An Educational Research Paper on the Integration of Competitive Reno skills & knowledge within the CM curriculum

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The California Polytechnic State University, San Luis Obispo serves as a well-respected university holding a prestigious program within the Construction Management department. The Construction Management program offers a wide variety of courses covering topics of business, engineering, communication, and most of all construction. It utilizes a learn-by-doing motto which greatly aids the students of construction as they are able to experience hands on activities and truly learn the building blocks of the industry. This is one reason why graduates from the Cal Poly construction management program are highly sought after in the construction industry outside of the college as well as highly regarded by industry leaders networking throughout the many ASC student competitions. The Associated Schools of Construction (ASC) is a professional organization of construction educators and industry practitioners that work together for the development and advancement of construction education. The organization and student competitions help to promote the sharing of ideas and knowledge in addition to inspiring, guiding, and promoting excellence in curricula, teaching, research, and service. It’s a beneficial experience providing exposure to construction industry knowledge and an opportunity to network with many industry leaders. It serves as an extracurricular activity for the students in the construction management department although there are many educational opportunities to learn from the ASC competitions. Ultimately, this paper analyzes the perspectives of the students in the Cal Poly construction management major, whom have and have not participated in the competitions, through survey analysis and personal interviews to propose the implementation of the extracurricular skills and knowledge within the CM program. This in hand will help attain the industry knowledge and learning experiences provided at the student competitions to current students in the College of Architecture and Environmental Design as well as future students and competitors participating in the ASC competitions.

Keywords: Cal Poly CM Department, Enhancing Education, Student Competitions, ASC

Introduction

The Construction Management department has led a successful program for the students to grow and learn under for years now. You see it during the everyday activities on campus, during the award ceremonies at the ASC Reno competition, and during your career after college where fellow mustangs hold a large percentage of certain construction companies. The wide range of courses offered provides the students with hands on experiences that give them the capabilities to get ahead in the construction industry. It is a crucial point in the construction management program here at Cal Poly as they properly prepare students for the next step in life by utilizing a learn-by-doing approach implemented within the curriculum. One extracurricular activity that acts as a great stepping tool for the students of the construction management department is the ASC student competitions. The Associated Schools of Construction (ASC) acts as an association comprised of construction educators and industry practitioners that work together for the development and advancement of construction education. The ASC is made up of eight regions that host a plethora of student competitions covering the span on the United States and internationally in areas of Canada and Europe. The organization and student competitions provide an environment open to students to acquire industry ideas and knowledge as well as guiding and promoting excellence in curricula, teaching, research, and service.
The purpose of this paper is to analyze students’ perspectives of the Reno competitions to investigate the acquired values and industry information that can be implemented within the construction management curriculum. Students reap the benefits of competing in the ASC competition as they are able to learn industry standards through networking with the many connections available as well as learning qualities that are needed to perform at the highest ability as a team and individual. This paper will compile information obtained from students through the use of surveys and analyze the results to provide the construction management department with data on student preferences toward the Reno competition correlation to the CM curriculum. It will also attain information through points of contact at current schools that also participate in the competitions that may or may not utilize a system of integrating competitive Reno skills and knowledge within their current courses. Furthermore, this paper will compare results of the survey along with opinions of the different references to decipher what would be best for the curriculum at Cal Poly – San Luis Obispo. The connections made between the pieces of information could be helpful to understand what students see as most applicable from the competitions and what values could be most applicable for the actual curriculum and course load. Ultimately, it is meant to provide the department with data representing student experiences that can be used to improve and strengthen students’ learning abilities and competition performance for the construction management program.

Current Student Competition Education

This research will take a closer look at the current methods related to the organization of student competitions of other competing universities. Brief research and interviews with references of two other colleges will help show a comparison of how student competitions are implemented within each curriculum. The universities examined below include Cal Poly San Luis Obispo, Chico State University, and Sacramento State University.

