# INCORPORATING FIELD TRIPS INTO THE TEACHING OF BUSINESS AND ECONOMICS: METHOD AND EVALUATION

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**Abstract**

Although field trips have been recognized as effective for bridging the gap between theory and practice, instructors rarely step out of the classroom with their students. One reason is that it is unclear how those trips can be efficiently incorporated into the traditional classroom. In this paper, we discuss the motivation, organization and outcomes of field trips in our *Managerial Economics* and *International Business* classes. We use cost-benefit analysis to evaluate the pedagogical value of field trips, and suggest that many of the benefits are non-pecuniary. Although the benefits are subjective and difficult to quantify, pre-and-post tests administered to students suggest that field trips improve their knowledge, as well as enable them to apply classroom learning to practical problems. The paper identifies factors that should be considered when planning and organizing field trips in economics and business.

Keywords: Field trips, experiential learning, learning outcomes, cost-benefit analysis, manufacturing

JEL Codes: A22, C83

## Introduction

The teaching of economics and business should accomplish a number of important goals, including content delivery and the application of course contents to the real world. It should also enable students to learn how knowledge gained from courses can be used to formulate policy, as well as make informed decisions (Buckles 1998). Anecdotal evidence suggests that most economics and business instructors focus more on the coverage of course content, and far less on other objectives. Without opportunities for students to step-out of the classroom in order to observe how real-world businesses operate, students forget that businesses play roles that transcend the quest for profit maximization. When in the classroom, students learn mostly about how firms expand their market shares, minimize cost and pursue their profit motive. By going out of the classroom to meet with business executives, employees and other stakeholders, students are better positioned to understand the *modus operandi* of firms, as well as the challenges and the broader roles that businesses play in the areas of social responsibility, ethics, sustainability, and civic engagement. The Business Economics Track at Allegheny College was established in 2001 partly to address the lack of emphasis on real-world and policy-related issues in the teaching of economics and business.

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The Track, which is offered within the Economics Department, was designed in a way that enables students to apply theoretical issues to real-world problems (Goldstein and Onyeiwu 2007). Our department has used various mechanisms to infuse real-world issues into our curriculum, including an executive-in-residence program, guest lecturers from the business world, one-on-one mentoring by business executives, an annual executive roundtable, credit-bearing internships and biennial experiential learning trips to New York City. We have, however, not systematically incorporated field trips into our curriculum. One of the authors of this paper had organized about 10 field trips to various companies in the past, but those trips were not pre-planned and students' perceptions of the outcomes of the trips were not solicited. The trips were not pre-planned in the sense that no scoping trips were undertaken prior to the trips, and no learning goals were explicitly articulated. We wish to begin the process of moving away from the traditional approach of teaching Managerial Economics and International Business, and explore ways of intentionally infusing experiential learning opportunities into these courses, with careful planning in order to maximize students' learning experience. This is in line with the interactive education method proposed by Lempert (1996), which encourages students to see the world for themselves, draw their own conclusions and raise awareness of society.

A major goal of this article is to discuss our experiences with the use of field trips for teaching economics and business courses. We discuss the planning, organization and logistics of field trips, using two iterations of trips to local companies in 2016 and 2017. The paper contributes to the literature on experiential learning in a number of ways. First, it estimates the costs and benefits of organizing field trips in economics and business courses. This is very important because, while scholars discuss the benefits and costs of experiential learning, they rarely estimate those costs and benefits (Lawson, 2007; Smith, 2007). We expect our cost-benefit analytical framework to serve as a benchmark for instructors who are interested in organizing field trips. Second, the paper proposes a template for crafting learning outcomes for field trips, as well as how to assess those outcomes. Specifically, we use both qualitative and quantitative information to assess the outcomes of field trips. Lastly, we suggest important measures that should be undertaken in order to foster a successful field trip.

