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A Project Called 10Q Easily Adaptable to Any Course

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Introduction

To be successful, civil engineering students need both technical competencies and professional skills, such as the ability to communicate clearly, social aptitude, business acumen, ethical awareness, and an openness to others' perspectives and ideas. As courses focused on technical content leave little room to spare, much development of such professional skills is outside the capacity of the traditional curriculum.

A teaching technique to enhance student engagement and learning was attempted in civil engineering courses at Mississippi State University periodically through a period of several years. The activity is called Ten Questions (10Q). In 10Q, students interviewed professionals who work in a civil engineering field most relevant to the course subject. Students made contact with an individual of choice. Introductions from faculty were sometimes necessary, but many students selected someone from where they previously had a co/op or internship. Most of the interviewees are alumni with workplaces throughout the state of Mississippi, though professionals from prominent firms elsewhere in the country were also agreeable. To conduct the private interviews, especially more recently, students were encouraged to use Webex or equivalent, the apps which gained such popularity during the pandemic. The first seven of the ten questions were established in advance by class consensus and asked in all interviews, while the final three questions were each student's choice. These additional questions frequently came to students as the conversation unfolded and were not always according to plan. Interviewees dependably provided adequate responses, and some elaborated quite extensively. The interviews were not typically recorded. Students gently edited and condensed the responses as they prepared transcripts to share with the rest of the class.

In the constantly changing civil engineering landscape, a contemporary viewpoint can help students tremendously. Students appreciated the unique opportunity to speak with an expert in the field. And the interviewees enjoyed the chance to

reconnect with the university and visit with a student who would soon join the workforce. This project was a meaningful complement to the normal series of lectures and assignments that are typically heavy with tedious calculations. The concept of student interviews of professionals is amenable to any course and does not require resources not already available. 10Q may be particularly useful to universities in small towns where field trips and guest lectures are inconvenient. (The college town of Starkville, the home of MSU, is a drive of two hours to the nearest cities.) 10Q is intended to be an individual activity, although teamwork is sensible with large class sizes. The 10Q project aligns with several ABET student outcomes.

While 10Q has many positive qualities, it is not the perfect class activity, and this article discusses potential difficulties and best practices.

Research Objectives

The motive of these early attempts at 10Q was strictly to determine if the project is viable. How common are projects like 10Q? Could we find enough professionals who were willing to help? What complexities and issues would we confront? What exactly would students learn from 10Q? Does the value of 10Q exceed the time and effort necessary to successfully execute the project?

Others' Experience with Interviews

While an interview project to engage learners may be unusual, the idea to connect with professionals outside of the university is not new. In most cases though, university researchers have conducted the interviews and shared the content with students. Rarely have students conducted the interviews themselves.

On one project, a select group of highly successful American innovators were asked to share thoughts and experiences, and the recordings were turned into transcripts.[1] The main objective of the interviews was to develop educational strategies to promote and nurture entrepreneurship, so discoveries and novel solutions might generate economic results. In a second case, researchers conducted interviews with civil engineering practitioners in the Pacific Northwest.[2] The participants had a range

of educational levels, years of experience, employers, and responsibilities. The interview protocol included a set of main questions, but additional questions were sometimes necessary to get participants to reveal details or provide explanations. Themes began to emerge on what it takes to be successful. In a third case, university researchers in New York City conducted interviews with sports management professionals to give students realistic interpretations of various careers and previews of the work world that exists today.[3] The prerecorded interviews were put on a YouTube channel where students could consume the content on demand.

At the University of Wisconsin, Madison, first year engineering students interviewed professional engineers as part of a technical communications course.[4] Students were free to choose an interview subject or were assigned one. The one on one interviews were conducted in person or online, and both methods were equally beneficial. Students generally found the interviews straightforward and easy to do. The article did not state what questions were asked, how many, and who conceived them. Interview transcripts were shared with the class and students were asked to select a few to read. In class, the students were asked to identify common themes. Students were also required to compose individual essays to contemplate the experience. From a survey, students overwhelmingly enjoyed the interviews. The project was an excellent opportunity to learn about pathways to careers.

Unaware of these efforts at the time, the 10Q project was inadvertently developed independently. While not all aspects of 10Q are original, the experience described here builds on these records.

Project Instructions

The 10Q project was executed at Mississippi State University in three undergraduate civil engineering courses, namely Steel Structures in 2012, Concrete Structures in 2015, and Wood Structures in 2020. (Steel Structures students in 2025 may also participate in 10Q.) In the author's courses, rotational use of several different projects relegated 10Q to such infrequency. The 10Q implementations were essentially identical with only a few tweaks made. All students were civil engineering seniors. Class sizes ranged from approximately ten to thirty. Nearly all students were

traditional college age, and the male to female ratio in the classes was about three to one.