Cal Poly San Luis Obispo: Cal Poly's Construction Management curricula does not require CM students to participate in ASC competitions. It is based on the volunteer work of students to take part in the competition and take advantage of the great opportunity to network with industry leaders. Current systems in place will be described below:

- No current CM course is designated to the Reno competition
- No class credits are allocated for participation of the competition
- Transportation and competition necessities are funded by the department
- Funding and outreach is done by individual teams for extras such as apparel, information, and support

Although there is no designations for a Reno competition course, Cal Poly proves to be a successful school in all competitions they take part in. Within the Reno event, they demonstrate their strength through leading the number of awards won almost every year as well as being recognized as strong candidates with all construction companies. The system in place within the curriculum proves to be strong, but implementing extracurricular information within the course load can help enhance the education of students for the future.

Chico State University: Chico State's Construction Management department also does not make the competitions a mandatory activity, but provides incentives for students to participate. The incentives for the students can be seen from different viewpoints in regards to benefiting the school and students.

- No current CM course is designated to the Reno competition
- Class credits are allocated for participation of the competition
- Credits due to the competition are classified as tech elective opportunities
- Transportation and competition necessities are funded by the department
- Funding and outreach is done by individual teams for extras such as apparel, information, and support

Chico state has a much different system in place in regards to the Reno competition. They use a distribution of credits through their student participation. Credits are allocated to those taking part in the competition and attendance of how many meetings they previously take part in. The responsibility of the grades given is allocated to the captains which enhances the role of the leader in these groups. Receiving credits for participation in the competition can be seen from different views as it may or may not motivate a student to perform at their best.
Sacramento State University: Similar to Cal Poly San Luis Obispo, Sac State does not require their CM students to participate in ASC competitions. It is based on the volunteer work of students on their own time. Current parameters behind their system are described below:

- No current CM course is designated to the Reno competition
- No class credits are allocated for participation of the competition
- Transportation and competition necessities are funded by the department
- Funding and outreach is done by individual teams for extras such as apparel, information, and support

Sac State proves to have a system quite similar to the one Cal Poly’s CM department currently carries. Although there are no course designations specifically to the competition, Sac State assists their students for the right development in order to perform well in the competitions. Through online research about their curriculum, I found a brochure displaying team descriptions and testimonials regarding the ASC competition, this can be found in the paper references of my senior project binder.

Methodology

The methodology I decided to take for this research paper was through quantitative data collected from the students within the Construction Management Department at Cal Poly as well as brief research on the current methods or courses related to the Reno competition that are being offered by schools who also contain a Construction Management program. The survey that was conducted comprised of eight questions and it examined the perspectives of students whom had or had not participated in the Reno competition previously. It contained questions related to knowledge and values that students of the construction management department were able to derive from the ASC competitions and if the integration of these learning tools and values would be useful within our curriculum. The focus of the survey aimed to analyze whether an implementation of the competition information would be best within an existing course, a new tech elective, or possibly a new independent study. It examined when the students thought it would be best to explore this option along a student’s college career and whether it would be beneficial to not only construction management students, but also students outside this department in the CAED college of Cal Poly. The collection of this data helped provide insight on what construction management students see as missing or useful to learn within their education outside the current curriculum offered. The faculty ultimately makes the final decision regarding learning objectives and information offered, but this data can help serve the mind of the department to tailor the curriculum where they see best fit for the possible implementation of Reno competition skills and knowledge.

Survey

The survey specifically analyzed the following values and knowledge that students typically encountered with the current ASC competition. The responses will help aid the idea of how learning experiences can be implemented within the curriculum:

- What values are seen as most important for the competition
- Which of these values would be most applicable to the current CM curriculum
- What type of course would best fit the knowledge learned from the competition
- At what point in the curriculum do we see this information being taught
- What information cannot be used or applied to the current CM department

The research that was performed examined the possibility of implementing Reno competition knowledge and skills within the current curriculum. By comparing what other colleges with construction management programs offer to their CM students for the competition, we can extract what information and research can be analyzed and help produce what type of integration regarding the competition would be ideal for Cal Poly – San Luis Obispo. Due to such a competitive, learning environment at the Reno competition, it may be beneficial for students of the CM department if it were provided within the curriculum to either learn about or continue to grow from. This would potentially enhance the problems that are normally encountered by students when they network and enter the workforce on independent projects that may require outside resources or a strict discipline to complete the project.
Also, this could result in a higher rate of student success for Cal Poly at the Reno competitions as well as the many other regions the program participates in across the world.

