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Building Better Teams: CliftonStrengths Assessment in Construction Management Education

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The construction industry needs a talented workforce with diverse skills to manage projects and people effectively. Identifying the strengths of the new generation construction workforce is critical for building effective teams and ensuring project success. Moreover, the multidisciplinary nature of the construction industry requires collaboration between several stakeholders, integrating technical expertise and soft skills to perform better in a team environment. The study focuses on the relationships among the Clifton assessment's four domains of Executing, Influencing, Relationship Building, and Strategic Thinking within the student cohort utilizing a correlation analysis. The results revealed that the top five strengths identified were "Relator," "Restorative", "Achiever", "Futuristic" and "Competition" while "Connectedness" was the least common strength identified among the participating students. Further analysis showed moderate to weak negative correlations between the domains, indicating that strengths in one area may be the opposite in other strengths. Overall, the study highlights the potential of the CliftonStrengths assessment as a tool for identifying and utilizing students' strengths to enhance team building in construction management education.

Keywords: Leadership, CliftonStrengths, Teamwork, Strengths

Introduction and Background

Effective teamwork plays a critical role in the construction industry, where successful projects require coordinated efforts of various stakeholders, such as architects, engineers, project managers, and skilled tradespeople. Leveraging the strengths and addressing the weaknesses of team members creates high-performing teams, which is critical for improving project outcomes and organizational success. In addition, retirements and increasing workforce shortages require more work to be completed with limited resources (ABC, 2023). Together with this, the construction industry experienced value in identifying employee strengths and weaknesses to help build effective teams (Milosevic, 2010).

The theory of strength development, with more than seven decades of history, has an emphasis on abilities and capacities rather than weaknesses (Hodges & Harter, 2005; Biswas-Diener et al., 2011; Holton, 2018). Among several types of assessments developed to identify strengths, CliftonStrengths (formerly StrengthsFinder) by Gallup Organization has gained significant recognition and wide acceptance. Donald Clifton, an educational psychologist, developed this tool in the 1990s as part of the positive psychology movement, believing that individuals perform better when building on their

talents rather than focusing on their weaknesses. This approach leads to higher levels of engagement, performance, and personal fulfillment (Clifton & Harter, 2003). CliftonStrengths identifies 34 themes of strengths, which are later categorized into four domains: (i) Executing, (ii) Influencing, (iii) Relationship Building, and (iv) Strategic Thinking (Gallup, 2024a), as shown in Table 1.

Table 1. Strengths and leadership domains by CliftonStrengths (Gallup, 2024a)

The Four Domains of Leadership Strengths by CliftonStrengths			
Executing	**Influencing**	**Relationship Building**	**Strategic Thinking**
Achiever	Activator	Adaptability	Analytical
Arranger	Command	Developer	Context
Belief	Communication	Connectedness	Futuristic
Consistency	Competition	Empathy	Ideation
Deliberative	Maximizer	Harmony	Input
Discipline	Self-Assurance	Includer	Intellection
Focus	Significance	Individualization	Learner
Responsibility	Woo	Positivity	Strategic
Restorative		Relator	

Strengths in the *Executing* domain mainly focus on making things happen. Individuals with strengths in this area often are more successful in completing tasks that require organization, planning, and follow-ups. The *Influencing* domain is characterized by the ability to influence others and lead change. Strengths in this domain include support for effective communication. The *Relationship Building* domain includes strengths that support the development and maintenance of relationships, which are focused on being empathetic and skilled in creating connections with others. Finally, *Strategic Thinking* emphasizes the ability of critical and analytical thinking. Individuals with these strengths tend to showcase problem-solving skills, generating innovative ideas (Asplund et al., 2014).

