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Student Perceptions of Construction Program Naming Distinctions

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Across the United States, construction-related academic programs are offered under various titles, such as Construction Management (CM), Construction Engineering (CE), etc. While these programs prepare students for different roles in the construction industry, the naming of these programs can lead to confusion regarding their content and career outcomes. This study examined the impact of academic program names on students' perceptions, focusing on how students interpreted these titles about their construction knowledge and skills. A pilot study was conducted using a questionnaire survey of 113 students enrolled in construction programs at four universities. The findings reveal significant confusion, with 46% of students believing that programs like CM and CE offer equivalent degrees. Additionally, 39% of students thought a bachelor's degree in CM was indistinguishable from a degree in CE. These results highlight the need for more transparent communication regarding the differences between these programs to help students make informed decisions about their education and future careers. Addressing misconceptions early on can improve students' alignment with the right programs, leading to better academic outcomes and career readiness. Moreover, this research provides valuable insights for academic advisors, educators, and administrators, enabling them to guide students more effectively and reduce misunderstandings surrounding program titles.

Keywords: Construction Education, Student Perceptions, Career Choices, Program Names, Program Misunderstandings.

Introduction

The higher education landscape for construction-related programs in the United States includes a variety of degrees such as Construction Management (CM), Construction Engineering (CE), and Construction Engineering Technology (CET). These programs prepare students for distinct roles within the construction industry, each with specific curricular emphases and career outcomes. However, overlapping these program titles and their similar nature can confuse prospective students. This confusion often impacts students' educational choices, making it difficult to align their career goals with the program that best suits their aspirations.

Each program offers a unique focus: CM programs emphasize skills in project oversight, cost estimation, and construction law, equipping students for leadership and management roles in

construction settings. In contrast, CE programs highlight engineering principles, mathematical application, and technical expertise essential for project planning and the execution of architectural designs. Meanwhile, CET programs combine technical and practical training, providing students with hands-on skills for direct management roles in construction projects (Sealey-Morris, 2024). Despite these distinctions, prospective students may need more guidance to navigate these programs effectively, leading to potential misalignment between their academic preparation and career aspirations.

The existing literature has explored curriculum design and career pathways for construction-related degrees but has often overlooked how the titles of these programs impact students' understanding and decision-making processes. For instance, past studies have introduced new tracks within programs—such as Construction Engineering and Management—with collaborative industry elements but without clarifying distinctions between CM and engineering roles (Federle et al., 2011; Franco Duran, 2022; Lee and Kim 2020). While studies such as those by Singh and Hamada (1996) and Chinowsky and Vanegas (1996) emphasize curriculum and skill differences, they do not address how students interpret program names, nor how these names might influence students' academic and career paths. This lack of clarity in program naming and differentiation can lead to misguided student expectations, affecting their educational satisfaction, job satisfaction, and employability in the construction sector.

This research is necessary as the construction industry increasingly demands a workforce with specialized knowledge and skills. Academic institutions play a crucial role in preparing students to meet these demands, and misalignments between student expectations based on program names and the actual curriculum can lead to skill gaps in the workforce. Addressing these potential misconceptions is essential for curriculum designers, academic advisors, and policymakers to better align program content with industry needs, thereby improving student career outcomes and contributing to the effectiveness of the construction workforce.

Literature Review

Research distinguishes between the curricular appeal of different construction-related programs. Sealey-Morris (2024) identifies key differences between CM and CE programs, where CE emphasizes technical skills and foundations in science, mathematics, and business, preparing students for roles in large-scale infrastructure projects. In contrast, CM programs focus on project management, budgeting, client communication, and regulatory compliance, positioning graduates for management roles on construction sites (Abudayyeh et al., 2000). These distinctions suggest that students are drawn to programs based on their specific interests and the skills they hope to develop, thereby aligning their academic paths with career aspirations.

The existing literature on career choices in construction-related fields highlights several factors that motivate students, with interest often serving as a primary driver, while counselors play a relatively limited role in students' decisions to enter construction (Koch et al., 2009). Coskun et al. (2024) suggest that the lack of structured guidance in high schools creates a gap, advocating for enhanced career information to aid students in making more informed choices about construction careers. Studies have also examined the elements that initially draw students to construction programs. Kisi et al. (2011), for instance, found that only 26% of construction students cited CM or CE as their top program choice, indicating a potential need for initiatives to raise awareness about these fields. A related study by Bigelow et al. (2017) highlights that both male and female students are primarily attracted to CM programs by well-defined career opportunities, such as internships, field trips, and relevant work experience.

