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Sense of Belonging and Construction Industry Experience: A Preliminary Exploration

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A student's perceived sense of belonging within a university community is a predictor of higher education degree attainment. As such, an increased understanding of the factors that support sense of belonging among students is important to increasing the number of university graduates in high-demand professions such as construction management. This manuscript focuses on differences in construction and construction education sense of belonging between undergraduate construction students with more than 480 hours (approximately 3 months) of construction industry work experience and undergraduate students with less than 480 hours of construction industry work experience. Overall, students with more than three months of construction work experience reported higher levels of sense of belonging than their less experienced peers. Preliminary results suggest that further research and analysis to understand the correlation between work experience and sense of belonging is warranted.

Keywords: Sense of Belonging, Construction Education, Work Experience

Introduction

A desire to create interpersonal connections and experience a sense of belonging and inclusion is an intrinsic human driver that is linked to cognitive and emotional well-being (Baumeister & Leary, 1995). In higher education, a student's sense of belonging within an academic institution has been correlated with numerous positive personal and academic outcomes, including increased enjoyment and desire to persist in university (Pedler et al., 2021; Fourie, 2020). Developing and supporting students' sense of belonging during the first year of tertiary coursework is particularly important to student university persistence, as students are most likely to drop out during this time period. As such, numerous academic studies and university interventions focus on this subject (Marshall et al., 2012; Tinto, 1993). The improved academic outcomes associated with cultivating higher levels of student sense of belonging have been particularly beneficial in support of traditionally underserved student populations in higher education (Hansen et al., 2024). While a concerted research focus has been placed on the positive effects of university-level sense of belonging for first year students, the effects of sense of belonging during subsequent years of higher education enrollment, in major-specific student retention, or in major-specific professional development are less understood.

An improved understanding of the factors that contribute to, or deter from, students' sense of belonging could be particularly important to retaining students in academic majors such as

construction management, which have "much faster-than-average" levels of projected workforce demand for the upcoming decade (BLS, 2025). To date, the majority of construction-specific academic research on student sense of belonging has focused on understanding gender or other demographic-based differences (Debs et al., 2025; Debs & Kota, 2021; Sauer et al., 2019) or the factors that specifically affect female sense of belonging in construction higher education (Quezada-Espinoza et al., 2023; Burgoon et al., 2023). While understanding group differences in perceived sense of belonging is vital to attracting more individuals with varied lived experiences and backgrounds to meet projected workforce demands, understanding the effects of different experiences, such as professional work experience or professional academic internships, on construction and construction education sense of belonging could also be valuable in supporting workforce development efforts. Specifically, other non-cognitive factors, such as construction education self-efficacy, have been positively correlated with professional work experience (Elliott et al., 2016). Accordingly, this manuscript explores differences in sense of belonging factors in construction higher education and the professional construction community between undergraduate students with higher versus lower levels of construction industry experience.

Background and Literature Overview

The following section briefly explores the background and literature associated with sense of belonging in construction and construction education.

The concepts discussed by Baumeister and Leary (1995) on the fundamental human desire to experience connection and belonging are foundational to many of the first-year experiences implemented at residential universities and colleges in their efforts to support students and increase first-year student retention (Tinto, 1993). While the academic literature is not set on the definition of "sense of belonging," the concepts, at least as they relate to a higher education environment, are captured in a definition provided by Strayhorn (2018, p. 5): "In terms of college, sense of belonging refers to students' perceived social support on campus, a feeling or sensation of connectedness, and the experience of mattering or feeling cared about, accepted, respected, valued by, and important to the campus community or others on campus such as faculty, staff, and peers."