CliftonStrengths assessment has been utilized in several studies, ranging from education to organizational level ones (Louis, 2012; Lorimer & Davis, 2015; Soria & Stubblefield, 2015; Shelley et al., 2017; Busch & Davis, 2017; Read-Daily et al., 2018; Eble-Hankins et al., 2021; Ryan & Mosher, 2020; Pierre & Okstad, 2021; Watkins et al. 2022; Bono et al., 2023). Considering the diversity of these applications, this study specifically reviewed the use of CliftonStrengths assessment in higher education, with a focus on construction management and STEM and engineering education in the current literature. The literature review involved exploring sources within Web of Science, Scopus, and Google Scholar databases with the keywords “CliftonStrengths”, “StrengthsFinder”, “assessment”, “education, “STEM”, “construction management”, and “engineering”. Very few studies were observed that utilized strengths assessments in STEM and engineering education for team building, with no studies conducted in the context of construction management education.

For example, Eble-Hankins et al. (2021) utilized the CliftonStrengths assessment in an architectural engineering summer internship course and a capstone course. Students completed the CliftonStrengths assessment during the second week of the course, reflecting on how their strengths are related to their internship experiences. The primary purpose of these reflections was to challenge students to identify specific examples of their strengths during their internships. Following the internship course, students applied the results of their CliftonStrengths assessment in the capstone project to better understand their group’s strengths while addressing any potential gaps. These activities enhanced students’ awareness of how to effectively use their individual strengths within a team environment. Ryan and Mosher’s (2020) study on the CliftonStrengths assessment explored technology and engineering students’ perceptions of strengths and success. Their study found that while students did not associate

their strengths with academic success, they did recognize the value of strengths in teamwork. These studies highlight the potential of such assessments to increase awareness of students' individual strengths in a team environment.

This study aims to identify the critical strengths of undergraduate students in a construction management capstone course through the CliftonStrengths assessment, where students' strengths were incorporated into team-building efforts as part of the course. Additionally, the study examines the relationships among the assessment's four domains within the student cohort utilizing the correlation analysis. Overall, this study demonstrates the potential of the CliftonStrengths assessment as a tool for identifying and utilizing students' strengths to enhance team building in construction management education.

Methodology and Data Collection

A case study approach was utilized in this study within two steps: (i) utilizing CliftonStrengths assessment in a construction management capstone course to identify the critical strengths of undergraduate students for team building and (ii) examining relationships among the assessment's four domains within the student cohort utilizing a correlation analysis, as illustrated in Figure 1. Following the first two steps, the results were analyzed to present the potential of using the assessment to provide insights for improved team building in construction management education.

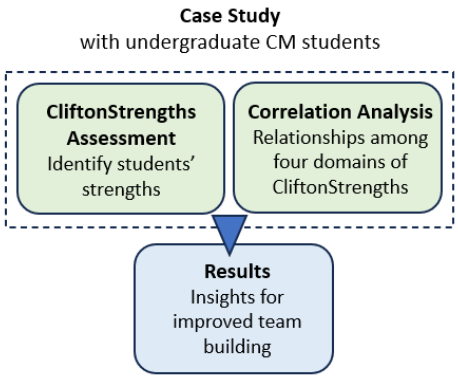

Figure 1. Methodology of the study

The CliftonStrengths assessment was implemented in the Fall and Spring semesters of 2022 and 2023 and Spring 2024 with a total of 319 undergraduate students at Purdue University School of Construction Management Technology CM 400 capstone course. The study received exempt approval from Purdue University's Institutional Review Board (IRB) prior to the implementation of the assessments. Students accessed and completed the assessment using the *Strengths Finder 2.0* book (Rath, 2007). The assessment consists of 177 questions and takes approximately 30 to 45 minutes to complete. Students responded to pairs of statements, selecting their natural preference where there were no right or wrong answers with a timer to encourage instinctive responses. Upon completion, students received a report detailing their top five strengths. Students uploaded the results of their assessments to the course learning management system as part of the data collection. As teams, students consolidated, reviewed, and discussed their collective strengths while also reflecting on how to leverage their individual strengths and promote those of their teammates. After processing this information, the class had the opportunity to review the most and least common strengths among their

peers. It is important to highlight that the data collected from the assessments contributed to one of the course objectives: *enhancing teamwork within groups with diverse skill sets*.