**Literature Review**

The use of field trips as a pedagogical technique in the teaching of economics and business courses (Accounting, Entrepreneurship, Marketing, Finance, etc.) is atypical. Lempert (1996) is intrigued by the fact that the mainstream model of education in America has drifted away from American principles of "experimentation, pragmatism, participation and community." He argues that social scientists often teach from texts, and do not place their teaching within the context of real-world problems. Rather than encourage students to learn how to apply classroom knowledge to solving societal problems, they assign abstract exercises instead. While McGoldrick (1998) observes that economists have been very slow at using experiential learning (including field trips) techniques in their courses, Smith (2007) was perplexed that the first major article on the use of field trips in economics appeared in the *Journal of Economic Education* 36 years after the journal was founded!

In the few cases when field trips have been used by business and economics instructors, they ranged from visits to a horse racing center, a local auction house (Smith, 2007), a museum (Galizzi, 2014) and a historical park (Smith and O'Connell, 1997). During one such visit to a museum, students learned about the history of America's industrial revolution, and participated in a role-playing exercise about the division of labor (Galizzi, 2014). Out-of-classroom activities

in business and economics have typically been undertaken in the context of service-learning (McGoldrick, 1998; Paxton, 2015; and Smith, 2007). A common trend has been for instructors to use projects (for instance, managing investment funds), internships and business plan competitions as platforms for infusing experiential learning into their courses (Dolan and Stevens, 2006).

Although literature on field trips in business and economics classes is sparse, there is a very robust literature on experiential learning in higher education. Pioneered by Dewey (1938) and Lewin (1951), experiential learning has been recognized as a pedagogy that fosters interaction between the learner and her environment. Many studies on experiential learning highlight its value in reinforcing classroom teaching and learning (Simpson, 1997; Loomis and Cox, 2000; Walstad, 2001; Becker and Watts, 1996). Amongst the benefits of experiential learning is that it helps prepare college students for leadership positions in business and civic organizations (Middleton, 2005). Experiential learning is particularly valuable because it enables students to understand the applicability of their knowledge to solving practical problems (Eyler, 1993; Eyler and Giles, 1999). Ziegert and McGoldrick (2008) argue that service-based experiential learning fosters "deep learning," which they describe as learning that involves "critical thinking skills, integration of knowledge over time and subjects, theoretical application to practical situations and higher order skills of analysis and synthesis" (p. 40). Using the case of the Business Conditions and Economic Analysis (BCEA) program at the University of Richmond, Dolan and Stevens (2006) suggest that experiential learning can improve student skills and competencies dramatically.

The lack of interest by many business and economics instructors in experiential learning activities (and field trips in particular), despite their pedagogical value, is attributable to a number of factors. First, the explicit and implicit costs of organizing field trips can be high. This is coupled with the fact that instructors seem to be oblivious of the potential benefits of field trips for students, colleges and local communities. Second, some untenured faculty may consider it too risky to incorporate an unpredictable and unorthodox pedagogy into their courses, fearing that it may adversely affect their teaching evaluation, which is very critical for earning tenure, especially at liberal arts colleges. Third, business and economics courses, especially at the intro levels, cover too many topics within a semester, leaving little or no time for outside-the-classroom experiences. Fourth, mainstream economists believe that the realism of the assumptions of economic theory is not as important as its predictive power. Consequently, many economics instructors do not see compelling reasons for stepping out of the classroom to understand the nature of the real world, as long as the *predictions* of economic theory are accurate. The reluctance of business and economics instructors to undertake field trips has been reinforced by the fact that there has been no compelling evidence that field trips enhance test scores or foster positive academic outcomes (Lee, 1997; Koran and Baker, 1979; Becker and Watts, 1998). We argue below that field trips in economics and business do improve test scores, while also enabling students to apply their learning to real-world issues.