In 10Q, each student was asked to identify someone who works in the broad concrete/steel/wood structures design, construction, and maintenance fields, and they were provided with suggestions. Most likely, the interviewees had at least one civil engineering degree, a professional license, and at least five years of experience. Students were asked to make polite contact with the individual of choice, introduce themselves, and explain the project. If the person was agreeable, an interview date was set. No professional was interviewed more than once in the same term.

A majority of the respondents worked as consultants. Federal and state government employees, particularly those from the U.S. Army Corps of Engineers and the Mississippi Department of Transportation, were reliable interview subjects. Faculty members were off limits because students are around them enough already. Many of the interviewees are alumni, but by no means all. Most of the students, being seniors, have had internships and co/ops in state and around the Southeast, and they typically reached out to someone at these workplaces. The author's acquaintances from professional society and conference activities, and a few of his past students in Oklahoma and New York provided adventurous possibilities. New faculty yet to build a sufficient network may need to make new professional acquaintances, and 10Q is an innocuous way to do so.

Interviewees were generally not provided the questions in advance. Live interviews were required as these were thought to stimulate the most authentic and unguarded remarks.

The interviews were conducted in a way that was most convenient and effective. Microsoft Teams was a common choice, as was a smartphone call. Only a few interviews were face to face because of excessive travel distance. Interviews could be as short as ten minutes, but twenty to thirty minutes was more typical, and some interviews reportedly ran past sixty minutes. A few cheery respondents, oblivious of time, got lost in the conversation, but students had no complaints. One aspect of effective communication is the ability to listen, which is perceived as a sign of respect.

In the interest of brevity and clarity, students were asked to thoughtfully edit the responses. Interviewees were made aware that a transcript of conversation highlights would be shared with the rest of the students in class. Any identifying information, mainly student and interviewee names, were excluded from the transcripts. Each transcript was limited to 500 words, a word count that included the questions.

Plain, old etiquette is not going out of style, and each student was required to send the interviewee a card by postal mail to sincerely thank them.[5] Universities could hardly exist without the loyalty and generous support of alumni and friends. Several of the interviewees have even been repeat participants. Serendipitously, student interviewers have become job interviewees, and job offers have been made.

Interview transcripts were put into a depository like Dropbox or Google Drive and made available to the class. Students were required to read all transcripts and compose reflections in approximately 500 words to describe the most remarkable points, common themes, and what they learned unexpectedly. To conclude, one class period of 50 minutes was allocated to discuss the whole experience and establish key takeaways.

Seven Questions Plus Three

The main purpose of the ten questions was to explore various aspects of civil engineering practice, the preparations necessary to become a professional, and the challenges of the job. Of course, in the process of gathering these responses, students also improved professional skills.

Ten questions were thought to be the right amount, not too many as to become overwhelming to everyone, but enough to make the interview worthwhile. The first seven questions were decided by class consensus. Each student was asked to prepare three additional questions ahead of the interview, but impromptu questions were acceptable depending on how the interview was going.

Before an interview began, students attempted to establish a measure of rapport through friendly chat. Small talk can be useful to realize common ground, a launchpad to more profound conversations.[6] An interviewee at ease is more likely to be in a talkative mood. To build momentum, the first question was the simplest.

The strategy was to keep the questions fairly open to allow the subject the freedom to go where they wanted to go, more like a prompt that an investigative inquiry. A question focused too narrowly could elicit a relatively terse reply. An unprovocative question could invite a courteous but predictable reply. Students were to explore a variety of topics and not go down a path of redundancy to beat a single topic to death. Each question was to distinctly add value to the interview. Students avoided questions of an unduly personal or confidential nature. Students were cautioned to tread lightly on controversial subjects. Interviewees could pass on any of the questions.

Though not always possible to place precisely into categories, the questions addressed education, job expectations and perks, project challenges and successes, future directions, ethics, and general advice. Questions sometimes crossed the boundaries between categories. Likewise, the responses could swerve into multiple categories, stream of consciousness style.

The first seven questions common to all interviews, in most implementations of 10Q, were as follows.

1. Where do you work, how many years of experience do you have in this job, and what do you like most about your company/organization?
2. How did you get into civil engineering, what influences did you have, and where did you go to college?
3. What was the most positive experience you had as an undergraduate, what was the greatest challenge you had to face in college, and which three courses proved to be the most useful to you?
4. What advice can you give me as I complete my civil engineering degree and start my career?