**Interviews**

Interviews were conducted by the phone and via email during the spring quarter with industry members who are also involved with two other universities that take part in the Reno competition. Interviewees included Justin Reginato, a member of Swinerton Builders and professor at Sac State, and James Quigley, a project engineer for Hensel Phelps Construction and construction management alumni from Chico State. Both have been involved with construction education and have acquired different views as a professor and student.

I interviewed Justin Reginato via email with a series of questions regarding the Reno competition and it’s involvement within the Sac State program. What I figured out was surprising as I was expecting more competition knowledge within their department, but found quite the opposite. Through my interview, he stated that “the university does not currently have a designated competition class and in fact is so tight with requirements that we do not have any room for CM electives.” He explained that there are many important qualities to be learned from the competition such as teamwork, fundraising, outreach to industry, and presentation skills. Although some of these qualities can be taught in the classroom, he explains that the pressure the competition creates cannot be replicated in the classroom. This roots from the reasoning that students tend to do the bare minimum associated with their desired grade, while in the competition most teams want to exceed expectations in order to impress the judges and do their best for their fellow group members. The interview was insightful as I was able to make some correlations between what Justin explained about the competition in an educational environment to comments of what students had replied through my survey. One big concept being outreach to industry and fundraising as individual teams (not by the university) may not be taught by the professors, but completed by students and their previous experiences in life. In correlation, most students recognized networking as a piece of information that cannot be taught in the classroom.

Furthermore, I interviewed James Quigley via phone call in which I asked a similar series of questions regarding the Reno competition involvement at Chico State. Through the interview, I discovered that Chico State has a much different system in place than both Cal Poly and Sac State. It did not differ in regards to having a course designated to the competition, but in regards to receiving credits for competing and practicing with their construction teams. The system they have in place does not vary depending on winning or not in their competition category. Team members are given letter grades which in hand fulfills their credits for the competition. What grade they receive is a reflection of how many meetings they attended with their team. Team captains hold the responsibility of assigning a letter grade to each team member in connection with their attendance and work for the competition. When asked if he saw this as beneficial, he stated he believed so for the reason that it holds the students and teams accountable. It forces teams to have required meeting dates where they can help each other better prepare for the competition and can help demonstrate to the department that each team is staying on course. Even though this may be the case, it can also be seen from a different viewpoint in such that a team and it’s members may not be volunteering for the competition in order to win but purely for the incentive of receiving school credits. I see both these responses as very applicable so this sort of method could hinder Cal Poly’s program more than enhance.

**Results and Analysis**

The survey tallied forty-one responses, all from students in the Cal Poly Construction Management program ranging from first years through graduating seniors and alumni. The survey was administered the week of May 23rd through June 1st. A copy of a few survey questions, along with simple graphs of responses for some of the questions can be found in Appendix A. The findings from the surveys indicated that the majority of students believe the Reno competition as a great opportunity to learn from which can also be connected within the curriculum through certain values experienced at the Reno event. Through the series of questions, majority believed these topics could be implemented within an existing, major course in their sophomore year of the program. When asked whether instructions of these topics would be beneficial, one student commented, “yes, interdisciplinary collaboration and team work, time management, preparedness and real life simulations are some of the many things that would be beneficial” (Senior Project Survey, 2016). With the help of the analysis from the students who participated in the
competition, certain teaching methods can be explored in order to better enhance education as well as student performance at the Reno competition.