Additional research emphasizes the importance of early influences, such as family background and role models, in students' decisions to pursue CM, especially among female students (Bennett et al. 1999; Bigelow et al., 2015; Sparkling et al., 2019). High school factors like salary expectations, working conditions, and career development opportunities have also been shown to influence student choices across genders (Chileshe & Haupt, 2010).

While much research addresses curriculum and career outcomes, there is a notable gap regarding how the naming of these programs impacts students' perceptions and decisions. Additional gaps include whether students from freshmen to senior differ in their understanding of the construction program, whether they distinguish the student learning outcomes of different construction programs, and what factors interests them in these programs. Addressing these issues could improve program alignment with student expectations and potentially enhance career satisfaction and industry retention.

Research Objectives

This study aims to fill the gap in understanding by investigating how students perceive the names of construction-related programs and the extent to which they influence their decision-making processes. Specifically, this research seeks to:

1. Explore the extent to which students perceive various construction-related programs (such as CM, CE, CET, Construction Science, and Construction Science and Management) offered by universities across the United States as identical or distinct.
2. Investigate if students' perceptions of construction program names vary based on academic standing, specifically comparing freshmen and sophomores to juniors and seniors.
3. Examine differences in perception of student learning outcomes of different construction programs across academic levels.
4. Examine students' interest in construction related programs.

Methodology

A structured questionnaire survey was developed to collect data on student perceptions of construction-related program names. The survey comprised undergraduate students enrolled in construction-related programs (CM, CE, Construction science and Management, and related majors) across four universities in the United States. Students were surveyed during their undergraduate studies in universities. The first section includes demographic data (e.g., gender, academic level, previous construction experience), while the second section assesses participants' understanding and perceptions of various construction program names and student learning outcomes. The third section examines students' interests in construction programs. Students from all academic levels, ranging from freshmen to seniors, were invited to participate. A total of 113 students completed the survey during those times, representing a balanced distribution across academic levels. Although the sample size is small, it was found to be adequate for the study's goals because it represents undergraduate students from four different universities and includes a range of perspectives from programs related to construction. For greater generalizability, future research to be conducted increasing the sample size.

In order to summarize the information provided by the respondents, the data collected was entered into a spreadsheet-based database that was used to perform descriptive analysis and to generate tables and charts. All the variables were assigned numbers to represent them correctly and to simplify the data entry process. For example, the questions with yes and no responses were entered in database by assigning 1 = yes and 0 = no.

Quantitative data were analyzed using descriptive statistics such as frequencies and percentages were calculated to examine students' perceptions of program similarities and differences. A Chi-Square Test of Independence was conducted to test for statistically significant differences between academic levels (freshmen/sophomores vs. juniors/seniors) in their perceptions of program distinctions. This test was chosen as it is well-suited for assessing relationships between categorical variables. A p-value threshold of 0.05 was used to determine statistical significance.

Results

The researcher received 113 complete responses from the four different institutes across the United States. The survey was administered to students that were enrolled in construction related programs. This section has been subdivided into several other parts to analyze data.

Demography

Within the valid responses received, 88% (99 students) were male and 12% (14students) were female. As shown in Figure 1, there were variations in the level of students who were enrolled in the construction program. There were 36 seniors (32%) compared to 22 freshmen (19%) but the distribution of freshmen combined with sophomores were similar to junior combined with seniors. This was useful when interpreting their perception of construction program naming (described in the later section).

