Interdisciplinary Student Competition for California Polytechnic State University – San Luis Obispo

Forest G. Gobble
California Polytechnic State University, San Luis Obispo
San Luis Obispo, CA

Cal Poly has a reputation for producing some of the best qualified graduates in their respective fields of study. While this is very important, curricular activities involving collaboration between students within the same college are limited (excluding same major). Beyond that, collaboration opportunities across colleges are even more rare. When graduates enter the workforce, many are thrust into highly collaborative environments across various disciplines. Industry professionals have shown a strong desire for young people who have had exposure to realistic problems and experience working with other professions outside of their own field of expertise. The question needing answering is, would a student interdisciplinary competition benefit students & industry? Beyond that, are students interested in such a competition? Three separate surveys were sent out to Cal Poly students. One survey going to each of the targeted colleges. The findings show that students in the College of Business, Engineering, and Architecture and Environmental Design recognize the benefit a competition like this would provide to themselves and industry. The results also show that the majority of students are interested in such a competition.

Key Words: Interdisciplinary, Competition, Cal Poly, Survey, Collaborative

Introduction

Throughout various industries the collaborative process is essential to success. Across various industries, countless meetings, seminars, events, training exercises, and etc. exist to preach one thing. Collaboration. This holds true in construction, engineering, and business. If individuals do not know how to work collaboratively with others, it is unlikely they will succeed as much as those who do know how to work together. In each of the named industries, collaboration takes place across various disciplines. For the construction industry, for example, architects, engineers, managers, and tradesmen all need to collaborate in order to deliver a safe and complete product. Collaboration may be challenging due to the fact many people speak different languages, come from different cultures, and socioeconomic backgrounds. Beyond that, professionals specialize and do not completely understand the intricacies of the other professions with whom they are working. The question is, how can we better prepare people entering the workforce where collaboration will be essential to success?

At California Polytechnic State University (Cal Poly), students in various majors and colleges compete in academic competitions against other schools around the country in order to help better prepare themselves for entering the workforce. This typically involves traveling to a competition far away, extensive preparation, and high-stress situations. Aside from that, Cal Poly students typically compete with students within their own major. It is uncommon for students to compete outside their own college let alone, their major. There are a few competitions where students across majors and colleges compete nationally. However, team sizes are limited so only a select number of students can compete. Additionally, there is no event for Cal Poly students alone.

In order to determine if Cal Poly should host an "in-house" competition, it is critical to gauge student interest before moving forward. This study focuses on Cal Poly's College of Business (OCOB), Engineering (CENG), and Architecture & Environmental Design (CAED). The study aims to determine if Cal Poly Students believe if an interdisciplinary student competition would be beneficial for student learning and if they would be interested in competing.

Literature Review

Collaboration is widely regarded as an essential part of success for the future of architects, engineers, and contractors. As a matter of fact, Engineering News-Record (ENR) claims, "collaboration is a major priority for the American Institute of Architects-Associated General Contractors joint committee" (Abbot & Penney, 2016). This is because they recognize that the once rigid lines of the construction industry are fading, as building systems become much larger in scale and significantly more complex. So how are the people entering the construction industry supposed to prepare themselves to work with unprecedented technologies and methods to successfully deliver a project?

ENR states that "…institutions of higher learning that train future architects, engineers, and contractors" are crucial in preparing students entering those fields for the future (Abbot & Penney, 2016). Universities today encourage students to get involved and participate in extra curricular events in which they gain invaluable experience. Industry professionals are also encouraging collaborative studies across various disciplines. Richard Nguyen, a former Cal Poly student, conducted his senor project on what an interdisciplinary competition for CAED would look like. Throughout Nguyen's research, he discovered "how highly perceived interdisciplinary studies" were by industry professionals (Nguyen, 2018, 3).

When it comes to getting students ready for the world after a university education, academic competitions have been a go-to recipe for success. The kind of experience gained by participating in one of these competitions is increasingly sought out by industry professionals. These academic competitions are so valuable because students "[work] through real-life problems and scenarios that companies have previously encountered and that students may encounter in their future careers" (Johnson, 1). Numerous fundamentals are exercised and tested during these competitions, including several that students will encounter in their respective careers, e.g. creating a schedule, following a budget, ordering materials, and creating thorough documentation. These competitions allow students to gain the experience that they often wouldn't have the opportunity to do – "activities that extend beyond [students'] curriculum" (Schuster, Davol, & Mello, 2006, 1).

