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Title of Project: Improving Science Education in Impoverished Communities

Degree (Circle one): Undergraduate Masters Doctorate

Date of Graduation (Month Year): 5/19 Degree Received B.S Biology

Major Subject: Biology

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Improving Science Education in Impoverished Communities: 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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3 May 2019

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4/30/19

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Acknowledgements

I would like to thank Dr. Sivanadane Mandjiny for his support and assistance while being my mentor throughout my senior year as I planned and conducted my senior project.

I would also like to thank Ms. Jessica Oxendine, Dublin Primary School administration and staff for providing me with the opportunity to work with their students to complete my service learning project.

Lastly, I would like to thank Dr. Teagan Decker, Dr. Mark Milewicz, and the Esther G. Maynor Honors college for their continuous support throughout my college career and for providing me with the opportunity to complete a service learning project.

Abstract

The objective of this service learning project was to introduce three different classes of first grade students in an impoverished community to a new science concept in a fun, interactive way. Science is not heavily taught to elementary aged children attending school in impoverished communities due to lack of resources. The concept that was taught to the students was density through, first, explaining what density is, then demonstrating the concept of density through an oil and water experiment, and finally allowing the students to do the experiment on their own. At the end of the science lesson, the children were asked questions to see how well they grasped the subject. The lesson proved to be a successful, positive experience because the children were engaged while the lesson was being conducted and understood the concept that I was teaching. The service learning project that I conducted exposed elementary aged students to science curriculum so that they can begin problem solving and learning about the world around them at a young age and so that science will not seem so "scary" to them as they grow older.

Improving Science Education in Impoverished Communities: A Service Learning Project

While contemplating what I wanted my senior project to be focused on, I knew that I wanted it to be centered around science because that is what I am getting my degree in and what my future career will be in. I also knew that I wanted to conduct a service learning project because I am passionate about giving back to the community and helping others succeed in any way that I can. With the goal of working in pediatrics as a Physician Assistant, I knew that I wanted my project to involve working with children.

Growing up in the impoverished community of Robeson County, I know from personal experience that science is not heavily taught in schools especially in lower grades at the elementary level due to not having the resources and time restraints. It was taught so infrequently at my elementary school that I have no recollection of doing anything science related in grades kindergarten through fourth grade. As a science major, I believe that it is so important for children to be exposed to science curriculum so that they can begin problem solving and learning about the world around them at a young age. This is also important so that science will not seem so “scary” to them as they grow older. Also, according to the Journal of STEM Education, minority and low-income students are severely underrepresented in STEM careers. This can be attributed to these students not being exposed to science education at an early age so that they are not intimidated by the subject as they get older (Dika, S., Pando, M., & Tempest, B.). Therefore, I wanted to aid in exposing children in impoverished communities to science.

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When completing the project, there were several tasks that had to be done. The first step in completing the project was contacting the school where I wanted the service learning project to be conducted. I chose Dublin Primary School because I had volunteered there previously and had contacts with the administration there. I worked with the school counselor, Jessica Oxendine, to set up the dates, times, and grade level that I wanted to work with. We both decided that I should come during the month of April since it is considered career month at their school, where individuals with different careers come and educate the students about their career. We decided that I could both teach the students about a science topic, as well as, educate them about the career of being a scientist. I conducted my project with three different first grade classes that each consisted of around fifteen students on two different days for about an hour.

After contacting the school and setting up the logistics of the project, I had to create the science lesson that I was going to do with the first graders. I had four objectives that I wanted to meet when completing the service learning project. The first objective was to expose the students to a new science concept. The second objective was to introduce the students to new science terminology. The third objective was to conduct a fun, interactive experiment with the students that correlates to the topic presented. The last objective was to explain to the students what a career as a scientist would look like.

The science topic that I chose to introduce the students to was density. The experiment that I did to correlate with the topic is showing how oil and water do not

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mix by making calming jars with the students. I chose to start my lesson with explaining what a scientist is, how they work in a lab, and some of the safety precautions that they must take when working. I took my lab coat and safety goggles to show the students the attire that I have to wear when working in a lab. Next, I introduced the students to some new science terminology as I explained to them the concept of density. I taught them that density is similar to objects floating or sinking when swimming in a pool. I explained that heavier substances are more dense because they weigh more and will sink to the bottom, while lighter substances are less dense because they weigh less and will float on top.

After explaining to the students the science behind the experiment that we would be conducting, I first demonstrated the experiment before they each got to do their own. The materials needed for the experiment were colored water, baby oil, a Petri dish (for my demonstration), pipettes, travel-sized bottles (for the students), and glitter. For my demonstration of the water and oil experiment, I filled a Petri dish with baby oil and then placed multiple droplets of colored water in the dish. The students were able to observe how the water droplets sank to the bottom, meaning that water is more dense than oil. I then took a fork and tried to stir the water and oil to attempt to get them to mix together and the students were able to see ,that no matter how hard I stirred, the two substances would not mix (“Oil and Water Experiment for Kids”).

After my demonstration, each student was able to do the experiment themselves in their own bottle. The bottle was filled with baby oil and they were able to add their own droplets of colored water. I told the students to shake the bottle as hard

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as they could to see if the water and oil would mix together. They were able to observe that the two substances did not mix. At the end, glitter was added to each student's bottle to make it into a calming jar that they could take home with them. A calming jar is designed to soothe and relax as you watch the glitter in the bottle slowly sink to the bottom. The school counselor, Jessica Oxendine, explained to the students the purpose behind the calming jar and when they were supposed to use it.

At the end of the experiment, I opened the floor for the students to ask any questions that they had. Then, I went around the room and asked each student what was one thing that they learned today and also asked several other questions. I did this to see how well the students understood the concept and if they could recall the terminology that I introduced them to at the beginning of the lesson.

Overall, I feel that my science lesson was very successful each time that I conducted it with the students. The students were always excited, engaged, and could answer the questions at the end. Although some students did grasp the concept better than others, each student gained a great experience from the lesson and were introduced to a new concept in science.

References

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Photos Courtesy of Dublin Primary School