Given the dearth of literature on business and economics field trips, much of what is known about field trips is based on studies on trips undertaken in the natural sciences and K-12 schools, where students typically participate in trips to zoos, parks, shopping malls, museums, and big cities (Bauerle and Park, 2012). These studies suggest that field trips enable students to be aware of their environment, spur their interests in science, as well as enhance their observation and perception skills (Spence, 1991). It has also been observed that field trips foster community and collaborative learning, and promote cordial student-teacher relationships

(Hammerman and Hammerman, 1973; Bateson, 1981). Bauerie and Park (2012) show that field trips combined with homework assignments increase assignment scores in the plant sciences. They also argue that field trips in the sciences help students to develop their cognitive, emotional and physical faculties. It is partly on the basis of some of the positive outcomes highlighted by these studies that we decided to explore how we might use this experiential learning technique in our courses. A question that arose in this regard is what types of field trips should we adopt, and how should we structure them in order to accomplish our learning goals? We address these questions in the next section.

Field trips can be classified into two broad categories, depending on their *duration* and *focus*. In terms of duration, there are two types of field trips: extended trips and "one-off" trips. An extended field trip lasts for a week or more (Smith, 2007), while a one-off trip occurs over a short period, usually within a couple of hours. The learning outcomes from these trips may differ. Extended trips might give students the opportunity to participate in hands-on activities at the project sites. Students could also be involved in solving practical problems in local communities. A one-off trip is an opportunity for students to observe and contextualize theoretical concepts in real-life setup. Both types of trips enable students to interact with members of the community, and thus enhance their interpersonal skills. However, given time limitations and expenses, it makes more sense for theory-based courses (intro and intermediate micro and macro) to go on "one-off" trips and courses that are more applied or project-oriented to adopt extended trips. These include upper-level electives in economics and businesses.

Field trips can also be classified according to their focus. There are project-based, policy-oriented and firm-based field trips. The goal of a project-based field trip is to deepen understanding of a project, especially if the project enables students to contextualize the contents of a course. Policy-oriented field trips facilitate understanding of the various ramifications of a given policy, and the intended/unintended consequences of the policy (Smith, 2007). A firm-oriented field trip focuses on a visit to a single firm, with the goal of understanding the issues affecting the firm and the sector in which it is operating. The latter type of trip also enables students to ascertain how the theory of the firm explains the behavior of real-world firms. Smith (2007) undertook only one firm-oriented field trip and reported that it had positive outcomes.

Most of the studies on field trips are based on disciplines other than economics and business. Though insightful, the experiences from field trips in the sciences may not be directly relevant for the organization of field trips in economics and business. Economics and business instructors should begin to undertake field trips and gather information that would be more useful for organizing future trips. That is part of our motivation for experimenting with field trips in our courses. Our study is based on field trips to two firms (Acutec Precision Machining, and Seco Warwick Corporation) in Meadville, Pennsylvania, a visit to the on-campus kitchen facilities of Allegheny College's food-catering company (Parkhurst Dining Services, Inc.), and an on-campus presentation by one of the executives of Parkhurst. In the following sections, we discuss the planning of the trips, organization and logistics, post-trip debriefing, and the outcomes of the trips. Based on our experiences and the challenges we encountered, we suggest measures that should be considered when planning and executing field trips.

**Planning Field Trips**

This paper is based on two iterations of field trips for the following courses: *International Business* and *Introduction to Managerial Economics*. The first iteration was undertaken in the fall of 2016, while the second took place in fall of 2017. Our major goal was to fill the void in

the teaching of business and economics with regard to the non-application to the real world. We wanted to provide appropriate contexts within which students could apply and comprehend the concepts learned in class. While it is debatable whether alternative pedagogies such as case studies, videos, or the invitation of executives to our classes would accomplish the same goals, we chose field trips because they enable students to observe real-world firms and contextualize classroom learning in real-time. In contrast to alternative pedagogies, field trips enable students to develop interpersonal skills through interactions with executives, managers and workers. Baker and Griffin (2010) suggest that gaining interpersonal skills and networking is not a luxury but a necessity that facilitates student success. Moreover, we use cost-benefit analysis to explore whether field trips are valuable, and justify the associated costs.