While the construction industry and construction higher education have long recognized the cultural and social barriers, both internal and external, that deter and attract individuals and specific groups of individuals from working in the construction industry or pursuing a construction related degree (Oo et al., 2019; Bigelow et al., 2018), literature specifically referencing sense of belonging in construction education is relatively new and therefore limited. Debs and Kota (2021) explored differences between males and females in numerous areas related to construction sense of belonging. Among the key findings of the study was a perception that females were not as good a "fit" for the jobsite as males and that females experienced a lower sense of belonging than males. A similar study performed by Debs et al. (2025) reported comparable results with females reporting lower levels of belonging and more likely to perceive gender bias within the construction industry. Utilizing semi-structured qualitative interviews with Latinx students, Burgoon et al. (2023) identified the perception that male colleagues "take over" during hands-on assignments and that "guys" have more work experience as factors that potentially deter from female sense of belonging. Conversely, areas of support included volunteering, university clubs, and participation on a student completion team. In comparison to other non-cognitive factors relevant to construction students, such as self-efficacy and sense of community, where females report higher or similar levels to males, sense of belonging appears to be unique and therefore a topic worth exploration (Sauer et al., 2019; Elliott et al., 2016).

Given the limited scope of the current literature on construction students' sense of belonging, which predominantly focuses on gender differences, this manuscript will focus on differences in students' sense of belonging based on construction work experience. This topic was chosen because construction work experience is correlated with higher levels of non-cognitive success factors, such as construction self-efficacy and motivation, and student work experience is already embedded in the curriculum or culture of many construction education programs (Elliott et al., 2016).

Methodology

This manuscript focuses on differences in students' sense of belonging between: 1) students who self-reported more than 480 hours of construction work experience and 2) students with less than 480 hours of experience. The cutoff of 480 hours was chosen because it is the approximate number of hours worked during a single summer work experience or internship (12-weeks).

This study utilized a sense of belonging survey published by Debs et al. (2025). The survey was developed based on factors that affect construction students' sense of belonging in construction higher education and the professional construction community more broadly. The 19 survey questions (Table 1) focus on broad categories related to perceived sense of belonging; these include perceptions of: 1) support from family, 2) support from friends, 3) connection with instructors, 4) comfort with construction program peers, 5) personal future in the construction industry, 6) group and personal challenges, and 7) gender differences in construction. While not a validated survey instrument with multiple sense of belonging constructs, these overarching categories cover many of the diverse ways in which students may perceive a sense of belonging (or lack thereof) within the construction community and in construction education.

Table 1. Sense of Belonging (SoB) Survey Questions

Number	Description
SoB3.1	My family supports my decision to pursue a degree in construction.
SoB3.2	My family approves my choice of career
SoB3.3	My friends support my decision to pursue a degree in construction
SoB3.4	Instructors in my program are truly concerned about me
SoB3.5	Instructors in my program motivate me to become a better construction professional
SoB3.6	Instructors in my program value me
SoB3.7	I am comfortable interacting with instructors in my program
SoB3.8	I feel comfortable interacting with other students in my program
SoB3.9	My classmates are reluctant to team up with me on group projects
SoB3.10	I need to constantly prove myself to be acknowledged by other students in my program
SoB3.11	I am friends with other students in my program
SoB3.12	I see myself working in the construction industry (jobsite or office) 5 years from now
SoB3.13	I see myself working in the construction industry (jobsite or office) for the rest of my life

SoB3.14	Family care expectations may pose a barrier working in the construction industry long term
SoB3.15	I feel that I am a member of the construction community
SoB3.16	There is gender discrimination in the construction field
SoB3.17	Men are more capable than women in the construction domain
SoB3.18	Women in construction are better fit for office jobs rather than being on the jobsite
SoB3.19	I feel recruiters for construction companies prefer hiring males over females for jobsite related positions

Debs et al. (2025)

Survey participants were 4-year undergraduate construction degree-seeking students with at least one year of completed coursework. Survey participants originated from two universities in the states of Texas and Oklahoma in the United States. The survey was distributed via email from academic faculty to the undergraduate students during the summer of 2025. The summer was selected because it is a time when many construction education students are working in the construction industry through a formal academic internship or an informal summer work experience. This research will be delimited to a focus on construction work experience and domain-specific sense of belonging. Prior to survey dissemination, Institutional Review Board (IRB) approval was obtained.