Following data collection, the frequency of the top five strengths among the participating students was identified utilizing Microsoft Excel. A correlation analysis was then conducted to examine the relationships between students' identified strengths across the four domains of the CliftonStrengths assessment. The pairwise Pearson correlation was utilized in Minitab software to measure the linear relationships between paired variables of domains. The correlation coefficients indicate the strength of the relationship between each pair of domains, while the p-values assess the statistical significance of these relationships (Ott et al., 2010). This method is particularly effective for assessing correlations in psychological assessments, such as the strengths identified through the CliftonStrengths assessment (Devore, 2016). Moreover, it examines the relationships between each pair of variables independently, allowing for a more detailed analysis of the connections between specific strengths in different domains, which aligns with the study's purpose.

Results and Discussion

Descriptive Analysis Results

The results provided valuable insights about students' strengths and the domain relation, which has the potential to support team building and personal development. The distribution of 34 strengths among participating students provides a diverse range of abilities, as presented in Table 2. *Relator* was the most frequently identified strength at 6.6%, followed by *Restorative* at 6.1%, *Achiever* at 5.4%, *Futuristic* (5.0%), and *Competition* (4.9%), indicating a focus on interpersonal relationships, forward-thinking, and reliability. *Connectedness* appeared as the least common strength at 0.7%, suggesting a potential area for development in fostering a sense of belonging within teamwork. The varied distribution of strengths in Table 2 reflects a broad range of capabilities among participating students, emphasizing the importance of understanding and leveraging these diverse strengths in collaborative settings for enhanced team performance.

Table 2. Strengths distribution of participating students

Strength	Count	Percentage
Relator	105	6.6%
Restorative	97	6.1%
Achiever	86	5.4%
Futuristic	79	5.0%
Competition	78	4.9%
Responsibility	77	4.8%
Adaptability	75	4.7%
Analytical	72	4.5%
Harmony	72	4.5%
Deliberative	58	3.6%
Consistency	56	3.5%
Strategic	51	3.2%
Individualization	48	3.0%
Focus	46	2.9%
Context	45	2.8%
Arranger	43	2.7%
Includer	42	2.6%
Discipline	40	2.5%

Significance	40	2.5%
Communication	39	2.4%
Developer	36	2.3%
Positivity	35	2.2%
Belief	30	1.9%
Empathy	29	1.8%
Ideation	28	1.8%
Command	26	1.6%
Input	26	1.6%
Woo	26	1.6%
Learner	25	1.6%
Maximizer	21	1.3%
Activator	20	1.3%
Intellection	17	1.1%
Self-Assurance	14	0.9%
Connectedness	11	0.7%
	1595	100%

Strengths were grouped according to the defined domains by Gallup (2024b), and their distribution among students across the four domains revealed some trends in capability alignment. *Executing* domain emerges as the largest category, accounting for 33.46% of strengths. Based on Gallup (2024b) this domain highlights a strong emphasis on individuals who prioritize action and effectiveness in task implementation to achieve results. *Relationship Building* was the second domain, with 28.44%, indicating a substantial focus on interpersonal skills and the ability to foster collaboration among peers as per its definition. The *Strategic Thinking* domain accounts for 21.53%. This domain suggests that analytical and forward-thinking approaches also hold considerable value among students. Lastly, the *Influencing* domain comprises 15.32%, which reflects a relatively lower presence of strengths related to persuasion and leadership. Based on the higher percentage and the domain definition of *Executing*, the results can be interpreted that participating students tend to make things happen, which aligns with the hands-on and practical perspective of construction management education. The second higher percentage in *Relationship Building* is promising to consider the teamwork environment and collaborative nature of the construction industry. Moreover, the following categories of *Strategic Thinking* and *Influencing* align with students' limited experience in the construction industry. These strengths are typically expected to be developed over the years with experience and expertise.