With little to no guidelines on how to organize the field trips, we applied to the Provost of our college for a small grant to enable us work over the summer on developing the project. With grant in hand, we met periodically over a two-week period in the summer of 2016 to discuss issues related to the field trips. The first issue was the redesign of the syllabi for the two courses. The most challenging decision was identifying a suitable week for the trips. Undertaking a field trip very early in a semester is not advisable, as students may not have learned enough content to contextualize the field experience. Introducing the trip very late in the semester risks being undermined by the mad rush, as well as the burnout of faculty and students, that usually characterize the end of the semester. Thus, an optimal time for organizing a field trip in the fall semester is somewhere before the Thanksgiving break, and for the spring semester shortly before the spring break.

Another issue was the theme of the trips. To be meaningful for students, we recognized that field trips have to be carefully grafted onto some of the topics covered in class. The last thing students want to do is go on a trip that is unrelated to their classes. That is a recipe for disaster for the instructor! To develop appropriate themes for the trips, we decided to adopt what we refer to as a "Backward-Infusion" approach, rather than a "Forward-Induced" approach. In the former approach, an instructor undertakes a scoping trip to the organization to which she or he plans to take students. The instructor undertakes a guided tour of the organization; meets with the organization's managers and top executives, and learns about the organization's vision, mission and strategy. In contrast, a "Forward-Induced" approach is more prescriptive. Here, an instructor identifies some themes to be covered in class, and then asks the intended organization to set up the field trip according to a pre-packaged set of themes. While this approach may be easier, the instructor runs the risk of asking for what the organization is either not capable of doing, or unwilling to undertake.

We found that managers of manufacturing plants tend to be more interested in the production and engineering aspects of their activities, rather than the economics and business aspects. There is also the risk that the organization's activities may not be relevant to the contents covered in class. We adopted the "Backward-Infusion" approach in order to avoid those risks, as well as to enable us get to know the top executives of the organizations. Moreover, we chose "backward-infusion" because the overarching goal of our classes is not to test hypotheses, but to provide contexts for students to observe the application of class content. In other words, the "forward-induced" approach is more appropriate for courses that seek to test the veracity of certain theoretical postulations.

To identify appropriate themes, we addressed the question of which organizations to select for the field trips. Since this was our first attempt at explicitly incorporating field trips into our classes, we proceeded modestly. We identified two companies for the 2016 field trip, and

one firm for the 2017 trip.[3] One of the companies we visited in 2016 was Acutec Precision Machining, which is owned by a former Chair of Allegheny College's Board of Trustees. Acutec is a medium-sized, family-owned business that manufactures precision parts for the aerospace industry. Some of its customers include global corporations such as Boeing, Bell Helicopters, and Bombardier. It recently found new customers in Europe and the Middle East. During the 2016 trip, all of the 25 students in the International Business class and 12 of those in the Managerial Economics class went to Acutec.

It may be desirable to introduce a control group when designing field trips.[4] The control group enables instructors to assess the effects of field trips on the treatment group. In our case, the group that visited Acutec was the treatment group, while the control group consisted of students who stayed on campus. Students in the control group met with an executive of Parkhurst, who gave a presentation on the firm's sustainability strategy. To further understand the company's sustainability strategy, students toured the Parkhurst's kitchen facilities after the presentation. Parkhurst Dining Services, Inc., is a major food service company in northwestern Pennsylvania and the owner of the restaurant chain, Eat-n-Park, which runs the food service of a number of universities and colleges, including Allegheny. We used our contact with the campus manager of the firm to secure a visit to the company's on-campus facilities, as well as an invitation to a top executive to serve as a guest lecturer in the Managerial Economics class to discuss the company's strategic positioning. A total of 16 students in the Managerial Economics class went to Parkhurst. These students constituted our control group. A few of them were in this group, because they were not able to go on the Acutec trip, and the rest were chosen randomly.

