

# Construction Management Student Observations of Communication in the Construction Industry

Mitchell L. Shaw, BS and Kenneth T. Sullivan, PhD, MBA  
Arizona State University  
Tempe, Arizona

In the construction industry, it is the people that make a project successful. In order to accomplish this, effective communication is the key. This paper analyzes communication methods experienced by construction management students during an internship and/or full-time employment. There has been a great deal of research from the viewpoint of professional constructors; however little research has focused on communication methods from the student's perspective. The current demographics of the construction industry have a wide variety of ages. This paper focuses on the college student, which are the construction industries newest participants. This paper looks at the methods, effectiveness, topics, participant distribution, and supervisor's ability to communicate. As younger participants begin to enter the workforce, it is vital to understand how to communicate effectively to reach a common goal.

**Key Words:** Communication, Student, Construction, Management, Observation

## Introduction

Communication is often regarded as one of the most important factors of project success. A study conducted by Yu *et al.* (2006) found that 35.7% of respondents surveyed ranked open and effective communication as the most important critical project success factor (p.1184). It has also been established that the achievement of a project's goals is highly dependent upon the construction management team's capability to communicate effectively (Shohet & Frydman, 2003). And within construction projects, "during certain stages, some phases may very often be undertaken simultaneously, requiring major efforts in terms of the coordination and communication between participants" (Shohet & Frydman, 2003, p.570). These and other past studies consistently verify that the ability to communicate effectively is a necessary skill for one to become a successful construction manager.

This is why it is important to analyze communication with the millennials entering the workforce. "Millennials (born 1980-2000) have only recently entered the full-time workforce and many unanswered questions remain about this group" (Real *et al.* 2010, p.304). Communication in construction is easy in theory, but can be difficult in reality. This is significant because communication is a key component to a successful construction project that for many is a skill developed over time. This paper analyzes communication as experienced by entry-level construction management students during their internships or limited full-time professional experience and compares the findings to those found in previous research of more experienced industry participants.

## Literature Review

The importance of and approach to effective communication is well researched in the literature. Shohet and Frydman (2003) said communications between the construction manager and the design team were found to be vital in ensuring adherence to project objectives (p.570). Odusami (2002) found contractors ranked communication as the most important skill of an effective project leader (p.61). Chinowsky *et al.* (2011) said the understanding of communication and knowledge exchange elements within a given project network, provides the capacity to identify coordination misalignment between organizations on the project and their interdependent task assignments (p.171). Yu *et al.* (2006) said designers speak different languages to users, yet they must understand the business language of

their clients to allow for meaningful communication of needs (p.1179). Indeed communication may be practiced with different members, using different tools and techniques. Cheung *et al.* (2013) said there are a number of communication methods such as face-to-face meetings, fax, email, and telephone that can be used in the construction industry (p.943).

It is important to discover how students perceive the effectiveness of these methods, and how they are related, in order to ensure success. Chang and Shen (2013) said coordination quality refers to the perceived utility of a method and the clarity of communication between participants using the method (p.2). Noting that “clarity of communication is the degree to which all involved parties understand the information being transmitted by the coordination method” (Chang & Shen, 2013, p.3). The benefit of this is to shed light on the perspective of the student. Real *et al.* (2010) said although millennials do not need preferential treatment, it is important that organizations understand that strategic approaches to working with this generation will likely result in improved outcomes (p.312).

## Methodology

From the literature, a survey consisting of ten questions, taken from past research of communication amongst construction professionals, was developed to quantify communication methods and effectiveness as perceived by college students in the construction industry. The survey was distributed to students in sophomore, junior, senior, and graduate level courses. The students were asked their age, year in school, their construction experience, construction sectors worked, methods used to communicate, effectiveness of communication topics, amount of communication with project members, and their supervisor’s communication effectiveness. In the school of construction management, there is a wide range of ages. It was the author’s objective to compare how age, with respect to communication, measured against the literature review, particularly the studies of Shohet and Frydman (2003).

