

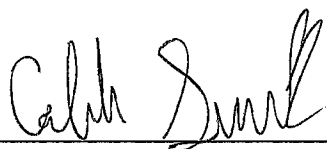
Curriculum Enhancement for Biology at Purnell Swett High School: A Service-Learning Project

Senior Project

In partial fulfillment of the requirements for
The Esther G. Maynor Honors College
University of North Carolina at Pembroke

By

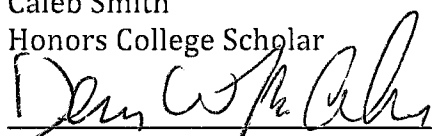
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March 30, 2017



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4/19/17

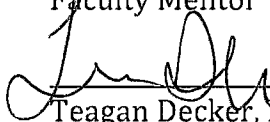
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Acknowledgements

I would like to express my sincere gratitude towards Dr. Dennis McCracken, Dr. Velinda Worix, Dr. Sivanadane Mandjiny, and Amanda Bowman for taking time to help coordinate and participate in my service-learning project throughout the semester.

I would also like to thank Mrs. A. Michelle Hardin, and the Purnell Swett High School staff and administration for allowing me to conduct my service-learning project at their school.

This project is dedicated to Dr. Scott Hicks, Dr. Teagan Decker, and Dr. David Marquard for teaching me the value of service-learning and inspiring my involvement of service-learning within the community.

Abstract

For my project, I present my biology service-learning experience at Purnell Swett, a local high school in Pembroke's community. The major task of this project is providing an educational and positive learning experience of biology and science for tenth-grade students, who are preparing to take the state-mandated End of Course Test (EOCT) for biology. I demonstrate the impact of tutoring and review sessions each week for tenth-grade students currently in biology classes, particularly for students struggling to understand main concepts, while incorporating hands-on experiments and activities within the community to further their biological understanding. The overall goal of my project is to encourage local high school students to continue pursuing a higher education, as well as helping them feel prepared for the biology End of Course Test. My project will also provide an example of how service-learning can be incorporated into any subject, and the positive effect of service-learning within a community.

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According to Bandy (2011): “Service learning is a teaching and learning strategy that integrates meaningful community service with instruction and reflection to enrich the learning experience, teach civic responsibility, and strengthen communities.” For me, service-learning is a contribution to my community in order to create a positive impact on the community itself and the people within it, while also bettering myself. As a Biology major with a Biomedical Emphasis concentration, I have had a large amount of support from both teachers and peers throughout my high school and college career who have continuously encouraged me to continue my education and pursue my future career in the medical field. Felzien & Salem (2008) state: “Connecting service to an academic field of study contributes to cognitive development and learning in the affective domain.” This information helped me to develop my idea for incorporating biology into service-learning. My project focused on implementing the same encouragement and support for local high school students currently enrolled in biology classes.

For my service-learning project, I volunteered during Fall 2016 and Spring 2017 semesters at Purnell Swett, a local high school in Pembroke’s community. I led tutoring and review sessions twice each week for tenth-grade students taking biology classes, and particularly focused on students struggling to understand main concepts. The major task of this project was providing an educational and positive learning experience of biology and science for these tenth-grade students at Purnell Swett by incorporating hands-on experiments and activities within the community

to further their biological understanding. The overall goal at the end of the project was to emphasize the importance of continuing a higher education to the students, as well as helping them feel prepared for the state-mandated End of Course test for biology.

In order to create and structure my plan for biology service-learning, I compiled literature, such as online journal articles, websites, and research papers, which focused on incorporating biology into service-learning. These sources provided information on how to structure ideal service-learning plans to promote the educational aspect of biology, as well as finding ways to get students involved in science-related activities within communities. For instance, in the online journal article “Connecting Biology, Service-Learning, and Youth Awareness,” Dr. Ratna Gupta reviewed difficult biology material to students within a small, rural high school biology class and implemented hands-on activities to help them gain a better understanding.

