

Promoting STEM Education and Awareness Among Elementary School Students Through Neuroscience: A Review of the Efficacy of STEM Related Activities at the Rkids Afterschool Program



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Abstract

The Neuroscience 215: Applications in Neuroscience course is structured around community outreach efforts with elementary school students. Working in cooperation with the RKids afterschool program in Geneseo, this course works to encourage interest in STEM among “at-risk” youth. As part of this outreach program, children of various ages and academic standings participate in interactive activities geared towards STEM education and awareness. The objective of this course is to provide these children with early exposure to the sciences, and to reinforce future activity in STEM-related areas. A secondary objective is to assess the impact of this early exposure on the children’s future interests.

Procedures and Methods

Workshops were conducted 6 times across the Spring 2018 semester with interest on how the location of each meeting affected the success. Additional interest was placed on how separating kids into groups affected success of the meeting. Each workshop pertained to a different aspect of neuroscience.

- February 8th (St. Michael’s Church) - Introductions, assessment of interest. (No groups, n=7)
- February 15th (Bailey Hall) - Tour of neuroscience laboratory and ISC. (No groups, n=5)
- March 8th (Bailey Hall) - Microscope lab, discussion of interspecific differences in brain structure. (2 Groups, n=10)
- March 29th (St. Michael’s Church) - Discussion of alcohol and orientation w/ beer goggles. (2 Groups, n=9)

Results

- Potentially increased interest in STEM fields, implicated by active participation.
- Significant differences in behavior were not found as a result of differing locations.
- The class size grew from 5 to 10 children after the second session. The larger class size was associated with more appropriate behavior. This could be a result of breaking up into groups.

The children responded positively to being asked questions, engaging in hands-on activities, and individual attention. Structure and planning was essential. Time between activities immediately resulted in unruly/inappropriate behaviors.

Introduction

Recently, there has been an emphasis placed on the promotion of Science, Technology, Engineering and Math (STEM). These disciplines have traditionally been considered important pursuits, but are now truly gaining central importance in schools and various educational curricula. However, despite this renewed importance placed on STEM disciplines, there are still many places where opportunities in these disciplines are limited in their access for students. These limitations make it difficult not only to promote interest in these areas, but also significantly hinders the growth of these disciplines without which there cannot be increased access. This cycle can be diverted by the establishment of outreach programs. Such programs have been found to create enduring changes in the lives of the participating students by providing a source of supplementary education in a less formal, more individualized setting. Such aspects of these programs lend to their effectiveness in educating students and establishing enduring interest in STEM disciplines. The Geneseo Neuroscience department aims to promote these ideals and through a collaboration with an AmeriCorps Vista representative, we endeavored to educate and engage local children in STEM related topics. To accomplish this, Neuroscience majors worked to create workshops promoting interest in STEM fields in an applied manner. These workshops were established for children in the Rkids program sponsored by Vista AmeriCorps in cooperation with St. Michael’s Episcopal church. These were generally children from low-income families and in some cases, suffered from developmental and intellectual disabilities. The goal of this program was to engage these students in exciting ways to create a general awareness of the possibilities within the STEM field, specifically through the lens of Neuroscience. As this program has been established and running successfully for the past year, one of the unique challenges faced this semester was establishing new and distinct activities for the children that were not previously explored. The Neuroscience majors also worked to understand the most effective means of reaching young students and increasing enthusiasm about the STEM disciplines in fun and relevant ways.



Discussion

Working in cooperation with the RKids program has provided a STEM-focused learning experience for the participating children. Similarly, those involved in teaching the children have learned to better reach the children’s interests through interactive workshops. During the scheduled meetings with the children, initial behavior tended to be inappropriate, but improved considerably when the children were given structured activities. Many of the children demonstrated interest in the scientific subject matter of each activity, with some asking insightful questions beyond what was expected of this age group. The children responded positively to the games and/or workshops planned, particularly those involving hands-on demonstrations. Future objectives of this program are to establish a baseline measurement of the children’s interest in STEM material, periodically measuring interest throughout the program’s duration.