While one might think that the control group should have been the students who did not go on any trip outside of the classroom, we had to let all students go on one trip or another, because that is required for our courses. It would be awkward to exclude some students from a field trip, especially when they may not fully understand the motivation for doing so. Moreover, visiting Parkhurst is like a placebo treatment. Since one of our learning goals for the 2016 trip was to ascertain whether field trips improve students' understanding of manufacturing (more on learning outcomes in the next sections), we expected that students who visited the campus kitchen would not see any improvement in their knowledge of manufacturing.

In designing field trips, however, we suggest a control group of students who did not go on a trip. Then their course performance or learning outcomes can be compared with those that went on the trip. The control group could experience alternative experiential learning pedagogies (case studies, videos, guest lectures by CEOs, etc.). For instance, half of the students in a class could go on a field trip (the treatment group), while the other half (the control group) are shown a recorded interview with a CEO of a company. That video interview may also show the CEO taking visitors on a tour of the company, as well as explaining the strategies and operations of the firm. Pre and post-tests could assess which of the groups learned more, using some preselected learning outcomes.

We selected Seco Warwick, a global manufacturer of industrial furnaces, for our 2017 field trip. The company has been operating in Meadville, Pennsylvania, since 1958. Polish

[3] Acutec Precision Machining and Parkhurst Corporation were used for the first iteration in 2016, while Seco Warwick was selected for the trip in 2017.

[4] The use of control and treatment groups may be necessary for instructors who are undertaking field trips for the first time, and who seek to ascertain the learning outcomes from those initial trips. Once the pedagogical value of a field trip has been established, there may not be need for control and treatment groups for subsequent trips.

investors bought a majority of the company's shares in 2005, and moved the headquarters to Warsaw. It supplies industrial furnaces to customers in a variety of industries, including Boeing, Airbus, Ford, and General Electric. The trip to the company was facilitated by the program coordinator of Allegheny's Center for Business and Economics (CBE), who previously worked for the company for over 20 years. All of the students in both classes (55 in total) rode on two buses to Seco Warwick during the 2017 trip. These adjustments to the experimental design were prompted by the fact that our learning goals for the 2017 trip were different from those of 2016. Moreover, trying different strategies (2016 with the control group and 2017 without the control group) enabled us to compare and contrast two different experimental designs. In the next sections, we discuss the organization of the field trips and the learning outcomes from the two experimental designs.

**Table 1**: **Data Summary of Student Characteristics**

| **Variable** | **Obs** | | **Mean** | | **Min** | | **Max** | |
|---|---|---|---|---|---|---|---|---|
| | **2016** | **2017** | **2016** | **2017** | **2016** | **2017** | **2016** | **2017** |
| Male | 52 | 55 | 0.79 | 0.69 | 0 | 0 | 1 | 1 |
| White | 52 | 55 | 0.75 | 0.65 | 0 | 0 | 1 | 1 |
| GPA | 48 | 53 | 2.99 | 3.14 | 2 | 2 | 3.94 | 3.86 |
| Hours study/ week for this class | 50 | 55 | 5.4 | 3.8 | 1 | 1 | 25 | 11 |
| Economics major | 52 | 55 | 0.75 | 0.67 | 0 | 0 | 1 | 1 |
| Course relevant to manufacturing** | 52 | 55 | 3.48 | 3.34 | 1 | 1 | 5 | 5 |
| Desire to work in manufacturing **before** the trip* | 52 | 54 | 2.15 | 2.15 | 1 | 1 | 5 | 5 |
| Desire to work in manufacturing **after** the trip* | 41 | 49 | 2.59 | 2.84 | 1 | 1 | 5 | 5 |
| Knowledge about manufacturing in the U.S. **before** the trip** | 52 | 55 | 2.34 | 2.38 | 1 | 1 | 5 | 5 |
| Knowledge about local manufacturing **before** the trip** | 52 | 55 | 1.73 | 1.54 | 1 | 1 | 4 | 5 |
| The trip helps increase knowledge about manufacturing in the U.S.* | 41 | 52 | 3.84 | 3.98 | 1 | 2 | 5 | 5 |
| The trip helps increase knowledge about local manufacturing* | 41 | 52 | 3.85 | 4.17 | 1 | 2 | 5 | 5 |