The first step for implementing my biology service-learning project was contacting Purnell Swett High School to receive approval for my project. Mrs. Kathy Chavis, the coordinator for volunteering and service-learning within Pembroke’s public schools, approved my project for the 2016-2017 school year. After I completed the required paperwork to volunteer within Robeson County Public Schools, Mrs. Chavis coordinated a meeting between the biology teachers at Purnell Swett (Olivia Bird, Gertie Mariani, and Michelle Hardin) and I to discuss the lesson plans used to teach biology in the classrooms. The teachers provided me with a copy of their course guide, along with other materials such as biology study guides and

worksheets. These materials helped me to create an outline and plan activities to for working with the tenth-grade students. The teachers specifically asked me to focus on students who struggled with certain concepts and learned at a slower pace than others in the classroom. We also planned my schedule to work with the biology students twice a week during their elective classes. Purnell Swett provided all of the supplies needed in the classrooms, such as dry-erase markers for the whiteboards, and iPads for each student to learn through programs, applications, and technology.

The next step of my biology service-learning project was presenting the project outline to Dr. Dennis McCracken, my senior project mentor and professor for UNCP's biology department. We reviewed my project and discussed how tutoring and implementing educational activities involving biology would motivate the tenth-grade students. I also took into account Sherman & MacDonald's (2009) work, which described the importance of implementing service-learning into a classroom setting: "...well designed service-learning is worthwhile, useful, and enjoyable and that it is a powerful learning experience for those involved." As a former high school biology teacher, Dr. McCracken offered advice and ideas to enhance the students' learning experience in a positive manner. For example, he explained that in order for the students to actually learn, the material being taught must be simplified on a level where everyone in the classroom is able to repeat and explain it in their own way.

An important part of my biology service-learning project was hosting a field trip for the tenth-grade biology students to visit UNCP's campus. Honors student Amanda Bowman and I coordinated the field trip with Dr. Dennis McCracken, Dr.

Sivanadane Mandjiny, professor and chair for UNCP's Chemistry and Physics Department, Dr. Velinda Worix, professor and chair for UNCP's Biology Department, and Mrs. Michelle Hardin, biology teacher at Purnell Swett High School. The high school students arrived on campus on April 12, 2017, and first worked with Dr. Mandjiny, Amanda, and I to demonstrate a simple acid-base experiment for understanding the basis of the pH scale. The students then worked with Dr. Worix, Amanda, and I to create their own microscope slides by using pond water samples containing microscopic organisms. We taught students how to operate compound microscopes in order to view cells and gain a better understanding of what bacteria and cells look like, as well as their function. This opportunity excited the students about biology and science, and helped them visualize the material learned in biology class throughout the semester. By inviting local high school students to UNCP's campus, this provided a way to connect UNCP's campus with Pembroke's community, and stimulated the community's involvement with education

My Maynor Honors College senior project implemented two topics I developed a passion for throughout my college career at UNCP: service-learning and biology. As interesting and important biology is to me, I realized not everyone experiences the same passion for it that I have. However, biology is a required class to take in public high schools in North Carolina. Tenth-grade students must successfully pass a standardized End of Course examination based on this subject in order to graduate high school. Through my experience of service-learning in the community of Pembroke, I wanted to apply the knowledge of biology with an educational and enjoyable form of learning for students enrolled in biology classes

at Purnell Swett High School. My project was designed to help these particular students understand the material they have learned within their biology classes, encourage them to pursue a higher education after graduating high school, and promote them to apply their scientific knowledge into the community in a positive manner.

References

Bandy, J. (2011). What is Service Learning or Community Engagement?. Retrieved from <https://cft.vanderbilt.edu/guides-sub-pages/teaching-through-community-engagement/>

Felzien, L., Salem, L. (2008). Development and Assessment of Service Learning Projects in General Biology. *Bioscene*, 34(1), 1-12.

Sherman, A., MacDonald, L. (2009). Service Learning Experiences in University Science Degree Courses. *Innovative Higher Education*, 34: 235-244.