5. What has been your greatest accomplishment on the job, and also the greatest challenge you have had to face professionally?
6. What ethical issue could you confront on the job, and how would you respond?
7. What does the future of civil engineering look like to you, and what revolutionary changes do you think will come within the next twenty years?
8. Open
9. Open
10. Open

A sample of questions contrived by the students were as follows.

- In college, when did you discern what you like and dislike among the civil engineering specialties?
- What course do you wish you had in college but did not take, and why?
- What essential job skill did you not have when you came out of college?
- What changes should be made to undergraduate civil engineering curriculums to ready students to meet the challenges of today's workforce?
- What aspects of the job are trial by fire and impossible to teach?
- What does your company/organization value more in new hires, an applicant with a strong academic record across a broad range of courses, or someone with competency mainly in one specific area and expertise with a software app?
- As your company/organization looks to recruit, which qualities, abilities, and accomplishments are essential, and which are merely desirable?
- What was your most challenging project to date, and how did you overcome the obstacles?
- Does your firm support enrollment in an online master's degree program in civil engineering? (And by support, I mean pay a substantial amount or all of the costs, but with some conditions, obviously.)
- What is the average salary premium earned by those with a master's degree in civil engineering compared to those with a bachelor's degree only?
- Does your firm encourage active membership in a professional society such as ASCE?

- Does your firm support attendance at professional society conferences once or twice yearly to keep up with the latest developments in the field?
- What is the status of the economy relative to concrete/steel/wood structures, and what are common obstacles to business success?
- How could I use my entrepreneurial skills at your company?
- What attributes are necessary to be successful at your company/organization, and to eventually get into leadership positions?
- How many times can civil engineers expect to change jobs/workplaces throughout careers?
- Did you make any early mistakes on the job and, if so, how did you rebound? Since failure is considered part of the process and an opportunity to learn, do you have a story to share?
- If there are numerous solutions to a problem, which one do you pick? Does the lowest cost alternative always win?
- In civil engineering work, can we meet sustainability objectives and still produce the highest quality infrastructure and be profitable?
- What is your schedule like on a typical day? Do you have a steady routine or is each day completely random?
- What do you love every day when you go to work? What are the least favorite aspects of the job?
- What productivity improvements will come to the civil engineering workplace in the years ahead, and is such efficiency always desirable?
- Which civil engineering tasks will go the way of AI?
- What are the pluses and minuses of concrete/steel/wood as a structural material?
- What new materials will be used to build the infrastructure in the foreseeable future?
- While catastrophic structural collapses are extremely rare, what are the greatest risks?

Project Outcomes

After the project, students were asked to evaluate 10Q on a brief survey, which all did. A majority “strongly agree” or “agree” that the project was “a good challenge

and added value to the course," and also "increased my interest in civil engineering and motivated me to learn more." (The five survey choices were "strongly agree," "agree," "neutral," "disagree," and "strongly disagree.") A summary of the courses and share of positive responses ("strongly agree" or "agree") are reported in Table 1 below.

Table 1. Summary of Student Survey Results

Course	Term	Undergraduate Enrollment	Good Challenge and Added Value	Increased Interest and Motivation
Steel Structures	Fall 2012	31	73%	77%
Concrete Structures	Fall 2015	26	85%	81%
Wood Structures	Spring 2020	11	91%	82%
Steel Structures	Fall 2025			

Class discussions about the interview transcripts, which the students were asked to read entirely, were generally very fruitful with most students avid to share observations. Even more impressive were many of the reflective essays that expounded on what students found most worthy from 10Q. In the essays, students were asked to contemplate on what they learned from the 10Q summary transcripts and what they liked and disliked about the project.

From the author's observations in class and office hours, and from review of the reflective essays, some students showed improvements in confidence and attitude. It is the author's belief that many students came away with a renewed commitment to civil engineering at a point in college, one or two semesters from graduation, when spirits can ebb. But only anecdotal evidence is available to support these claims.

With very few exceptions, the interview subjects were cooperative at every turn. The interviewees needed minimum encouragement to give adequate responses. Quite the opposite, the interviewees were known to elaborate fervently, some more succinctly than others, and delivered sound advice. There are too many precious vignettes to list here.

Perhaps the only disappointment was the question on ethics, always one of the first seven. It generally elicited bland replies and explanations of relatively trivial situations. Many respondents seemed to conflate ethics with what is strictly legal and illegal, though the most captivating ethical scenarios are found in the shades of gray between the obviously black and white. Too frequently, in the author's opinion, civil engineers fail to recognize ethical responsibilities of colossal consequence, while there is fuss about what a lunch or gift from someone might mean. A few alternative ethics questions may be more on target. What ethical issue, highly debatable and of broad import, might civil engineers such as you help shape the outcome? What ethical responsibility reverberates with you most?