Results

Demographic

In total, 174 undergraduate student participants completed the construction education domain-specific sense of belonging survey. As per the IRB protocol, students were not required to answer all the questions in the survey, and therefore, the number of answers to each question varied. For reporting, survey respondents were divided into two groups based on total reported workhours. Group 1 consisted of all students who reported less than 480 hours (approximately 3 months full-time) of construction work experience, and Group 2 consisted of all students who reported more than 480 hours of work experience. As shown in Figure 1, Group 1 and Group 2 consisted of 86 (41+45) students and 88 (39+49) students, respectively. In Group 1, 81.4% of the students responded to the SoB questions (n=70), and 78.4% of the students in Group 2 responded to the SoB questions (n=69)

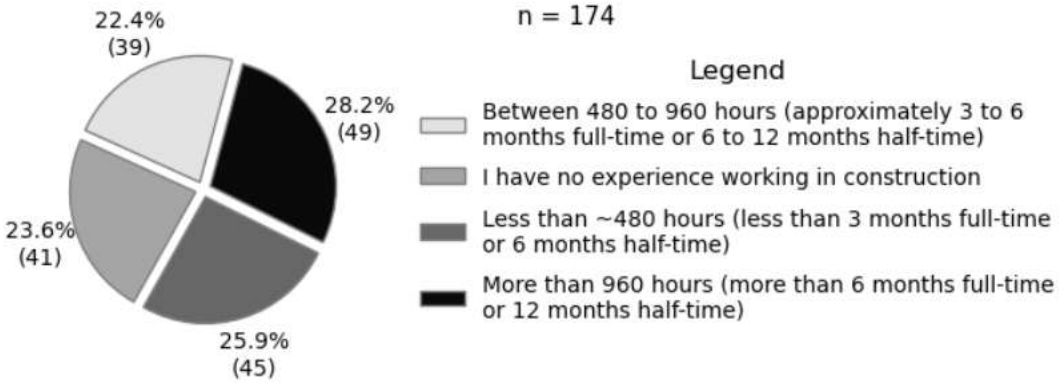

Figure 1. Distribution of Students Based on Hours of Work Experience.

Sense of Belonging

As previously mentioned, the concept of sense of belonging could play a critical role in understanding students' engagement, motivation, and persistence within academic and professional environments. In construction education, assessing students' feelings of inclusion, support, and connection is particularly important. The items presented in Table 1 capture multiple dimensions in a structured list of 19 items (SoB3.1 to SoB3.19), which were provided to the participants to assess students' sense of belonging within the context of a construction education program. Each statement reflects a different dimension of the student experience—ranging from personal support systems to interactions with peers and instructors, and perceptions of inclusion and bias within the field of construction.

Each row in Table 2 represents a specific survey item (SoB3.x) with corresponding mean, median, and standard deviation (SD) of the two groups of students' responses. Additionally, the Mann-Whitney U two-tailed test was used to determine the p-value (also shown in Table 2). P-values below 0.05 were considered statistically significantly different and were highlighted with an *.

Table 2. Measure of Central Tendency discriminated by group

Item	Group #1 (Work Hours < 480) n=70			Group #2 (Work Hours ≥ 480) n=69			p-value
	Mean	Median	SD	Mean	Median	SD	
SoB3.1	4.30	5.0	1.23	4.55	5.0	1.02	0.148
SoB3.2	4.44	5.0	1.12	4.51	5.0	1.07	0.734
SoB3.3	4.47	5.0	1.10	4.59	5.0	0.94	0.554
SoB3.4	3.07	3.0	1.28	3.71	4.0	1.25	**0.002***
SoB3.5	3.97	4.0	0.87	4.26	5.0	0.98	**0.017***
SoB3.6	3.81	4.0	0.89	3.99	4.0	1.09	0.125
SoB3.7	4.09	4.0	0.96	4.38	5.0	0.88	**0.043***
SoB3.8	4.03	4.0	0.98	4.52	5.0	0.78	**0.001***
SoB3.9	2.87	3.0	1.10	2.99	3.0	1.48	0.721
SoB3.10	2.83	3.0	1.17	2.57	3.0	1.24	0.166
SoB3.11	4.01	4.0	1.01	4.13	4.0	1.14	0.230
SoB3.12	4.46	5.0	0.99	4.67	5.0	0.76	0.140
SoB3.13	3.87	4.0	1.13	4.20	4.0	0.98	0.071
SoB3.14	3.24	3.0	1.16	3.26	3.0	1.32	0.921
SoB3.15	3.46	3.0	1.10	4.22	4.0	0.87	**0.000***
SoB3.16	2.96	3.0	1.23	2.97	3.0	1.22	0.978
SoB3.17	2.33	2.0	1.28	2.51	3.0	1.17	0.301
SoB3.18	2.11	2.0	1.14	2.41	2.0	1.28	0.200
SoB3.19	3.23	3.0	1.18	3.06	3.0	1.20	0.384