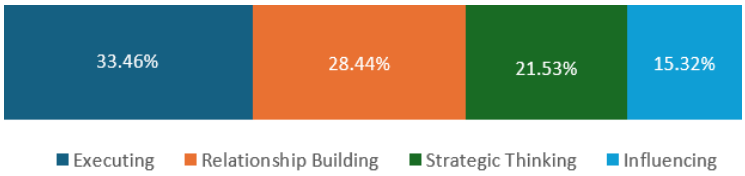

Figure 2. Strengths distribution in four domains

Correlation Analysis Results

Correlation analysis is a statistical method used to measure the association or relationship between two or more quantitative variables based on the assumption of a linear relationship between them. It enables researchers to assess the strength and direction of any potential associations (Gogtay & Thatte, 2017). In this study, correlation analysis was supported to examine the relationships between

the CliftonStrengths domains of the participating students, demonstrating the potential of using the assessment for team building.

Correlation analysis is commonly used in behavioral and social sciences, education, and business (Cohen et al., 2015). To perform the analysis, this study utilized pairwise Pearson Correlation to evaluate the strength and direction of relationships among the four CliftonStrengths domains. This method is particularly effective for assessments, such as those obtained from the CliftonStrengths tool (Devore, 2016). The correlation coefficients (r-value) reveal the degree and direction of these relationships. Table 3 presents the guidelines used to classify correlations as very weak (0.00–0.19), weak (0.20–0.39), moderate (0.40–0.59), strong (0.60–0.79), and very strong (0.80–1.00). In addition, positive r values represent a positive correlation, reflecting that when one variable increases, the other one increases as well. On the other hand, the negative ones indicate that when one variable decreases, the other variable increases; this does not necessarily imply that individuals cannot possess a specific strength from a specific domain, only that such strengths and/or domains are not among the top 5 assessments.

Table 3. Interpretation of Correlation coefficient (r-value)

Correlation Coefficient Value (r)	Interpretation
0.00 – 0.19	Very Weak (or negligible)
0.20 – 0.39	Weak
0.40 – 0.59	Moderate
0.60 – 0.79	Strong
0.80 – 1.00	Very Strong

Table 4 presents the correlation values among the four CliftonStrengths domains obtained from the study. The correlation analysis revealed several relationships between the CliftonStrengths domains measured in the participating group of students.

Table 4. Pairwise Correlation matrix of CliftonStrengths domains (r-value)

	Executing	Influencing	Relationship Building	Strategic Thinking
Executing	1			
Influencing	-0.431	1		
Relationship Building	-0.267	-0.253	1	
Strategic Thinking	-0.352	-0.152	-0.410	1

A moderate negative correlation was observed between *Influencing* and *Executing* (r = -0.431) domains, suggesting that the influencing strengths may inversely relate to those of executing tasks. This finding may suggest that students who are better at motivating and supporting others may not focus on task-oriented implementation. The *Relationship Building* domain showed weaker, yet significant, negative correlations with both the *Executing* (r = -0.267) domain and the *Influencing* (r = -0.253) domain, reflecting individuals who tend to foster relationships and collaboration may be less likely to prioritize execution. This inverse relationship highlights a potential trade-off, where strengths in interpersonal connection might come at the expense of strengths in task-driven activities. *Strategic Thinking* and *Executing* have a moderate negative correlation (r = -0.352), which may indicate that students with analytical and forward-thinking strategies may place less emphasis on immediate task completion, reflecting a potential divergence between planning and action-oriented tendencies. The negligible correlation between *Strategic Thinking* and *Influencing* (r = -0.152) suggests that strategic analysis and planning strengths have little to no association with leadership-related behaviors. This

may indicate that individuals can show high levels of one domain without it significantly affecting the other. The moderate negative correlation between *Strategic Thinking* and *Relationship Building* (r = -0.410) may suggest a more inverse relationship, where students who are strong in analytical and strategic approaches may be less inclined toward interpersonal and collaborative strengths. These correlations provide insights into how different strength domains interact with each other, highlighting areas where particular strengths may inversely relate to others. Moreover, Table 5 presents the confidence intervals and p-values or the correlation analysis indicating the relationships' statistical significance.

