

FIELD TRIPS: CONSTRUCTION CLASSROOMS WITHOUT ROOF

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Higher education embraces outside-classroom activities such as internships, community services, and site visits. These activities bring real-world experiences into classrooms and blend them with educational content and provide a rich learning environment. Construction job site visits provide students with exposure to different types of construction projects and provide the opportunity of observing construction methods, materials, components, and crews. The Building Construction Science (BCS) program at Mississippi State University program provides students with an interactive project-based learning environment in which students utilize the additional amount of class time to experiment, collaborate, and learn. Eight studios are the core courses of the BCS program and cover the main construction subject areas. Due to the nature of studio work, students are more involved in a “learning by doing” paradigm. One of the main curriculum components of studios is out-of-state field trips, which take place at every level of the program for about one week per academic year. To evaluate the effectiveness, strengths, and challenges of field trips, a quantitative research method was used to explore students’ impressions and feedback. The results indicate field trips play a significant role in students’ learning and connect their theoretical knowledge with real-world practices. Potential benefits, optimal conditions, and challenges pertaining to the construction field trips are explored and discussed to help future job site visit planning.

Keywords: Pedagogy, Site Visit, Construction, Education, Studio, Project-based Learning.

1 INTRODUCTION

Field trips done properly are supported by research to be a positive experience for students’ learning in all levels of education. Field trips are not only meant for small children; they are just as effective for university students’ learning. Field trips may take on many different forms: visiting a place nearby, traveling across the country, traveling across the world, to even staying in the classroom and having a virtual presentation. Presently, formal field trips are not common in university settings.

1.1 Importance of Field Trips

At the elementary school level, outdoor lessons (field trips as well as outdoor activities and lessons) create an environment where students can get direct, real-world experiences while deepening their knowledge by observing what they learned in class implemented (Pridane 2015). Being outdoors encourages curiosity, imagination, and the use of all their senses. As students age, the value of leaving the classroom to enhance learning does not dissipate. Based on five

college student's evaluations and reflection papers following a trip in their social studies course, field trips were concluded to be experiential learning opportunities in which students can have fun while learning something new. Teachers reported that they were worthwhile and memorable. Student comments suggested that their field trip had a "stronger impact on their learning than previous traditional educational experiences" (Djonko-Moore and Joseph 2016). Kennedy's research supported the notion that field trips have a stronger impact on student learning. She found that students were able to recall episodic memories from field trips, which in turn helped them retain more knowledge and details. Joordens described this type of memory as "a person's unique recall of a specific event" which can be triggered from senses (Kennedy 2014). Engaging students in trips helped them connect to the curriculum while exposing them to different situations and developing social skills accordingly (Kennedy 2014). A study using 100 students and 50 teachers found that the majority supported the importance of field trips at higher levels of education. Responses determined that field trips promoted leadership, discipline, and self-confidence while being an effective learning tool. Many students reported that field trips offered a "practical approach for the curriculum" and helped them "develop more interest in learning among students" (Shakil *et al.* 2011), therefore it is recommended that all educational units arrange field trips.

Traveling internationally for class field trips is not always feasible, as they require an abundance of logistics, planning, money, and time away from school. However, they do provide diverse content delivery, learning opportunities, and benefits for parents and students (Multnomah County Partnership for Education Research 2018). Because practices vary greatly around the world, offering an international field trip should be planned and executed with proper precaution.

1.2 Challenges of Field Trips

A study of eighth grade students in Jefferson County, Tennessee, Finchum (2013) concluded that even though field trips can be educational and aid in-class learning, teachers do not adequately plan these trips. Following these trips, teachers also did not reinforce the learning with follow-up activities. Resultingly, the full educational advantage of field trips is not realized. Finchum noted that it is important for destinations to provide interactive activities. Unfavorable components of the social studies field trip deduced from student comments had to do with time, distance, choice of trip, and cultural bias. Several students felt as though it was unnecessary to travel so far, and that trips closer to where they attend school was more logical (Djonko-Moore and Joseph 2016). From other research conducted on field trips, complaints included inclement weather, inability to hear, and excessively long durations. It was noted, however, the students who noted the trip was too long, were the same students who did not take part in field trip activities (Brady 1972).