![Figure 1: Where Reno competition knowledge fits best in curriculum.](image)

Through the survey, 56% of the students believed it would best fit in an existing, major course compared to the 39% who believed it can be implemented as a new, tech elective course. These two areas are where I saw the majority falling under. It shows that students do see competitive, Reno skills and knowledge as a potentially crucial part of the education as it relates to real-life situations they will eventually face later down the road. A descent amount thought it could be utilized in a system as a new tech elective, but it is tough to say what kind of course would fill this demand. As stated before, Chico State has a system in place where credits are given to students who participate in the competition and this similar system could be integrated if the CM department believed a new, tech elective would be needed and most beneficial. Through the comments of students and my references, teamwork and presentation skills prove to be very important parts of the competition. The program that Cal Poly’s construction management department has developed thus far, does implement these aspects through group projects over the course of the flowchart. The competitive, Reno skills and knowledge can be best seen enhancing certain labs the department currently offers the students of the CM department.

Student responses indicated a large inclination towards learning the values and skills of the competition early on. The survey established that 90% of students see it best fit before their junior year of college. 60% of the forty votes taken geared more towards implementing this information their sophomore year in the construction management program, while no one saw it applicable for their senior year (See Figure 2).
This demonstrates the need for the competition information early on for a student in the CM program. Students as a first year or second year may see it as a great opportunity, but potentially shy away from the lack of knowledge they have of the competition. They may perceive themselves as too young or incapable which then results in a lack of participation of the younger students. By implementing competitive, Reno skills and knowledge within the curriculum it may prevent older shadows such as juniors and seniors. Thus, causing a better program of which younger students are shadowed and mentored to establish a more critical role later on.

When given specific values regarding the Reno competition for the survey takers to choose, the values included all the following six choices:

- Leadership
- Work Ethic
- Organization (Pre/During competition)
- Team Selection
- Prior experience
- Networking

The two topics that students saw contributing the most to the curriculum were work ethic and prior experience, which both tied for twenty-one votes. The second most valued topic was organization of the team before and during the competition, which was only one shy vote of being the most valued topic as well. The topic students saw as contributing the least to the program of Cal Poly was networking, which had the low of ten votes. This was interesting as it correlates with other areas of my survey and the interview I had with Justin Reginato, a professor of Sac State. When asked the question of what information cannot be taught in the curriculum, several students stated networking as one of the topics. After discussing with Justin earlier, I also found this to be true as it is not up to the professors and classrooms to force the students out in the industry, but it is up to their own free will of networking and working for companies in order to get their name out there. Figure 3 below shows the discrepancy of the six choices between the students of construction management.
These topics all hold value for the Reno competition and would be beneficial for any student to learn within the educational environment as well as first hand from the competition. Providing students with more exposure to these competition topics would not only help performance, but also the overall marketing to students in the CM department and the whole College of Architecture and Environmental Design. By using different teaching techniques and specific methods focused specifically on the Reno competition, the CM department could help further enhance the education of students and improve upon the current program instilled.

**Conclusion**

Construction management has a history of changing and responding to the market in order to best prepare students for the continually progressing industry it feeds into. Cal Poly does a great job of staying up to date with technological changes within the construction industry in order to produce the most capable and well-suited candidates for any company across the nation. The proposal of Reno competition skills and knowledge within the curriculum would help further enhance the program and would be able to supplement and provide greater knowledge to students that desire to learn more in the educational environment and the construction industry. This educational research paper has utilized data from resources of current students, graduates, and sources of other similar programs in California. Many students and professors have seen the trap of complacency take a huge role within the classroom. Where students will work the bare minimum in order to achieve a letter grade they may or may not value. How can implementing competition knowledge and skills within this same environment change that? With methods and topics that push for a competitive student mindset in the current classrooms as well as in the construction industry they strive to be in. The values and qualities learned from the competition aid students to see a different side of the industry in which they may not be able to recognize within the classroom. Recently, the construction industry has been quickly progressing and proves to be a very competitive market in which technology keeps enhancing projects and companies are seeing a large increase of construction everywhere. By taking advantage of everything the Reno competition has to offer within Cal Poly’s learn by doing motto, the construction management department can help further enhance the education for all students currently here and for the future of the program.

**Appendix A**
References

Associated Schools of Construction Website, (2016). History and Information. URL (http://www.ascweb.org/about/general-information/).