Table 5. Domains and their statistical significance

CliftonStrengths Domains		r value	95% CI	p-value
Influencing	Executing	-0.431	[-0.529, -0.322]	0.000
Relationship Building	Executing	-0.267	[-0.381, -0.145]	0.000
Strategic Thinking	Executing	-0.352	[-0.458, -0.236]	0.000
Relationship Building	Influencing	-0.253	[-0.368, -0.130]	0.000
Strategic Thinking	Influencing	-0.152	[-0.274, -0.025]	0.019
Strategic Thinking	Relationship Building	-0.410	[-0.510, -0.298]	0.000

The confidence intervals (CIs) and p-values provide important insights into the statistical significance of the correlation analysis in this study. The CIs represent the range within which the correlation coefficient is likely to fall, with narrower intervals indicating more precise estimates. For example, the *Influencing* and *Executing* domains have a correlation coefficient of -0.431, with a CI of [-0.529, -0.322], suggesting a moderate inverse relationship and a high level of precision in the estimate. Similarly, the p-values for all correlations are statistically significant ($p < 0.05$), with values as low as 0.000 for most relationships, indicating that the observed correlations are highly unlikely to have occurred by chance. These low p-values reinforce the reliability of the correlations, while the CIs offer further assurance that the relationships are consistent and robust across the sample. In contrast, the correlation between *Strategic Thinking* and *Influencing* is weaker (r = -0.152) and has a p-value of 0.019, which, while still significant, suggests that the relationship is less pronounced compared to the other domains.

Conclusion

This study aims to identify the critical strengths of undergraduate students in a construction management capstone course with the CliftonStrengths assessment, where students' strengths were incorporated into team-building efforts as part of the course. Additionally, the study examines the relationships among the assessment's four domains, *Executing, Influencing, Relationship Building,* and *Strategic Thinking*, within the student cohort utilizing a correlation analysis. Overall, the results indicate significant negative correlations between the domains, with varying degrees of strength. These findings suggest that certain strengths may inversely relate to others, providing valuable insights into how different strength domains interact within the student cohort. This information can inform personal development, team building, and career progression strategies, leveraging students' diverse strengths to enhance overall performance.

On the other hand, the observed negative correlations primarily reflect the structural limitation of having only five top strengths. Individuals may focus on developing and recognizing strengths within specific categories, leading to trade-offs in others. While the correlations demonstrate relationships between different strengths, interpreting them requires understanding this limitation. The strength of one area often comes at the expense of another, emphasizing the need for a more nuanced understanding of students' strengths beyond binary comparisons. Inverse correlations between

domains show the importance of balancing the students' strengths to address gaps. For example, a student who is strong in Strategic Thinking but weaker in Executing might excel in long-term planning but could benefit from working with another student who is stronger in Executing with more task-oriented skills to translate plans into actionable outcomes. Faculty advisors or career coaches can guide such students to take on roles and collaborate in their projects.

While this study provides valuable insights, it is important to acknowledge several limitations that may broadly affect the practical applications of the findings. First, the CliftonStrengths assessment, although widely recognized, may not fully capture the range of strengths specifically relevant to construction management students. The assessment only identifies each student's top five strengths without providing information on the relative strength or emphasis within these top five strengths. Additionally, the sample is limited to undergraduate students from a single university, which may not be representative of the broader population of construction management, thus limiting the exploration of potential regional impacts. Future studies could address these limitations by extending the study to multiple institutions across geographically diverse locations and utilizing other tools to determine a wide range of strengths. Moreover, longitudinal studies tracking the same group of students throughout their early and mid-career stages would reflect the progression of their strengths over time and with experience. Finally, a comparison of the strengths of industry professionals to students entering the industry would provide a deeper understanding of how strengths develop in the transition from academia to industry.

Overall, this study demonstrates the potential of the CliftonStrengths assessment as a valuable tool for identifying and utilizing students' strengths to improve team building in construction management education. As one of the few studies, it offers a structured approach to fostering teamwork in their classrooms, aligning with practices in the construction industry. Furthermore, the study provides an influence of promising research efforts at better understanding and integrating the strengths of construction professionals beginning at the educational level. This can support efforts in organizational management and recruitment and retention of a diverse workforce.

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