

Girls Excelling in Math and Science (GEMS)

Kristin Seiloff, Mentor: Dr. Carol Colatrella

Georgia Institute of Technology | Inman Middle School

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GEMS working with PICO Robots



Building PICO Robots



Programming using computer interface



Making paper after learning about the engineering that goes into the process



Receiving assistance and instruction from a paper engineer

Introduction

The objective of the Inman Middle School GEMS (Girls Excelling in Math and Science) is to increase the interest of science, technology, engineering, and math skills in young girls. The GEMS Club is a registered Girl Scout Troop, keeping with the ideals of traditional scouting, but it remains focused on a more-specific content area. The club sponsored by the Center for the study of Women, Science, and Technology (WST) and the Girl Scouts. The GEMS enjoy a noncompetitive environment where they can learn about a variety of disciplines, participate in team building and leadership activities, and build courage, confidence, and character. Additional opportunities encourage girls to explore and work with different technologies such as robotics and digital video. In addition, many of the activities include hands-on experiments, service opportunities, and career research. Each week, approximately 35 Inman Middle School girls gather to complete activities related to forensic science, mechanical engineering, aerospace, video editing, and paper engineering, just to name a few. This is the GEMS third year at Inman, and I am now researching ways to implement similar programs at other middle schools and at the high school level. With this research, I hope to gain valuable information to help us learn ways to spread the vision and mission of the GEMS club.

Activities

The students attend weekly meetings after school, which typically last 1.5 hours. These meetings, along with some supplemental field trips, are intended to increase interest, exposure, and experience with Science, Technology, Engineering, and Mathematics (STEM) content areas. Some of the activities that the GEMS have done include:

- Robotics
- Forensic Sciences
- Chemical Engineering with Cosmetology
- Paper Making
- Dissections
- Industrial Engineering Que Theory
- Anatomy and Exercise Science
- Leadership Skills and Character Traits



Creating lip gloss after learning about the chemicals and ingredients that go into different cosmetics



Engaging guest speakers in related fields

Research Method

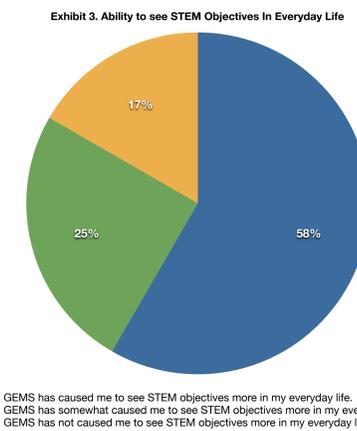
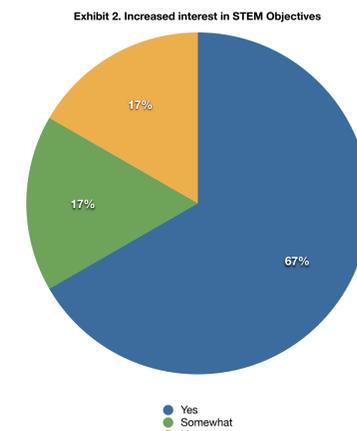
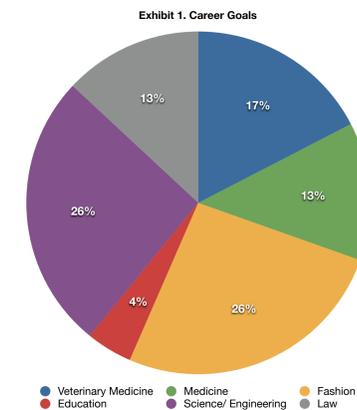
Much of this study involves interactions with the GEMS, planning and implementing their activities. In this study, more quantitative research has been conducted through anonymous surveys to gauge the students' feeling and reactions to GEMS.

Results

Our study has shown that over half of the girls who participate in the GEMS Club want to some day work in a STEM-related field (Exhibit 1). When asked about this, several students reported that GEMS has influenced their career dreams and goals. In addition, a large majority of the students feel that their interest in STEM objectives has increased since starting to attend GEMS meetings (Exhibit 2). The girls often say that one of their favorite parts of GEMS is being able to explore a variety of science fields without the pressure of having boys with them. Many also say that they feel like GEMS has helped them understand science topics at school. Finally, the surveys submitted by the students show that they can now better recognize STEM objectives in routine, daily occurrences in their lives (Exhibit 3). This research proves that the GEMS Club is fulfilling its purpose to gives middle school girls exposure and experience with activities in the STEM fields.

Conclusion

After conducting research, having conversations with current GEMS members, and speaking with educators at other middle and high schools, it is very clear that GEMS Clubs would be effective and needed at other schools. Going into the future, the Inman GEMS Club can serve as a model for other start-up GEMS Club in Atlanta and beyond.



Working as team to test the strength of paper towels



Explaining the different major veins in the human body to other students using chalk



Dissecting a pig heart