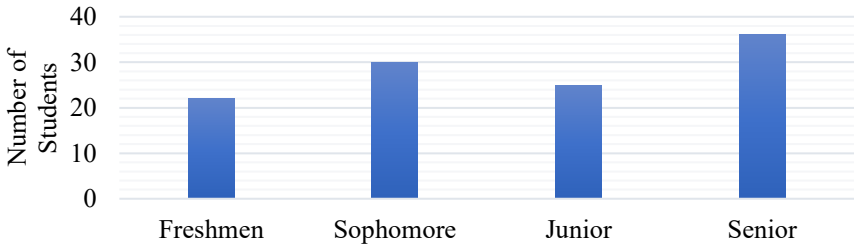

Figure 1. Distribution of student's level

As shown in Figure 2, the students reported whether they had work experience related to construction or related tasks. The result shows that 88% of students had experience related to construction, 65% related to drafting, 33% related to working with architect, and 50% reported that they had worked with engineers.

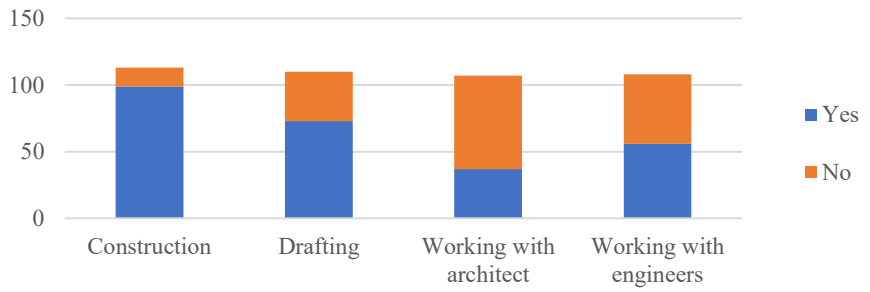

Figure 2. Work experience

Students Perception of Construction Programs

This section delves into participants' overall students' perceptions of construction programs. When students were asked if they think universities across the United States offering construction program with different names such as CM, CE, CET, construction science, and construction science and management were the same degree, 46% (52 students) believed they were the same program as shown in the following Figure 3. Although the result from Figure 2 above shows that all students had experience working related to construction, the result shows that many are still not able to differentiate between the construction program naming. The fact that 46% of respondents thought the three programs were identical points to a possible lack of differentiation between them, which may have an effect on how students make decisions and how well the programs work out. This finding supports the study's statement that students become confused by program titles and curricula that overlap, which is consistent with the introduction's focus on the difficulties prospective students encounter when differentiating between CM, CE, and CET programs. As stated in the introduction, the importance of the finding is examined in light of the possible discrepancy between students' academic preparation and career goals.

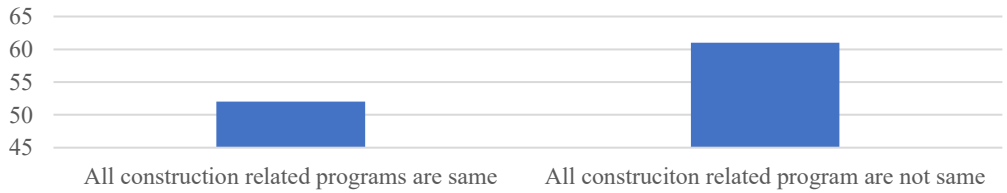

Figure 3. Student's perception of the construction related program

To determine if there is a significant difference between groups of students (freshmen and sophomore versus junior and senior) based on whether they perceived the mentioned construction programs as different, this study conducted the Chi-Square Test of Independence. This specific test was selected because this study used categorical data. In this analysis, senior students were included within the junior-senior group due to a low response rate from seniors (fewer than 30 respondents). This grouping was necessary to maintain statistical robustness, though it may limit insights into specific differences between juniors and seniors. The null hypothesis of this test is there is no significant association between the student groups (freshmen and sophomores versus juniors and seniors) and their perceptions of whether the construction programs are different. In the groups of freshmen and

sophomore and junior and senior, there were 24 and 28 students respectively who stated Yes (all construction related programs are same), 28 and 33 students respectively who stated No (all construction related programs are not same). The details of the data are presented in Table 1. The Chi-Square Test of Independence showed no significant association between student groups (freshmen/sophomores vs. juniors/seniors) and perceptions of program similarity, $\chi^2(1, N = 113) = 0.001$, $p = 0.98$. Given the high p-value, we fail to reject the null hypothesis, indicating no significant association between the student groups (freshmen and sophomores versus juniors and seniors) and their perceptions of the construction programs. This suggests that the perceptions of whether the construction programs are different do not significantly vary between the two student groups.