1.3 Virtual Alternatives

Virtual or electronic options offer an alternative to taking a physical field trip. These would include images, videos, presentations, and live video conferences (Pereira and Gheisari 2017). They require less planning and less time away from school. Yet, they still facilitate the collaborative learning environment and stimulate learning. Students reported finding VFTs (virtual field trips) enjoyable and were comfortable with the VFT format (Robinson 2009). Because the benefits are adversely affected with a large group of students on a short site visit, this innovative option gives each student the full advantage of the trip and empowers students with physical disabilities to participate (Multnomah County Partnership for Education Research 2018).

However, students stated that these types of field trips were less beneficial than real world experiences. It is vital that VFTs are not used as a passive activity but an interactive learning opportunity. VFTs posed challenges to educational programs due to the technology requirements and the time, effort, and energy that is required to implement VFTs (Robinson 2009). Technology limitation and communication lag can affect the overall experience of these types of field trips (Multnomah County Partnership for Education Research 2018).

1.4 Construction Related Field Trips

In construction related research, Eiris and Gheisari concluded that site visits are indeed "real-world interactive learning experiences" that help students understand modern construction practices (Pereira and Gheisari 2017). Giving the students an opportunity to interact with construction professionals in a real construction environment was invaluable and not possible in the classroom setting. The Resource Education Foundation found site visits benefitted students with active learning and real site experiences reinforcing classroom material while being a special social experience for both the students and teachers (Education Foundations 2018). A study done across a building construction course in civil engineering noted the students participating in the field study benefitted from interacting with technical onsite staff and learning construction activities firsthand. Kandamby (2018) stated these engineering students were able to "develop their skills to work as a team, collect information, record them, analyze and present as a form of a presentation or report". However, because of the nature of construction sites, on-site field trips presented additional barriers. Time conflicts with other classes, large class sizes, and short site visits challenged the faculty and staff. Because of the nature of a construction site, it was difficult for all students to see and hear. With modern technological advances, BIM and Virtual Reality (VR) are the alternative future of field trips (Pereira and Gheisari 2017).

2 METHODOLOGY

This study started with a research question asking how effective the field trip is considered by Building Construction Science (BCS) students. Field trips are a major educational component of the curriculum that work effectively with other components. The studio-based structure of the BCS program enhances the instructor-student interactions and puts students in an educational environment in which they experience a first-hand encounter with instructions, cases, projects, and real-world problems. A strong relationship with their industry advisory board provides the opportunity of having professional experts in classrooms as well as creating an educational space on job sites during field trips. These are valuable educational events that place students in a new learning position other than conventional classrooms and hence can be effective. Field trips in the BCS program are traditionally held for each yearly class during the same week in a week-long trip. This main field trip is different from other local, short field trips visiting in-state job sites as they are multi-day visits planned in large cities with a diverse range of projects including heavy civil, commercial, educational buildings, healthcare, and high-rise projects. Planning such visits are a difficult and time-consuming task that needs a great deal of coordination inside and outside the University, and therefore it is important for instructors to execute them in the most optimum way. One main input for this recurring process is to analyze students' perceptions toward different aspects of previous field trips. To obtain students' opinions on strengths and challenges of their previous field trips, a quantitative research method was used. The literature of subject was reviewed, and a survey was designed. This study was administrated to junior year students in the fall 2018 semester. The main objective of the survey was to explore different aspects of field trips through the lens of students.

3 RESULTS

In the first phase of the study, twenty-seven students completed the survey. The reported average of GPA in this group was 2.90. Participants were asked to report their previous construction work experiences as an internship or Co-Op. This question was aimed to explore the distribution of work locations of students, especially with most students coming from this the Southeastern US. The average work experience in the Southeastern region was 4.6 months and 0.85 month outside the Southeastern region. In the next section students rated different aspects of their last field trip to Chicago. This trip took place in September 2018 for one week. Students traveled to Chicago from the University by bus taking about 10 hours. In this trip, students visited multiple high-rise buildings under construction in downtown Chicago. The chosen hotel was within walking distance of the jobsites visited. Students rated items using 5-level Likert scale. The percentage of each level is shown in Figures 1 and Figure 2. For sixty-three percent of students, this was their first time visiting Chicago.