*1 is "least likely"; 5 is "most likely"

** 1 is "nothing at all"; 5 is "a lot"

**Organizing Field Trips**

Prior to our trips to the 2016 and 2017 field sites, students were given an anonymous "pre-field trip survey" to complete. The goal of this survey was to obtain basic information about the students' gender, ethnic, academic and parental educational/career background.[5] This information is important to ascertain the extent to which some of our learning outcomes are correlated with students' demographic characteristics. Data from the demographic surveys of the students are reported in Table 1.

As Figures 1 to 8 show, about 80 percent of the students who went on the 2016 trip were male, while 75 percent were white. These data reflect the gender composition of Economics students at Allegheny College, where a preponderance of Economics majors are male and white. The average GPA of the students who went on the 2016 trip was about 3.0. The majority of the students expressed a relatively low desire to work in manufacturing (average score of 2.15 out of 5 scale, where 5 represents "most likely to look for a job in manufacturing"). They also considered themselves not knowledgeable about manufacturing (2.34 out of 5, where 1 represents "nothing at all" and 5 was "a lot"). All of the students said they did not know much about manufacturing in the local economy before the trips (1.73 out of 5).

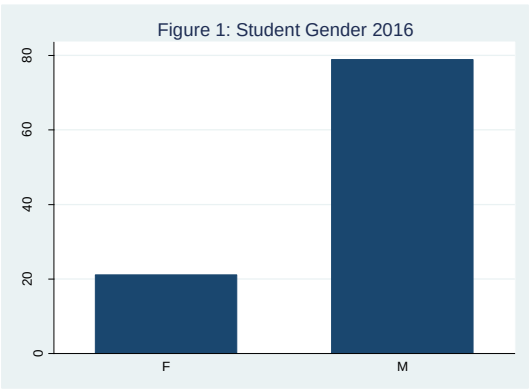
Students on the 2017 trip were relatively more diverse than the 2016 iteration, reflecting recent changes in Allegheny's demographic profile. About 69 percent of the students who participated in the 2017 trip were male and 65 percent were white. Their average GPA of 3.14 was slightly higher than that of their peers in 2016. They still had a low intention to seek a manufacturing job (2.15 out of 5 scale). Similar to the 2016 cohort, they were very modest when estimating their knowledge about manufacturing in the United States, as well as manufacturing in the local economy (less than 2.5 out of 5 scale for both categories).

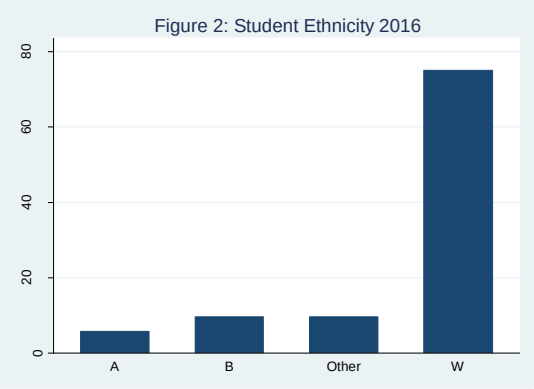
After the completion of the demographic surveys in 2016, the students and faculty car pooled to Acutec. During the 2017 trip to Seco Warwick, however, we rented two buses instead. While it was obviously inexpensive to car pool, there were risks involved. Allegheny College may be legally liable for whatever happens to students in cars driven by other students. This risk was particularly worrisome, because the college did not have insurance policies to cover liabilities associated with field trips, nor were there college-wide policies governing how faculty should conduct field trips.