From the survey, a great majority of student comments were positive. But no class activity can be without some innocuous complaints, and a few students had a less upbeat tone. What students learned from 10Q is less technical than textbook content and unfortunately considered by some as being less worthy.

Unlike many projects, 10Q does not reside in students' comfort zone. It can be stressful to contact people, especially those who you have not met, to make a request. Social interactions can create anxiety.[7] With professionals being so busy, and students amid a full load of classes, interview appointments were sometimes difficult to schedule. With large class sizes, two on one interviews, or even three on one, instead of one on one, may be more appropriate to keep the quantity of transcripts manageable. There is always a risk when going beyond the cozy confines of campus, but this project has not encountered any significant problems.

A chief benefit of the 10Q project was the development of professional skills, which are essential on the job but hardly an emphasis in a typical civil engineering curriculum. This project also gave students an idea how businesses actually work, and what competencies are prized by employers. Not all opinions were the same, and students were exposed to different perspectives.

Student achievements from the 10Q project are directly applicable to ABET Student Outcomes 3, 4, and 7, which address effective communication skills, ethical responsibilities, and continual learning strategies, respectively.[8]

As a project, 10Q counted a relatively small amount of the grade, up to 10%, though a weight as high as 20% may be appropriate in some courses. Assessment measures included the choice of the interviewee, the uniqueness and perceptiveness of the three additional questions, the content of the responses (though largely out of the students' control), the transcript quality, discussion contributions (if the class size allowed), and the reflective essay. A quiz to evaluate students individually on 10Q content may be feasible.

Summary and Conclusions

Much can be learned from simply talking to professionals in the field, and university programs probably do not use this resource enough. In this project, students individually asked ten meaningful questions to civil engineers who work in a capacity related to the course content. Seven of the questions were common to all interviews, and each student formulated the last three questions. This project takes a certain degree of fearlessness. Interviews were conducted live, and the interviewees were not informed of the questions in advance to capture the most spontaneous and sincere remarks. 10Q gave students a contemporary viewpoint to complement the normal course fare. A majority of students gave 10Q positive marks on a survey. Students received invaluable advice as found in the summary transcripts, though this content is beyond the scope of this article. Interviewees seemed genuinely happy to contribute to the class project, especially the alumni. The project is thought to be an efficient alternative to class field trips and guest lectures. 10Q is compatible with any discipline, and easy to do without cost and much time commitment from instructors. It is an astute way to develop connections with professionals, both those who live nearby and faraway. Best of all, 10Q engages students in a potentially powerful learning activity. 10Q allowed students to connect coursework to real applications and illuminated how civil engineers can make a difference in the world.

This work was initially executed purely as a class activity without research intent. University research board approval was not obtained at the time but will be in place going forward. As such, some of the results, particularly the comments from students, are unavailable to share in this article. A more comprehensive assessment of the effectiveness of 10Q may come in the years ahead, which would include a more extensive survey and analysis of the reflective essays.

References

[1] Atkins, L., Martinez Moreno, J. E., Patil, L., Andrews, K. J., Wu, M. S., Dutta, D., Hug, B., and Bresler, L., "Fostering Innovative Skills Within the Classroom: A Qualitative Analysis from Interviews with 60 Innovators," *ASEE Annual Conference Proceedings*, Seattle, WA, 2015

[2] Froehle, K., Dickman, L., Phillips, A. R., Murzi, H., and Paretti, M., "Understanding Lifelong Learning and Skills Development: Lessons Learned from Practicing Civil Engineers," *Journal of Civil Engineering Education*, ASCE, June 2022

[3] Spearman, L., "Keeping It Real: Using Interviews with Professionals as Realistic Previews of the Sports Industry," *Journal of Hospitality, Leisure, Sport, and Tourism Education*," Elsevier, Oct 2022

[4] Courter, S. S. and Anderson, K. J. B., "First Year Students as Interviewers: Uncovering What It Means to Be an Engineer," *ASEE/IEEE Frontiers in Education Conference*, San Antonio, TX, 10/2009

[5] Gee, K., "Where College Seniors Are Falling Short," *The Wall Street Journal*, 4/25/2017

[6] Falk, E., "How Small Talk Opens Up Deeper Connections," *The Wall Street Journal*, 3/15/2025

[7] Grose, T. K., "Wow the Audience," *Prism*, ASEE, 12/2012

[8] ABET EAC, Criteria for Accrediting Engineering Programs, 10/2022