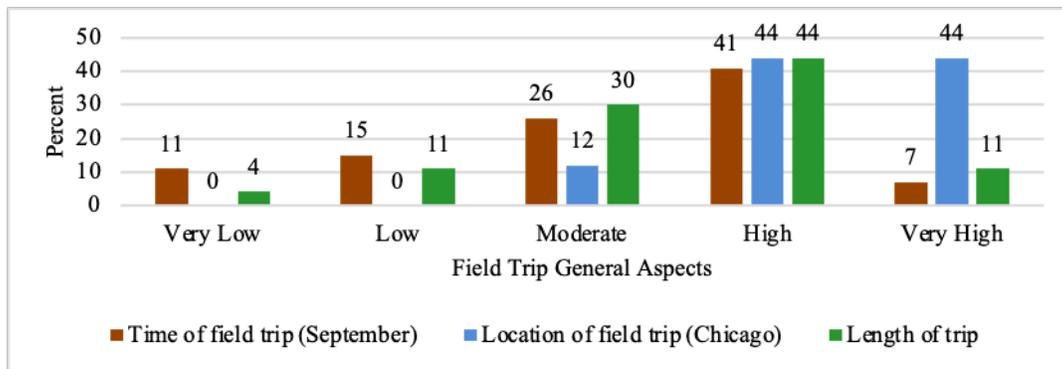


Figure 1. Percentages of quality of field trip general aspects.

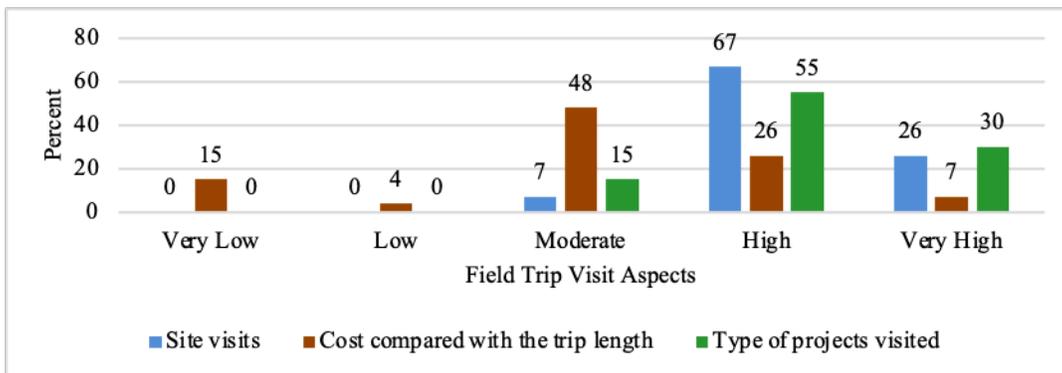


Figure 2. Percentage of quality of field trip visit aspects.

In addition, 93% of students stated that they learned something that they would not typically learn in their classes. Participants also were asked how likely they consider doing in internship or choosing their full-time job in Chicago. The percentage of each likelihood level is shown in Figure 3.

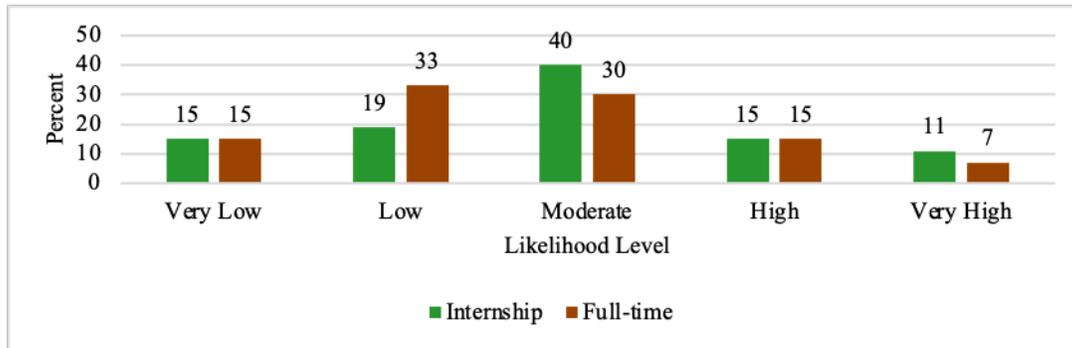


Figure 3. Likelihood of considering internship and full-time job in Chicago.

