Delivering a Community-Based Agricultural Mechanics Service-Learning Experience

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Introduction

Service-learning as defined by Salam et al. (2019) is a form of experiential learning that allows students to have the opportunity to understand theories in constructive hands-on environments. Vogelgesang & Astin (2000) stated service-learning has an intense form of pedagogical impact on students because they can connect their academics with concrete experiences. Salam et al. (2019) also stated, service learning has become more popular in higher education as a strategy for teaching and learning. Morton, et al. (2023), studied how connecting students to their communities saw an improvement in student problem solving, communication and collaboration skills. The Agriculture Mechanics Association (AMA)'s mission is to connect students to the field of Agricultural Mechanics through professional, service, and social opportunities at Texas State University. One way this student organization connects its students to the community is through implementing service learning in the form of community-based welding workshops. By creating these welding workshops, the organization's members can relay their knowledge from classes into creating an opportunity for community members to learn a new trade skill. The purpose of these workshops is to encourage community members to participant and learn about the welding industry and to develop their skills in the one-day workshop.

How it Works

The Agricultural Mechanics Association (AMA) student organization members collaborate to plan and implement the workshops in advance. Members sign up to volunteer for the event and take on special duties to ensure the event runs smoothly. One member created promotional materials for the event and shared the information on social media platforms. In addition, paper fliers were created and hung around the campus to encourage faculty and students from other academic disciplines to participate. Club officers and club advisors collaborated and contacted industry representatives to secure sponsorships to cover food and material costs. The one-day workshops are open to the public and capped at thirty participants. To reserve a spot and to prevent no-shows, a deposit is required to confirm a seat. The AMA has hosted four welding workshops since the Fall of 2021. AMA hosts a Shielded Metal Arc Welding workshop in the fall and hosts a Gas Metal Arc Welding workshop in the spring.

At the beginning of the workshop, participants arrive prior to 8:00 am to check-in and get ready to start. Breakfast food and beverages were provided during that time. At 8:00 am, the participants start in the classroom with an educational lesson over the basics of the specific welding process taught by one of the AMA's more advanced student members. The participants will learn about safety and the importance of following all safety protocols in the shop with the teacher. After this lesson the participants take a point-based, four question quiz that evaluates their welding experience. Participants are then arranged in order from lowest score to highest score to be divided into groups. By putting them in groups like this, it allows participants who are not less experienced and participants who are more experienced to work together. These groups are then given their first station in the rotation. The stations included virtual reality (VR) welding, live welding, and plasma cutting for the GMAW workshop and VR, live welding, and Realweld for the SMAW workshop. The VR welding machine utilizes a full immersive VR environment with visual and audio cues through a headset the participant wears. Participants get comfortable performing practice welds and the sounds and views that occur in a welding booth. Live welding occurs in the university's welding booths where participants practice laying beads or weld joints. Plasma cutting teaches participants how to manually cut pieces of metal. Finally,

the Realweld machine is a computer-based audio feedback training machine where participants practice laying beads or weld joints with audio feedback in either live or practice settings.

After the classroom lessons, the participants spend 15 minutes getting fitted with PPE that they keep including welding helmets and gloves. After this is complete, they go to their assigned stations and spend one hour at each station. The morning rotations focus on welding on flat plate. The live welding station takes place at the welding booths. Participants go to the booths to practice their welds after a demonstration by the student instructor. Plasma cutting is taught similarly to the live welding station. Participants use scrap metal to practice plasma cutting. The VR station has a student volunteer that demonstrates how to use the VR welder. Participants then take turns practicing with the option to use the headset or not. The Realweld station has a student volunteer demonstrate before the participants get to practice. The Realweld gives participants verbal cues to help correct their form. This station also allows them to practice with either live welding or in the Arc off mode. At around lunchtime, the participants are done going through each station. A 30-minute lunch break, with lunch provided, allowed participants time to ask questions or socialize. After lunch, participants returned to their stations, spending an hour at each station practicing a joint weld.

Results to Date

The workshops are capped at 30 participants for each. In total, the four workshops have had over 85 participants. The participants were primarily from the local community or surrounding areas, but participants from longer distances have steadily increased with each workshop. The welding skills varied from beginner to expert levels and ages ranged from 6-65+. Informal feedback at the workshop and comments made on social media indicate that the participants enjoyed the experience and highly recommend it to others. Participants mentioned that through this workshop they felt more engaged with the university and that it improved their view on the college students in their community.

Future Plans / Advice to Others

The workshops provide a unique opportunity for students to plan and implement successful community-based service-learning experiences. The workshops are beneficial for community members seeking to hone their skills, improve community relations, and generate a profit for the organization. The organization plans to continue to host workshops in the future. Additionally, AMA officers are looking into other workshops such as different welding processes, electrical wiring, small engines, and woodworking. We recommend after the workshop, sending an evaluation to participants and the student volunteers to reflect on the experience. The organization is also looking into contacting more industry companies to sponsor different areas of the workshops. Finally, we recommend setting dates and getting advertisements in local businesses and social media platforms out at least two months in advance.

Costs

The registration cost for the participants is set at $200 which includes two meals, PPE, consumables, and the training. The cost to host the workshop includes the welding helmets, gloves, metal, welding rods/wire, food, and time. However, the students are typically able to get sponsorships and/or donations to cover all input costs. All proceeds then go to the student organization where they reinvest the proceeds into other community engagement events.

References

Bringle, R. G., & Hatcher, J. A. (1996). Implementing service learning in higher education. *The Journal of Higher Education*, *67*(2), 221. https://doi.org/10.2307/2943981

Morton, M., Thomson, L., & Varghese, J. (2023). The value of community engaged teaching and learning is in the values: Advancing Students' Learning Outcomes. *International Journal of Research on Service-Learning and Community Engagement*, *10*(1). https://doi.org/10.37333/001c.66273

Salam, M., Awang Iskandar, D. N., Ibrahim, D. H., & Farooq, M. S. (2019). Service learning in Higher Education: A systematic literature review. *Asia Pacific Education Review*, *20*(4), 573–593. https://doi.org/10.1007/s12564-019-09580-6

Vogelgesang, L. J., & Astin, A. W. (2000). Comparing the Effects of Community Service and Service Learning. *Michigan Journal of Community Service Learning*, *7*, 25–32.