Richard Nguyen laid a foundation for what an Interdisciplinary competition can look like for Cal Poly students. He mentioned that the remaining piece of work to be completed before a competition is implemented is a survey to gauge student interest (Nguyen, 2018, 3). With all considerations in mind, this study is designed to do exactly that. This research was done to gauge interest and to see if students believe what the research saying about interdisciplinary studies being the future.

Methodology

Three categories for the competition were selected through working with various faculty and students. It was decided that if this competition were to be implemented then it would be important to have a diverse yet realistic number of categories. This was so students from various colleges could compete

in sensible challenges that would be reflective as to what could be encountered in the real world. The three categories for the purpose of this research were:

- Design Build
- Heavy Civil
- Real Estate Development

Design Build and Heavy Civil were targeted towards CAED and CENG. Real Estate Development was targeted towards CAED and OCOB. Data collection was to be exclusively done through student surveys to collect responses. Each survey was attempting to get at least 30 responses. It was decided that sending out three separate surveys to each college was the best course of action. This way the survey description could be tweaked slightly to be best understood by the intended target audience. One survey was sent to the entire CAED, another to a large group of students in OCOB who were involved with the Cal Poly Real Estate club (CPRE), and the last being sent to the Civil and Environmental Engineering department in the CENG. The decision to target these specific groups was based on the idea that each respective group would be best suited for the proposed categories. For example, a Finance or Real Estate Finance major would be better equipped to handle Real Estate Development questions vs a typical Accounting major. Questions were carefully created and selected while working with various faculty in the OCOB as well as the CAED. Input from students was also extremely valuable in the selection process as well. In order to get the most responses possible, the survey was limited to 10 questions with an additional space for suggestions at the end. The survey was structured in such a way to first generally identify who was responding to the survey. This was to identify which groups of students were more or less interested in such a competition. The questions were as follows:

1) Please select your year in school
2) Please select your major
3) Please select your concentration/minor (if applicable)

The next question was to identify if the respondent had affiliations with competing in academic competitions. This was important information to know to understand how students' interest would be affected by previous or upcoming experience(s) with academic student competitions.

4) Have you ever competed in an academic student competition at university level OR are you currently on a student competition team?

The two proceeding questions were to gauge perceived importance and interest of an interdisciplinary student competition.

5) Do you think an interdisciplinary competition for CAED, CENG, & OCOB students would be beneficial to student learning?
6) Would you be interested in participating in an interdisciplinary competition at Cal Poly?

The following questions were included to best understand the respondents' ideal time commitments and format for the competition. The specific allowable responses are included for the more open-ended question. This helps narrow the complexity for future problem sets.

7) If you were to participate in a competition like this, would you prefer a quarterly or yearly competition?
8) What is the best format for the competition?
    a. 2-day, weekend event
    b. 1 weeklong, after school event

c. Academic break event
d. 3-4-week, part time after school event, with 1 day for presentations
e. Other

The last two questions were to gauge specific interest around the proposed categories and general interest surrounding the entire competition itself.

9) Of the following, which category most intrigues you?
    a. Real Estate Development
    b. Heavy Civil
    c. Design Build
10) If you were able to compete in multiple competitions over time, would that be of interest?

The survey was then sent out via email to each of the aforementioned recipients and given 5 weeks to accrue responses.

Results

The response volume for OCOB and CENG were dissatisfactory in order to achieve a reasonable amount of quantitative data. The lack of responses is likely due to the fact the surveys weren't sent out to the entire college of CENG and OCOB, but rather a specific department / club. For the purposes of this research, the data from OCOB and CENG will still be compared to that of CAED. Responses from each survey were as follows:

- OCOB: 10 responses
- CAED: 112 responses
- CENG: 9 responses

Responses from OCOB showed that third years and above primarily responded to the survey. CENG had primarily third years respond though there were first, second, and fourth years that responded as well. CAED had a fairly even distribution among respondents.

