Self-Driven Service Learning: Community-Student-Faculty Collaboratives Outside of the Classroom†

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INTRODUCTION

Service learning is a community engagement pedagogy often used in the context of the undergraduate classroom to synergize course-learning objectives with community needs. Service learning can be a means for undergraduate students to explore talents and potential career paths, while bringing together local communities and cultivating shared interests (1, 4, 5). We have found that an effective way to catalyze student engagement in service learning is for the students’ participation to occur not in the context of a graded course, but outside the classroom, driven by their own interests and initiative. Students and faculty in the biological sciences at Rollins College have partnered with the local science museum, the Orlando Science Center, to allow a diverse group of undergraduate students to gain experience as curriculum designers and educators. This service learning experience allowed students to explore careers in the sciences and identify skill strengths and weaknesses in an environment where mentoring is available but where student initiative and self-motivation are the driving forces behind the project’s success. Self-driven service learning introduces young scientists to the idea that their careers serve a larger community that benefits not only from their discoveries but also from effective communication about how these discoveries are relevant to everyday life (3, 4). In this paper, we describe the creation and implementation of this program and discuss its benefits from the point of view of the community, students, and faculty.

PROCEDURE

Our goal was to provide the scaffolding for self-driven service learning for undergraduate students in the biological sciences at Rollins College. Faculty communicated with staff at the Orlando Science Center (OSC) to discuss ways in which Rollins students could volunteer and help educate the local community about basic concepts in the biological sciences. The best format was identified as a special event to be held at the museum’s public laboratory, a space open on weekends to the general public. Dr. Dare’s Laboratory, named after a fictional scientist, features seven lab stations, each with a computer and bench work area. This space was ideal for presenting open experiments, where museum guests could try a different experiment at each station, entering and leaving the lab as they like. The special event was named ‘Cell Day,’ to provide an opportunity for students with a broad range of interests related to cells and DNA to take over Dr. Dare’s Laboratory and teach the community. Interested students were recruited to design experiments and activities for each of the seven stations. The audience would include museum guests, primarily young families with elementary school-aged children. Cell Day took place in March 2015, approximately six months after the initiation of the project in October 2014.

Approximately 20 interested students were recruited by issuing a ‘Call for Volunteers’ with the help of the Center for
Leadership and Community Engagement at Rollins College (Appendix 1). All of them were science majors interested in careers spanning medicine, scientific research, dentistry, and veterinary science. The group met every other week to brainstorm about the important topics in cell biology to highlight during Cell Day and activities/experiments for each station (Appendix 2). Students researched ideas and potential projects/experiments on their own time and ultimately selected a station of interest to develop. During subsequent meetings, students provided feedback to each other on their ideas. Once students started developing material for their stations, they visited Dr. Dare’s Laboratory to observe the results and generate ideas to refine their activities. To introduce guests to the topic at hand and walk them through the procedure, students designed presentations to accompany their activities and experiments. Museum staff reviewed these ideas and presentation files and provided feedback (Appendix 3), which helped students tailor them for the public audience.

To tie all of the stations together and give topical continuity to the event, a Rollins student was recruited to design a lab notebook and activity/coloring book that guests could complete during their experience and take home with them as they left the lab (Appendix 4). This ‘Cell Passport’ served to enhance the engagement of the guests (primarily elementary school-aged children). Guests could have their passports stamped at each station, motivating them to visit all the stations. Students designing the curriculum helped create and revise the content of the Cell Passport (event logo shown in Fig. 1).

Approximately 200 guests attended the event. It was evident that they enjoyed the activities and that the undergraduate students were successful in the strategies they used to reach their audience, adapting their facilitation methods to match the ages and comprehension of guests. In some instances, volunteer students modified their activities and presentations over the course of the event based on participant observations.

Students majoring in Education provided expertise in assessing what guests learned. They constructed a KWL (What I Know, What I Want to Know, What I Learned) chart using information provided by guests during short interviews before and after participation in the Cell Day activities (Appendix 5). Volunteer students also responded to a series of reflection questions (Appendix 6). Following the event, feedback was obtained from these education students as well as from volunteers and museum staff (Appendix 7).

CONCLUSION

Taking service learning outside of the classroom provided undergraduate students with an opportunity to gauge their interest and aptitude in areas like science communication, curriculum design, and education in a stress-free setting. This context fostered collaboration between students from different disciplines, including non-science majors. A similar activity could be adapted for use in the classroom, perhaps by having students design a science museum station activity in lieu of a research paper.

The intensity of the undergraduate biological sciences curriculum often imposes time constraints that preclude educators from integrating service learning and training in science communication into their courses. Effective science communication is an important skill for students who are interested in science careers like medicine and scientific research—their success will depend in part on how well they convey their science to patients, colleagues, funding agencies, and government representatives. This training is important not only for undergraduates to learn to effectively communicate relevant scientific concepts, but also to truly master the content and to form an identity as scientists (2, 6). The type of community outreach activity we describe could create these critical learning opportunities by allowing important developmental stages in scientific training to take place outside of a course.

SUPPLEMENTAL MATERIALS

Appendix 1: Call for volunteers
Appendix 2: Supplemental Table 1: List and descriptions of stations at Cell Day
Appendix 3: Supplemental Table 2: Museum staff feedback on station activities
Appendix 4: Supplemental Figure 1: Pages in the Cell Passport booklet
Appendix 5: Supplemental Table 3: Representative museum guest responses to KWL questions
Appendix 6: Supplemental Table 4: Student responses to reflection questions
Appendix 7: Supplemental Table 5: Constructive feedback to improve event in the future

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REFERENCES