Table 1. Contingency Table: Student Groups and Their Responses

Group	**Yes**	**No**	**Total**
Freshmen and Sophomore	24	28	52
Junior and Senior	28	33	61
Total	52	61	113

Similarly, the respondents were asked if they think graduating from a degree in CM will have the same student learning outcome (SLO) as graduating from a degree in CET, 54% (61 students) believed they were not the same. To determine if there is a notable difference in how freshmen and sophomores versus juniors and seniors perceive difference in student learning outcomes from different construction programs, a Chi-Square Test of Independence was performed using the data in Table 2. The null hypothesis states that there is no significant link between the student groups (freshmen and sophomores versus juniors and seniors) and their views on SLOs from different construction programs. Table 2 shows that among freshmen and sophomores, 26 students answered "Yes" (indicating they think all construction programs have same SLOs) and 26 answered "No" (indicating they think different construction programs have different SLOs). In the junior and senior group, 26 students answered "Yes," and 35 answered "No." The results indicated no significant association, $\chi^2(1, N = 113) = 0.62$, $p = .43$. Therefore, we fail to reject the null hypothesis, suggesting that students' perceptions of program distinctions of SLOs do not significantly differ between academic levels.

Table 3. Contingency Table: Student Groups and Their Responses

Group	**Yes**	**No**	**Total**
Freshmen and Sophomore	26	26	52
Junior and Senior	26	35	61
Total	52	61	113

Students Interest in Construction-related Programs

This section delves into overall students' interest of construction programs such as CM, CE, and CET. When students were asked which construction program do they think is easy to graduate, 73% (83 students) believed CM is easy to graduate, while only 11% (12 students) and 25% (28 students) believed CE and CET respectively as shown in Figure 4.

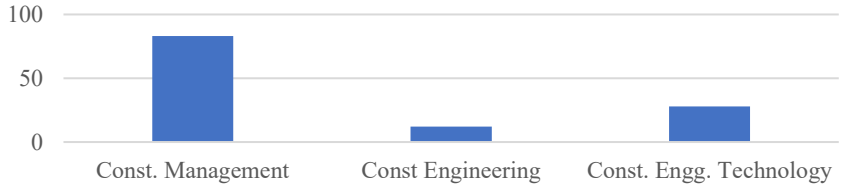

Figure 4. Student's perception on easy to graduate construction programs

In the follow-up question on why students interest would differ from one to another construction programs, the results shown in Figure 5 indicates that students prefer CM because of high business (84% responses), high hands on (64% responses), and less mathematics requirements (76% responses). Similarly, construction engineering is preferred because students believe that it has high mathematics requirements (47% responses) compared to other factors as shown in Figure 5. Similarly, students' preference to CET was due to less business requirements.

The findings reveal notable insights into students' perceptions of different construction programs, shedding light on misconceptions and factors influencing their preferences. A substantial portion of students (73%) viewed CM as the easiest to graduate from, compared to only 11% and 25% for CE and CET, respectively. This perception may reflect the broader appeal of CM programs for students seeking fewer mathematical requirements, higher business orientation, and hands-on opportunities, as evidenced by the high percentage of students who valued these attributes in CM programs. Such preferences highlight an inclination toward curricula that prioritize applied learning and business-focused skills, potentially drawing students who aim for management and oversight roles rather than highly technical or engineering-intensive positions.