The authors of this paper surveyed freshmen through graduate students, and were recorded as 1 through 5. This allowed for a diverse perspective, while meeting the goal of opinions from entry-level participants in the construction industry. As with age, there is a wide range of experience in the school of construction management. It was the author’s objective to capture the experiences of the students based on time in the industry. This was done by separating internship experience and full-time experience. The internship choices were none, 1-3 months, 4-6 months, 7-12 months, and 12+ months, and were recorded as 1 through 5 accordingly. The full-time choices were none, 1-6 months, 7-12 months, 1-2 years, 3-5 years, and 5+ years, and were recorded as 1 through 6. In the next question was construction sectors worked. The sectors were industrial, commercial, heavy civil, residential, and other. In the next question, the authors wanted to find the students’ methods of communication used and their effectiveness. To determine the methods used, the students were asked to assign a percentage to verbal (face-to-face), drawings/letters/specs, telephone/teleconference/videoconference, and email/texting/social media equaling 100% (Shohet & Frydman, 2003). To determine the methods effectiveness the students were asked to rate the aforementioned methods on a Likert scale from 1-9.

In the next question, students were asked to break down the topics of communication and their effectiveness. The students were asked to assign a percentage to topics such as instructions, materials and equipment, quality management, allocation of manpower, and cost control equaling 100% (Shohet & Frydman, 2003). To determine the topics effectiveness the students were asked to rate the aforementioned topics on a Likert scale from 1-9. Next, students were asked to rate the amount communicated with project participants. The students were asked to assign a percentage to project participants such as owner(s), designer(s), project engineer(s), subcontractor(s), superintendent(s), and supplier(s) equaling 100% (Shohet & Frydman, 2003).

In the final question, students were asked to rate their supervisor’s communication effectiveness in completing their assignments. The students were asked to rate their supervisor’s technical know-how, reasonableness, kindness, professionalism, clarity, and responsiveness on a Likert scale from 1-9. The data from the survey was entered into an Excel spreadsheet, and descriptive statistics performed. The results were compared to the literature review and to each other based on interesting findings.

## Results

The data analysis focused on mean age, response rates, email/texting/social media vs. verbal (face-to-face), age vs. email/texting/social media, communication methods of professionals vs. students, communication topics of professionals vs. students, and the students' supervisor's communication effectiveness. The mean age of the students surveyed is 24.4 years, with internship experience of approximately 3-4 months, full-time experience of approximately 6-7 months, and between a Junior or Senior as shown in Table 1. Of the 93 students surveyed, 58 students answered the survey completely or correctly. This produced a response rate of 62.4%.

**Table 1. Sample Data**

	<b>Age</b>	<b>Internship Experience</b>	<b>Full-time Experience</b>	<b>Year in School</b>
Mean	24.4	2.9	2.6	3.6

After comparing the communication method data (Table 2), the results showed that as a percentage of their total communications, professionals used verbal (face-to-face) communication methods 14.9% less frequently, written communication 13.7% more frequently, and verbal communication by electronic means 1.2% more frequently than students. Next the authors compared communication topics (Table 3) between professionals and students. The results showed that professionals spent 1.6% less time on instructions, 10.0% less time on materials and equipment, 4.0% less time on quality management, 17.0% more time on allocation of manpower, and 1.3% less time on cost control than students. Finally the authors compared the amount of communication with project members (Table 4). The results showed that professionals communicate with owner(s) 6.9% more frequently, 7.9% more with designer(s), 3.8% less with project engineers, 1.8% less with subcontractor(s), 3.9% less with superintendent(s), and 5.2% less frequently with suppliers than students.

**Table 2. Comparison of Professionals and Students Methods of Communication Used**

<b>Communication Method</b>	<b>Professionals (from past literature)</b>	<b>Students (from current survey)</b>
Verbal (face-to-face)	28.0%	42.9%
Written Communication	52.0%	38.3%
Elec. Verbal Communication	20.0%	18.8%

**Table 3. Comparison of Professionals and Students Topics of Communication Used**

<b>Communication Topics</b>	<b>Professionals (from past literature)</b>	<b>Students (from current survey)</b>
Instructions	30.0%	31.6%
Materials and Equipment	11.0%	21.0%
Quality Management	13.0%	17.0%
Allocation of Manpower	30.0%	13.0%
Cost Control	16.0%	17.3%

**Table 4. Comparison of Professionals and Students Parties Communicated With**

<b>Communicating Parties</b>	<b>Professionals (from past literature)</b>	<b>Students (from current survey)</b>
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Owner(s)	23.0%	16.1%
Designer(s)	22.0%	14.1%
Project Engineer(s)	18.0%	21.8%
Subcontractor(s)	16.0%	17.8%
Superintendent(s)	15.0%	18.9%
Supplier(s)	6.0%	11.2%

Tables 5 and 6 show the students average responses when asked to rate the effectiveness of different forms of communication. In Table 5 the students identify verbal (face-to-face) as the most effective method of communication.