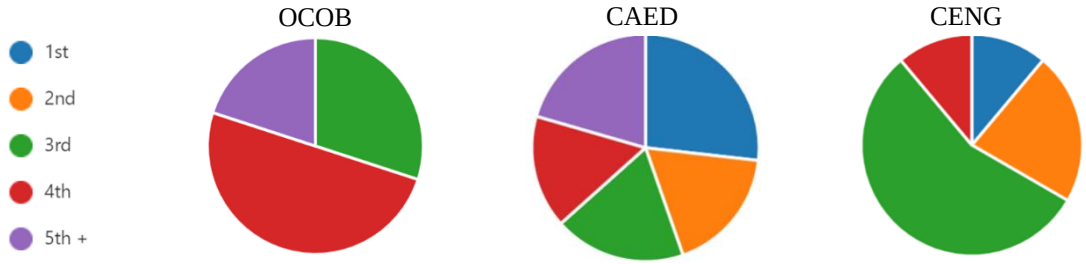

Figure 1: Response to question #1: Please select your year.

Figure 2 shows the breakdown of each major among the respondents. Due to the nature of specific major targeting among the colleges, questions 2 and 3 in the survey will be displayed in figure 2. Outside of CENG, the results show a wide variety of interested students.

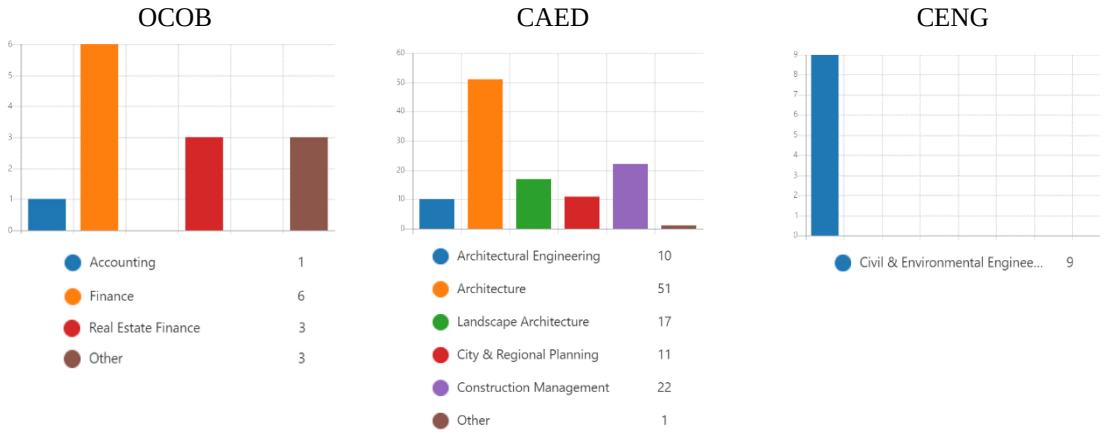

Figure 2: Response to question #2&3: Please select your major.

Figure 3 sheds insight as to the background of academic competition experience student's at Cal Poly have. The results show that a majority of students across these colleges have not participated in academic student competitions.

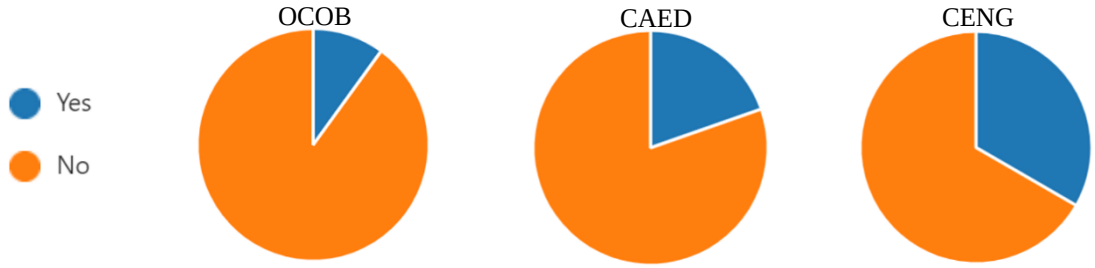

Figure 3: Response to question #4: Have you ever competed in an academic student competition at university level OR are you currently on a student competition team?

The heart of the survey lies within figures 4 and 5. It shows that across each of the surveys that students recognize the benefit to a student, interdisciplinary competition and its potential to contribute to student learning. Figure 5 shows that overall, a majority of students are outright interested in competing in an interdisciplinary competition. More data may need to be collected throughout OCOB.