* p-value <0.05 statistically significant differences

Support from Family

Questions SoB3.1 and SoB3.2 focus on family support for construction education and construction as a career. Both groups report high levels of family support in pursuing construction degrees. While not statistically significant, SoB3.1 shows a slightly higher mean for Group 2 (4.55), those with over 480 hours of work experience, versus Group 1 (4.30), those with less than 480 hours, with both medians at 5.0. SoB3.2 follows the same trend with slightly higher support for Group 2 (4.51) versus Group 1 (4.44). Results suggest that students with and without 480 hours of construction work experience perceive strong familial validation and support.

Support from Friends

SoB3.3 focused on support from friends, with both groups reporting high levels of peer support. Group 2, again, reported marginally higher mean scores than Group 1 (4.59 versus 4.47), with medians consistent at 5.0. These findings support the premise that construction students feel supported by peers in their academic major selection.

Instructors' Concern and Motivation

Students' perception of instructor concern and connection was measured through SoB3.4, SoB3.5, SoB3.6, and SoB3.7. Regarding students' perception of whether their instructors are "truly concerned about" them, SoB3.4, the mean scores were significantly lower ($p=0.002$) for Group 1 than Group 2 (3.07 and 3.71, respectively), suggesting that students with less work experience perceive less personal connection or support from instructors. SoB3.5 explored the effects of instructors on students becoming better construction professionals. Group 2 (4.26) had a significantly ($p=0.017$) higher mean than Group 1 (3.97), indicating more perceived motivation from instructors among experienced students. While not statistically significant ($p=0.125$), the perception that instructors value students (SoB3.6), follows a similar pattern, among Group 2 (3.99) and Group 1 (3.81) students, suggests that exposure to professional environments may help students feel more valued academically. Comfort interacting with instructors, SoB3.7, also improved significantly ($p=0.043$) for students with more than 480 hours of work experience (4.38 versus 4.09). Together, these point to a consistent pattern: students with at least 480 hours of work experience feel more connected, supported, and comfortable with instructors, possibly due to maturity, confidence, length of time in the program, or practical alignment with academic content.

Comfort with Peers

Two questions focused on comfort interacting with peers, SoB3.8 and SoB3.11. Comfort interacting with peers (SoB3.8) was statistically higher ($p=0.001$) among Group 2 students (4.52 versus 4.03), suggesting that work experience is correlated with peer confidence and collaboration. Group 2 also reported non-significant, but slightly higher, mean scores (4.13 vs 4.01). Jointly, it appears work experience is correlated with peer social integration.

Group and Personal Challenges

Survey questions SoB3.9 and SoB3.10 focus on teaming up with or comparison to academic classmates, and are both negatively worded questions (i.e., "I need to constantly prove myself"), meaning a lower score is indicative of a higher perceived sense of belonging; The mean scores between Groups 1 and 2 for SoB3.9 were relatively similar (2.87 and 2.99). Differing from previous

results, Group 2 students reported slightly higher levels of peer reluctance to team up during group assignments, but these results were not statistically significant. Conversely, Group 2 students, through SoB3.10, reported lower mean levels (2.57 versus 2.83) of needing to prove themselves to peers.