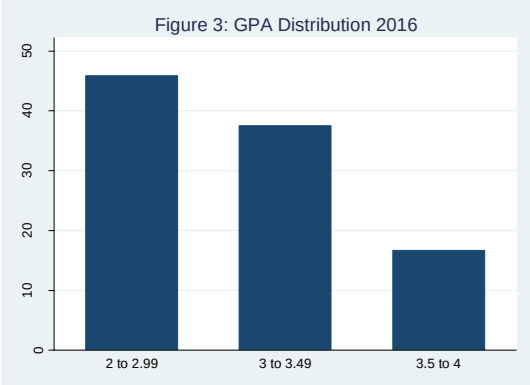
At the factories, after a short greeting and introduction of the companies' managers, students were divided into groups of about 12 for approximately one-hour tours of the facilities at Acutec and Seco Warwick. In each group, an employee explained the company's business model, strategy and production processes while showing students around. Students also had the opportunity to speak with shop-floor workers during the tour. Afterwards, the groups convened in the companies' auditoriums for post-tour discussions. The top executives of the two firms tried to contextualize observations made by students and faculty during the tour and answered questions.

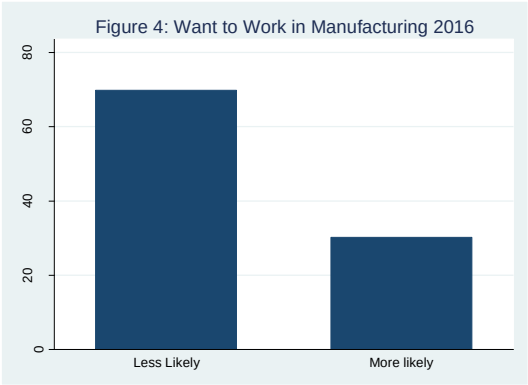
The rest of the students in Introduction to Managerial Economics went on the Parkhurst "field trip" in 2016. On the day of the class, an executive of Parkhurst gave the group an in-class lecture on the company's business model and sustainability strategy in a conference room at the Student Center, which was very close to Parkhurst's kitchen facilities. The students heard that "sustainability" is a central component of the firm's strategy, and that the company wants to position itself as a food service company that is sensitive to the health of its customers.

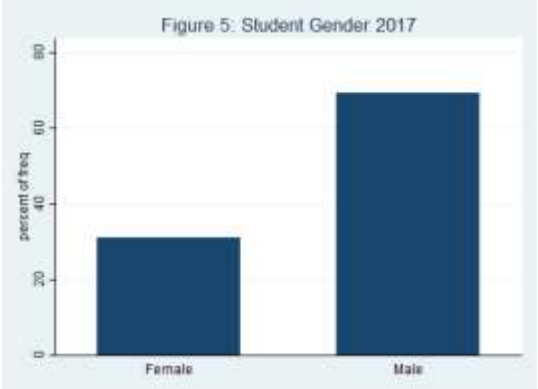
[5] Given the confidential and sensitive nature of this information, we sought and obtained approval from Allegheny's Institutional Review Board (IRB) before administering the survey.