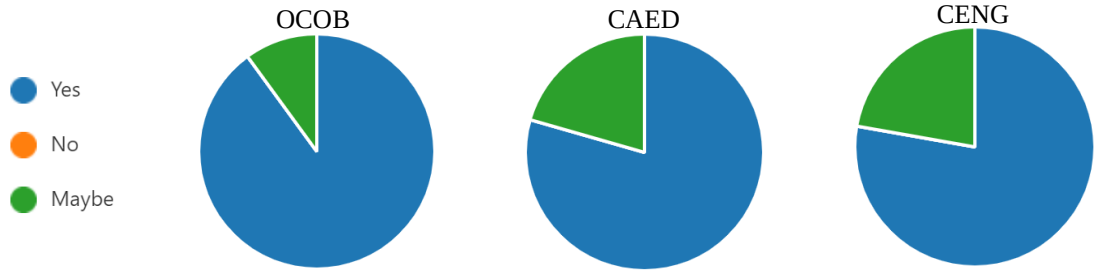

Figure 4: Response to question #5: Do you think an interdisciplinary competition for CAED, CENG, & OCOB students would be beneficial to student learning?

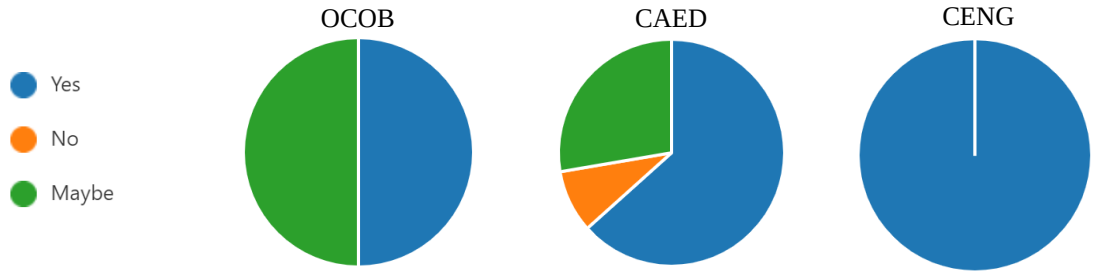

Figure 5: Response to question #6: Would you be interested in participating in an interdisciplinary competition at Cal Poly?

Question 10 is the last crucial question to understanding the student interest level of Cal Poly students. It indicates that students are not opposed to the idea of competing multiple times given the opportunity, however it shows students may need more information or to try the competition in order to make that assessment.

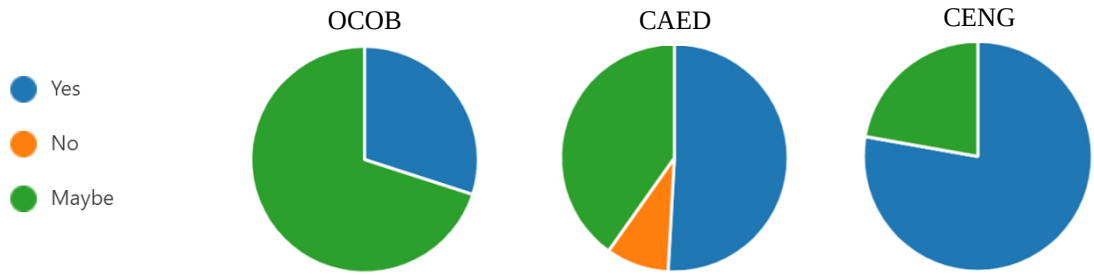

Figure 6: Response to question #10: If you were able to compete in multiple competitions over time, would that be of interest?

Conclusion

Despite low responses from CENG and OCOB, it can unequivocally be concluded that there is recognition from Cal Poly students regarding the benefit this competition to student learning. Students are able to recognize this regardless of their overall minimal competition experience. Additionally, based on two of three surveys the majority said that they would be interested in competing in an interdisciplinary competition such as this. It is clear that students need more information regarding specifics of the competition in order to make an official decision about choosing to compete or not.

Looking back, the surveys sent to OCOB and CENG should have been sent out to the entire college rather than focusing on the specific subgroups. Afterall, the competition is about collaboration, not just collaboration between few.

Moving forward, the CENG and OCOB surveys will likely need to be sent again. Beyond the surveys, competition deliverables need to be clearly defined and the logistics of hosting a competition like this need to be fine tuned in order to have success in this endeavor. This includes reserving a competition space, selecting category sponsors, and setting up the competition so it may be run in perpetuity.

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