industry representatives and stakeholders to identify needed areas for the participants to receive career exposures. The selected participants who attend the WOW camp were engaged in several areas in the welding industry, including metal processing, oxy-acetylene cutting, manual plasma cutting, CNC plasma cutting, metallurgy, Gas Metal Arc Welding, Shielded Metal Arc Welding, Flux-Core Arc Welding, and underwater welding. Two female lead teachers with extensive welding industry and educational experience were selected to lead the WOW camp. Additionally, women in the welding industry volunteered their instructional services that aided in the camp's overall experience. These women also shared their experience as a female in a male-dominated industry and described their success in the welding industry.

The WOW camp started on a Sunday evening with dinner, a camp overview and keynote speaker. During the five days of the camp, the WOW participants were transported from the hotel via bus to campus by 8:00 am. Each morning would start with an hour of class instruction

that focused on the safety, operation, and career opportunities associated with the daily theme. Following the classroom instruction, the participants transitioned to the welding laboratory for three hours of skill development. During that time, the participants had an opportunity to use virtual reality welding training machines, computer-aided welding machines and traditional live welding training machines in combination to improve their welding knowledge and skill. Each day was broken down into different welding processes to advance the participants skills. During lunch there was a fifteen-minute career spotlight speaker comprised of women in the industry, post-secondary students pursuing welding related degrees, and researchers. After lunch, the participants returned to the welding laboratory for approximately three hours to use their newly acquired skills to complete application exercises where they built small projects such as welding tables and rocket stoves. They then departed back to their hotel and had dinner with a keynote speaker who was a woman in the welding industry. Each day operated similarly to this outline, although the activities varied based off what topic that was being covered that day. During the final day of the camp, the WOW participants split into four small groups that experienced underwater welding, CNC plasma cutting, visual inspections and weld evaluation and reflect on their time at the camp in focus groups. The camp ended mid-day with an award luncheon and career spotlight presenter.

Results to Date

The first WOW camp received 60 complete applications, of which, 28 girls from 14 states were accepted based on the number of hotel rooms available. In addition to the two lead teachers, four female welding educators volunteered to assist with the camp. Five female industry leaders volunteered their time as nightly keynote speakers. Eight more volunteers served as career spotlight speakers during the lunch break. Several companies donated personal protective equipment (PPE), t-shirts, stickers, and other materials promoting the welding industry. Three companies provided approximately \$20,000 in scholarship money.

Future Plans/ Advice to Others

As a USDA funded project, the camp will continue through the summer of 2023. Future plans include reaching out to major welding schools to feature an educational spotlight, sponsor lunch, and provide additional scholarship money for the participants. After 2023, industry support will be critical to provide this camp for free to young women interested in the welding industry. If this project were to be replicated, we recommend partnering with national, regional, and local companies in the welding industry to provide funding and in-kind donations to cover the cost of consumables, boarding, meals, PPE, and scholarships to the WOW participants. Additional funding should be secured for faculty salaries, plus WOW ambassador and lead teacher stipends.

Cost/ Resources Needed

This project is funded by a USDA/NIFA WAMS grant program for two years at \$99,999. Two-thirds of the expense is for the WOW camp, the remaining balance is used for faculty salaries, travel, and indirect costs. For the first year, hotel expenses were \$4,700, food costs were \$4,560, materials and supplies costs were \$6,335, lead instructors and evaluator costs were \$9,000, and WOW Ambassador stipends were \$6,000. In addition to the funds from the grant, a full welding laboratory set up included, virtual reality trainers, CNC plasma tables and welding machines would be necessary to complete the program as described above.

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