Future in Construction

Questions SoB3.12 and SoB3.13 focused on a perceived future in the construction industry and a barrier, family expectations, to that future. In terms of a 5-year plan, SoB3.12, both groups reported high (i.e., optimistic) numbers, with Group 2 students having the highest (4.67 versus 4.46). Projected over a lifetime versus 5 years, SoB3.13, overall mean scores decreased for both groups, but still remained higher for Group 2 students (4.20 versus 3.87). While these differences did not exceed the p-value <0.05 set in this study, significance results for SoB3.13 ($p=0.071$) suggest a potentially greater lifetime commitment to the construction industry for students with more than 480 hours of work experience.

Gender-Related Perceptions

Questions SoB3.16, SoB3.17, SoB3.18, and SoB3.19 all explore gender-specific perceptions in the construction industry. In a similar area, SoB3.14 explored a perceived future in the construction industry based on family care expectations. While certainly not gender-specific, past research has identified long-hour culture and work-life balance (e.g., family care expectations) as factors that potentially deter women from construction professions, with less known about the correlation for men (Debs & Kota, 2021; Tijani, 2022). SoB3.14 was negligible for Group 1 and Group 2 (3.24 and 3.26), showing no major difference in perceived family-related limitations. SoB3.16 was nearly equal (2.96 and 2.97), suggesting general acknowledgment of gender issues in construction, regardless of experience.

Question SoB3.17 asked about men being more capable than women in the construction field, and arguably, a lower score is preferred over a higher score in terms of workforce development, as a higher score represents the view that men are more capable than women. Group 2 reported a higher mean than Group 1 (2.51 versus 2.33). Additionally, when asked about women being a better fit for the office than the jobsite (SoB3.18), Group 2 followed a similar pattern by reporting higher agreement that women are better suited for the office than the jobsite than Group 1 (2.41 versus 2.11). While the difference between Group 1 and Group 2 for both of these questions is not statistically significant, the results are noteworthy because they represent two of the three instances where students with more than 480 hours of work experience reported less favorable means on sense of belonging factors.

Discussion, Conclusion, and Future Research

This manuscript explored differences in construction education domain-specific sense of belonging between students with at least three months of construction work experience and those with less. Overall, survey participants with over three months of construction work experience reported higher mean levels of sense of belonging in almost all areas. Furthermore, student perception of construction faculty, comfort with peers, and feeling that they are "a member of the construction community," all showed increased statistically significant levels for students with increased work experience. These preliminary results are quite positive and suggest potentially positive benefits to construction education-specific sense of belonging, which, in turn, is likely correlated with improved university and academic major persistence. Findings suggest that integrating internships, cooperative education,

or hands-on fieldwork early in academic programs could play a critical role in boosting faculty-student connections and sense of belonging within the construction community.

While students with multi-month first-hand professional experience in the construction industry reported higher mean scores in numerous areas related to sense of belonging, it is noteworthy to mention that one of the few areas where students with more than 480 hours of work experience scored less favorably than students with less than 480 hours is in their scoring of the role of women within the construction workforce. While not statistically significant in this study, previous research has identified the broader industry challenges regarding gender equity in the construction workforce and sense of belonging (Debs & Kota, 2021). As such, future data collection and analysis could be performed to: 1) identify if these gender biases are correlated with increased work experience and by whom, 2) identify the effects of these biases on women students' sense of belonging, and 3) what outcomes these biases may have on student and workforce recruitment and retention.

The results reported in this manuscript indicate the need for future research regarding sense of belonging and construction industry experience. While students with work experience reported higher levels of belonging in numerous areas, a more robust sampling could provide stronger statistical evidence than the results presented here. Furthermore, a more nuanced approach to data analysis based on demographics, academic year within the construction program, and the nature of the work experience (i.e., construction trades, management internship, etc.) could further elucidate factors that lead to potential correlations between sense of belonging and work experience.

AI Disclosure Statement

The authors disclose the use of a large language model, Gemini 3.0. The tool was utilized in the copy-editing process. All copy-edits were made selectively.

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