

- Building Information Modeling (BIM) Applications in the Field
- Dynamic Construction Site Planning
- Construction Site Logistics Planning
- Construction Financial Management
- Prefabrication and Modularization of Façade Systems
- Development of Construction Site-Specific Safety Plan
- Construction Safety
- Reacting to Project Scope Reduction during Preconstruction Planning

These case studies, developed by faculty and industry partners, provide real-world issues that students may face in their careers. The goal of the AGC Education and Research Foundation is to create construction case studies for use in both university courses as well as in continuing professional education programs. To support this goal, the Foundation aspires to:

- Develop case studies that reflect contemporary issues faced within the industry.
- Provide support for instructors in the use of the case studies. Many instructors may have not used case studies in the classroom, or may not have expertise in best-practices related to the topic or issue, and, therefore, will likely find instructional guidance and tools helpful.

This paper provides information about how to effectively use case studies to engage construction students in the classroom, including best practices that have proven successful.

Structure of a Case Study

The Foundation case studies originate from issues faced by construction managers on a project site. Case studies can be structured in different ways. Some provide one focal point of discussion for the entire case study while others present a series of issues with opportunities for each issue to be presented and discussed. Regardless of the case study framework, common elements to outline the issues include a **summary overview** of the case study with identified learning objectives, **background** of how the issues arose, **discussion** to provide additional details on possible outcomes, and one or more **activities** for student engagement and/or to initiate classroom discussion. The case study package also includes supporting *Instructor Notes*

The **activities** contained in the case study set the stage for students to support their solutions and argue why they are the best solutions given the situation. Often thought-provoking questions are provided for the students to review and start to formulate their potential solutions.

In addition to the case study, instructors implementing the case study will have the benefit of *Instructor Notes*. These teaching notes will provide additional context and suggestions to facilitate leading the discussion. *Instructor Notes* include answers to activity questions, discussion points, a teaching plan, logistics, and potential solutions to the case study with pros and cons for each solution. This provides a complete package for a classroom discussion of the case study.

Implementing a Case Study

Implementing a case study is typically done in three parts: (1) an introduction by the instructor, (2) an initial reading assignment with activities to complete, and (3) an in-class activity and/or discussion. The expectation that students prepare prior to class is critical. It ensures that class time is not wasted in review of the written material, and more importantly, it allows students to have time to develop their own opinions on how to solve the issues presented. Assigning homework prior to class will help ensure students are well prepared for the discussion activity and holds them accountable for the reading.

The faculty must also be well-prepared for the discussion activity and must be well-versed on the details as well as the many different outcomes of the case study. *The faculty role is not to provide solutions to the issues but to moderate the discussion and empower the students to be engaged in the discussion and the process of solving the issues.* The path the students take to a solution will vary from class to class, and even the final solutions will vary, depending on how students prioritize different elements presented and interpret the context of the issues. The objective of the discussion is for the students to learn from each other and to have a voice in the determination of the

be encouraged. This interactive discussion where all solutions are challenged should lead to a logical solution of the issue presented.

To finalize the discussion, the instructor should provide a review of the class discussion and the solutions presented. The instructor can also provide their own viewpoint, which may be based on their personal experience as well as the *Instructor Notes*. In some cases, the *Instructor Notes* will include the path or solution the contractor chose to take; however, it is always good to stress that there are other and sometimes better paths to a solution, even though it was the one the contractor chose.

Even though the case study is intended to focus on student-to-student interaction, the role of the instructor is critical. Often the preparation and execution of an in-class case study may require more effort than presenting a traditional lecture. Some tips to ensure success

Example of Case Study Implementation

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The *Instructor Notes* are very helpful and provides answers for all of the questions that will be discussed with the class. Instructors may wish to modify or supplement questions in the case study based on their personal experiences. In some cases, providing the answers from the *Instructor Notes* results in a very lively discussion because often students do not agree with some of the answers. One example of this is related to the concept of promissory estoppel; in promissory estoppel, a subcontractor can be held accountable for an oral quotation in some states. Since this violates many student expectations regarding the need for a written contract, it is always an interesting discussion topic.

To conclude the class, a quick review of the outcomes for each of the issues and the lessons learned is presented on a PowerPoint slide. This overview provides an opportunity to tie what was learned back to the course topics and learning objectives. For example, if it is an estimating course, the ethics of how a construction manager works with suppliers and subcontractors during the bidding process is highlighted. The case study is versatile enough to be used in many different construction management courses including: estimating, safety, construction law, and construction site logistics.

Accessing AGC Foundation Case Study Library

Instructors can access the published case studies at <https://learning.agc.org>. Instructors who have not already set up AGC accounts they will also need to create personal passwords. Creating a new account is free-of-charge. Once the account has been created, instructors can scroll down the Case Study menu to find the desired case study. Select the desired case study and instructor notes, and they can be downloaded free-of-charge.

Conclusion

Utilizing case studies in the classroom has been shown to be an effective way to me2 0 612ETQ