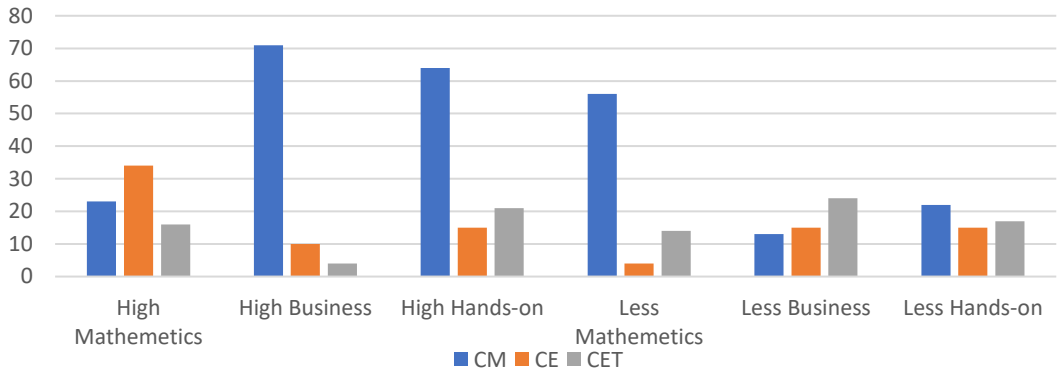

Figure 5. Student's preferences on construction programs

Discussion

The survey conducted in this study was focused on undergraduate students from four universities. The students were enrolled in construction-related programs during their undergraduate studies, such as

CM, CE, CET, and other related majors as explained above sections. The survey data variables utilized in this study were chosen based on intuition in order to achieve the goals of the study.

The differences in program preferences also underscore students' awareness of curriculum content, even as they need clarification about the distinctions among program names. For instance, while students acknowledged that CE demands more mathematics, they also indicated a preference for CET programs due to the reduced emphasis on business courses, suggesting a preference alignment with personal strengths and career expectations. These findings indicate that students' choices in construction-related education are guided by perceptions of curriculum structure and subject requirements rather than program nomenclature, which needs to be more understood. Previous research by Koch et al. (2009) and Sealey-Morris (2024) demonstrated how clearly specified curricula in programs related to construction aligned student expectations. The results of this study support the findings of prior studies and highlight the continued necessity of program clarity, especially for the 46% of participants who reported feeling confused. However, the study's distinctive contribution is that it shows that almost half of the respondents are still unsure about how different programs differ from one another. As mentioned in the literature review, this conclusion emphasizes the need of education for high school graduates and need of more precise program naming rules.

Despite this, results show no significant link between student groups (freshmen and sophomores combined versus juniors and seniors combined) and their views on the similarities or differences among construction-related programs and their SLOs. The Chi-Square Test of Independence for both datasets, as seen in Table 1 and Table 2, returned high p-values (0.98 and 0.43, respectively). These high p-values (more than 0.05) indicate that students in these combined groups generally share similar opinions on whether construction programs differ, suggesting that factors other than academic progression may shape these perceptions. This result implies that students' views may be shaped by factors independent of their academic progression, such as personal interests, previous coursework, or peer influence, rather than by advancing knowledge of program specifics.

Conclusion

This study highlights a notable gap in students' understanding of the distinctions between various construction-related academic programs. Nearly half of the students (46%) surveyed perceive these program names as equivalent, suggesting that differences in program names, focus, and career pathways may need to be clearly communicated or understood. Misconceptions about program names and a preference for curricula that match personal strengths in business, hands-on experience, and mathematics influence students' educational choices and career paths within the construction field. Despite most construction-related work experience, this lack of differentiation suggests a prevalent misunderstanding of program distinctions. Furthermore, the lack of significant variation in perceptions between lower- and upper-level students, as demonstrated by high p-values in the Chi-Square tests, indicates that academic progression alone does not significantly influence students' awareness of program distinctions. These findings underscore the need for improved academic guidance and clearer program communication to ensure students select construction programs aligned with their career goals and interests.

Due to a limited response rate, freshmen students were combined with sophomores and juniors with seniors to maintain statistical robustness. Further research with a larger sample of senior students

could provide a more detailed understanding of how perceptions might change closer to graduation, offering a nuanced view of how career outlooks influence student's understanding of program distinctions.

The authors would want to suggest that educational institutions do things like modify program nomenclature to avoid misunderstanding and adopt more effective student counseling. These suggestions are in line with demands made in the literature to better assist students in matching their academic choices with their career objectives (e.g., Coskun et al., 2024; Kisi et al., 2011).

Further Study

Future research should explore the underlying factors shaping students' perceptions of construction program similarities and differences, such as prior exposure to industry information, mentorship, and family background. Separating juniors and seniors in further studies could also provide a deeper understanding of how proximity to graduation and workforce entry might impact students' awareness of program-specific skills and outcomes. Additionally, longitudinal studies tracking changes in students' perceptions over their academic journey may reveal more about the evolving understanding of program distinctions and the factors influencing them.

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