Finally, students reported their general opinion on the field trip in the BCS program. Figure 4 shows the percentage of each quality level.

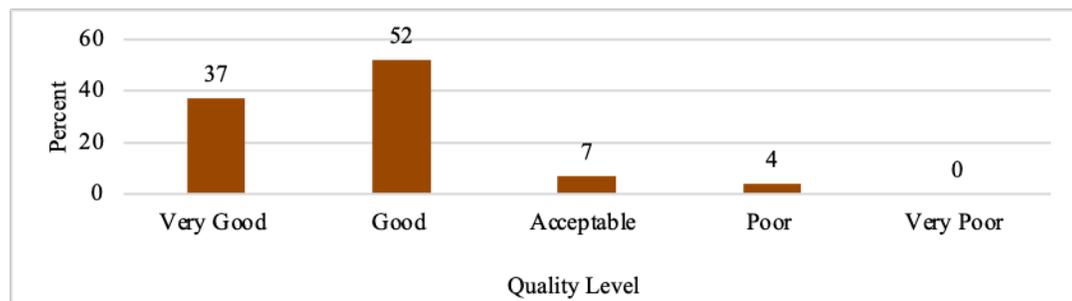


Figure 4. General acceptability of field trip.

4 DISCUSSION AND CONCLUSION

Field trips are an important educational tool that may be used in a different capacity in higher education compared to K-12. Although the content of majors in higher education has a great impact on field trip locations and their features, research has generally shown positive outcomes. Field trips put students in a different learning environment interacting with real-world situations. This generates two main benefits: first, changing the physical location of education fosters the learning process and therefore learning objectives can be achieved faster; and second, encountering real world problems and interacting with professionals motivate students in learning relevant subjects. Construction education is the area that can greatly utilize various features of field trips due to its nature. Construction programs are reportedly practicing field trips in their core courses, especially with the help of their industry advisory boards. However, these trips are typically short and take place during the working hours of one day. Planning the trips in longer visits requires a great deal of coordination and planning. There are various factors involved in planning and execution of field trips. The BCS program has traditionally embedded a one-week field trip in all levels each year in its curriculum. To have a better understanding of students' perception toward these trips, a study was designed to statistically explore common factors that impact the quality. The results of the first stage of this study are provided in this paper.

The BCS program at Mississippi State University, as a major university in the Southeastern region, extends over this geographical area, and therefore most of its students come from the same area. Hence, it is not uncommon for students to have more work experience within the

Southeastern region (4.6 months vs. 0.85 months). In this study, sixty-three percent of students reported this as their first visit to Chicago. Fifty-two percent of students (moderate-very high) stated they would consider finding a full-time job in Chicago. This number is 66% for those considering an internship in Chicago. The volatile market of the construction industry and the currently existing high demand for construction managers require construction students to be flexible enough to pursue available job opportunities regardless of geographic location. Visiting a place with high-rise buildings that are not usually available to construction students in college towns has a considerable attraction. Considering the time and length of the trip in accordance with the destination is another vital point in trip planning. In addition, the subject of the course can be a factor in the perception of usefulness by students in general site visits. As shown in Table 1, construction methods, site logistics, collaboration and communication were perceived more relevant to the sites visited. Although the results of this study indicate positive impacts of field trips on students' perceptions, generalization of the outcomes needs more exploration and data. The current study consisted of one class of students and therefore getting feedback and comments from other levels can strengthen the outcomes. Further studies can focus on comparisons between class levels as well as course subjects. In addition, the cities visited by each student cohort can also be compared.

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