Practical Application of Robotics Competition for STEM Education

**Abstract**: With more and more robots becoming an integral part of our society, robotics has been recognized to have a great potential for Science, Technology, Engineering and Mathematics (STEM) education. Meanwhile, robotics is multidisciplinary, and it requires an organic integration of resources and an optimized operation such that its impact can be maximized. This paper presents the practice and impact of using a submarine robotics competition (Robosub) to improve the engineering education at California State University, Los Angeles (Cal State LA). First, the organization of this program and its integration to students’ curricular and extracurricular activities are introduced. Moreover, the impacts of this program to student participants, engineering program, and the institution are summarized. In addition, discussion on the existing challenges and possible future solutions are presented.

1. Introduction

< a) importance of robotics in engineering education 🡪 b) challenges, which will lead to the need of our discussion (a good organization is critical of the success)🡪

1. Robosub Competition at Cal State LA
2. Robosub Competition <intro of the competition, and how cal state la got in, and practical challenges for cal state la (budget, student availability(commute school), etc.)>
3. Organization at Cal State LA <student org + senior design teams + advisors + veteran near-peer mentors>
4. Sustainability <how to keep it running>
5. Program Impacts
6. Impact to student participants
7. Impact to engineering program
8. Impact to the institution
9. Further Discussion

<talk about the challenges and possible solutions>

1. Conclusion

<summarize the work presented in this paper>