Undergraduate Leaders for STEM Mobile Making at Middle Schools

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STEM Ambassadors

Key Roles: facilitate the activity based on trainings and delegate tasks among the team members

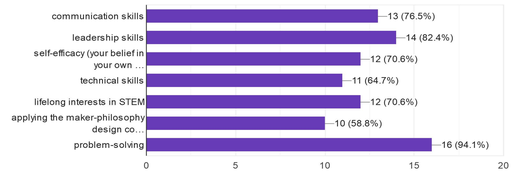


Fig. 1 Skills that STEM Ambassadors improved on since joining CRESE

Community Service Learners

Key Roles: apply concepts learned in activity trainings to provide hands-on assistance

- Increase leadership skills
- Successfully communicate STEM Mobile Making
- Apply strategies to help middle school students succeed with maker projects
- "Relate" to middle school students
- Feel comfortable working with middle school students
- Increase interest in participating in STEM-related outreach

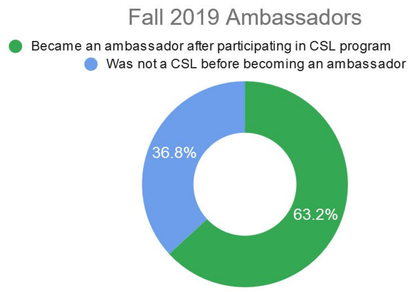


Fig. 2 63.2 % (7) of our 19 current Ambassadors were previously a CSL

Education students

Key Roles: apply content learned in Education courses to assist with classroom management

- Learned to be prepared prior to sessions
- STEM Ambassadors emphasized that Education students offer support and encouragement to middle school students, as well as assisting middle schoolers with brainstorming.

Introduction

CSUSM undergraduate students visit local middle schools to lead our after-school Mobile Making program that involves hands-on STEM activities. Mobile Making is a learning experience for the middle-school students, but at the same time, the undergraduate leaders develop technical skills, leadership skills, and lifelong interests. The activities are facilitated by STEM Ambassadors, Community Service Learners (CSLs) from STEM courses, and Education students from the iTeachSTEM program.

Our teams are committed to teaching middle school students how to apply STEM-related topics to their daily lives, especially students who are underrepresented in the STEM community. Examples of the activities consist of circuit boards, hydraulic boxes, and automata. Undergraduate students apply maker-philosophy design concepts such as investigate, plan, create, and evaluate in order to push forward cognitive skills that will prepare them for future success. Our teams of leaders develop self-efficacy through participating in the STEM Mobile Making. This poster will discuss the impact that the Mobile Making program has had on our undergraduate leaders.

Goals

Undergraduate students become near-peer role models to middle school students and increase their interest in STEM.

Through the program, STEM Ambassadors are able to enhance their STEM knowledge and soft skills.

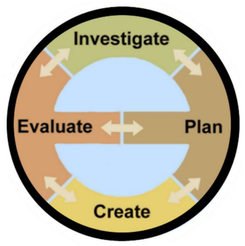
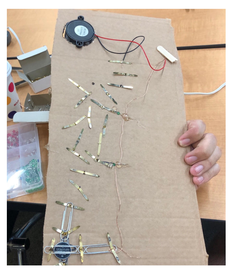


Fig. 5 Maker Philosophy Design Cycle

CRESE
Office: ELB 208
Fig. 6



Circuit Board
Fig. 7

Automata
Fig. 8

Hydraulic Box
Fig. 9

School Site Statistics

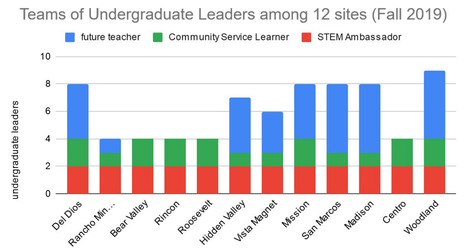


Fig. 3 This semester, our team sizes ranged from four to nine undergraduate students.

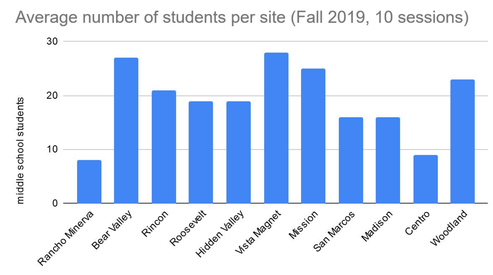


Fig. 4 This semester, our teams could expect to manage groups of up to thirty middle schoolers.

Discussion and Conclusion

The Mobile Making program is a learning experience that has a positive impact on undergraduate students. STEM Ambassadors are able to apply the maker philosophy design concepts that will prepare them for future success. Our teams of leaders develop self-efficacy through trainings and applying STEM concepts to the activities. Students who participate in the CSL program are more likely to join CRESE as STEM Ambassadors. Education students become familiar with integrating STEM in K-8 curriculum. This program gives our undergraduate leaders the opportunity to interact with middle school students and teachers, other undergraduates, and STEM faculty. The main focus of the program is to provide STEM Outreach to K-12 students.

Acknowledgements

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