**Table 5. Students Ratings of Communication Method Effectiveness (1-9 scale, 9=extremely effective)**

	<b>Verbal (face-to-face)</b>	<b>Drawings/ Letters/ Specs</b>	<b>Telephone/ Teleconference/ Videoconference</b>	<b>Email/ Texting/ Social Media</b>
Mean	8.2	6.3	6.5	6.6

**Table 6. Students Ratings of Topical Communication Effectiveness (1-9 scale, 9=extremely effective)**

	<b>Instructions</b>	<b>Material and Equipment</b>	<b>Quality Management</b>	<b>Allocation of Manpower</b>	<b>Cost Control</b>
Mean	7.5	6.8	6.7	6.3	6.6

t-Tests were also performed comparing the effectiveness, from the student's perspective, of the various factors, particularly the effectiveness of email/texting/social media vs. verbal (face-to-face) communication. The average student rated effectiveness of email/texting/social media (Table 5) was a value of 6.6/9 and for verbal (face-to-face) was 8.2/9. Using an alpha value of 0.5, the t-test resulted in a df-value of 114 and a p-value of 0.000. This shows a statistically significant difference between the two methods. The other t-Test performed compared age vs. the use of email/texting/social media to communicate. Using an alpha value of 0.5, the t-test resulted in a df-value of 114 and a p-value of 0.000. This shows a statistically significant difference between the two.

## Discussion

This paper showed how students communicated during employment in the construction industry. The authors found it interesting that millennial students used face-to-face communication significantly more than did professionals, with the students also responding that email/texting/social media was less effective than verbal (face-to-face). It is common to assume that millennials prefer electronic forms of communication over verbal, but the collected data from this study shows that, at least for project specific purposes, students find face-to-face communication more effective and use it more frequently. For the difference in amount of verbal (face-to-face) communication between students and professionals, this may be due to the nature of the student's professional experience, with it being more hands-on training or job shadowing, thus requiring a large amount of verbal interaction. The authors also found it interesting that within the student population, there was no correlation between age vs. email/texting/social media. This may be due to the commonness of these forms of communication amongst all ages so that age is no longer a discriminating factor.

The comparison of professionals (past literature) and students (current survey) electronic verbal communication (Table 2) is negligible. The authors propose that professionals and students communicate equally with each other. The comparison of professionals (past literature) and students (current survey) communication involving instructions (Table 3) is negligible. The authors propose that professionals give instructions to students, resulting in similar data. The authors propose that students spend more time on materials and equipment due to it being an entry-level management item, thus accounting for that difference between the groups. For the same reason, the authors propose that students spend more time on quality management. Also, professionals spend more time on allocation of manpower because they decide who does what, and when. The results the authors found concerning cost control were negligible. This could be due to different levels of employees working on separate aspects of cost control.

Finally, as would be expected, professionals communicate more with owners and designers because students would not commonly be a part of these higher level discussions. Consistent with the nature of most internships, students communicate most frequently with project engineers, subcontractors, superintendents, and suppliers because the majority of entry-level positions entail discussions of the design and specifications, how to construct, and the materials needed. It may be of value for future internship programs to seek opportunities for students to more regularly have the opportunity to observe higher level interactions of managers, especially involving owners and other major project stakeholders.

## Conclusion

Due to the construction industry being fast-paced and high-tech, it makes communication that much more important. As much of the available past research has focused on communication in construction from the professional's viewpoint, this paper sought to consider a construction management student's viewpoint. After conducting a survey based on the literature review, the authors found that students used more traditional methods to communicate rather than current technology. The major finding was that students communicated verbally (face-to-face) more than professionals. This is surprising because of the commonly held belief that millennials use technology more than older generations. Areas of future research may include how college students use technology to communicate with each other vs. older professionals. Another area would be, when in a learning environment, is verbal (face-to-face) more beneficial to learning rather than using technology? Based on Tables 2 through 4, it is interesting that students discussed instructions verbally (face-to-face) with subcontractors. This can be a future area of focus to educators to prepare students to communicate effectively with subcontractors.

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