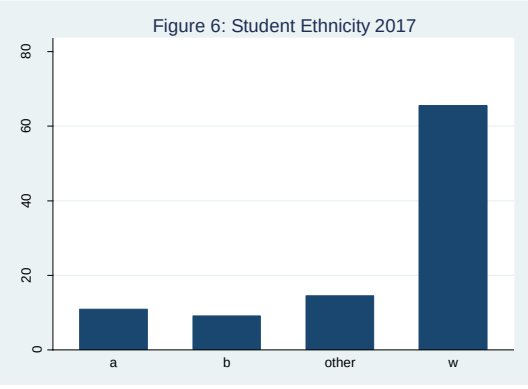


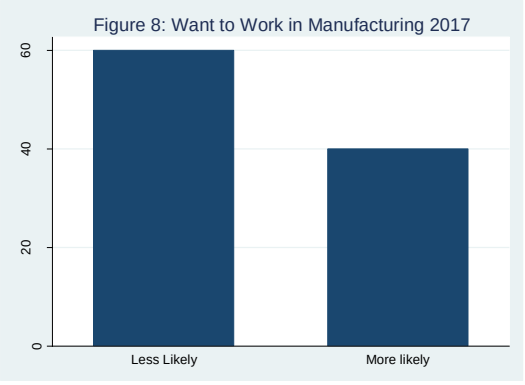








After the half-hour lecture, the group (including the two instructors) toured Parkhurst's on-campus catering facilities to observe the company's operations. The activities lasted about two

hours. Students who visited Acutec the previous week did not have to participate in Parkhurst's activities.

**Debriefing after Field Trips**

A debriefing session took place during the next class following each of the trips. A major goal of the debriefing was to integrate observations during the trip with some of the topics covered in class. The sessions also enabled the instructors to ascertain the extent to which students were able to apply what they learned in class to real-world problems. The sessions typically started with the instructor asking students to discuss their most memorable observations during the tour of each company. In those discussions, some key concepts learned in class were highlighted by the students.

One student in the International Business class said he "was surprised to learn that Acutec places a lot of emphasis on skills." One of the themes in this class is that firms cannot compete effectively in international markets without unique skills and capabilities. "Is Acutec really a global corporation. It sells to domestic customers, who in turn export Acutec's products," another student commented. Yet, another student observed that Acutec "focuses on raising worker productivity, which explains why the company made the decision to purchase 3D printers."

Students in Introduction to Managerial Economics discussed the sources of Acutec's competitive advantage, the challenges Acutec faces, government policies that affect Acutec, and the company's impact on the local community. They debated whether Acutec is environmentally friendly. Most of the students realized that Acutec's key competitive advantage is the company's decision to make huge capital investments in support of customers' needs. The firm uses complex machinery and computers to reduce labor costs. Moreover, students identified Acutec's policy of encouraging workers to brainstorm and generate innovative ideas as a source of competitive advantage. They hire anybody who has good work ethic and ability to learn, including those without college degrees in engineering. That helps keep labor costs even lower and strengthens Acutec's competitive advantage against its rivals.

Acutec had been under intense competition, including copyright violations by Asian and Mexican companies, and that the appreciation of the US dollar had negatively affected the firm's exports. Many of the students were intrigued to hear how changes in exchange rates affect real-world firms. Another insightful learning moment occurred when students were told that government requirements to provide health insurance for workers had the perverse effect of weakening the company's global competitiveness. An interesting observation that relates to the content in Introduction to Managerial Economics is that Acutec has been trying to be environmental friendly by reducing and recycling its waste. It has donated generously to the local community and intentionally hired local people. About 75 percent of Acutec's workers are from the local community. Students also heard that "lean manufacturing" and "ISO Certification," are strategies that Acutec uses to minimize production costs while maximizing output. In other words, students had the opportunity to learn how a non-imaginary firm organizes its production function.

The structure of the 2017 debriefing sessions in each of the two classes was similar to that of 2016. In the Introduction to Managerial Economics class, students discussed Seco Warwick's competitive advantage in fast-changing domestic and international markets. They noted that Seco Warwick's main contributions to the local economy were in the areas of job creation and charitable contributions. They realized, however, that it is not obvious that the

company is environmental friendly or goes the extra mile to fulfill its corporate social responsibility, two important topics in this class. Given that this class is about Managerial Economics, students wished to see less of the factory and more of the firm's management-related activities. Students also seemed to be interested in the decision-making process to position the firm in the market. They seemed to enjoy the CEOs' presentations and Q&A sessions more than touring the factories. This are important lessons for us in organizing future trips.

The role of field trips in helping students contextualize classroom learning was evident during the debriefing session in the International Business class. One student pointed out that he was intrigued by the configuration of Seco's global value chain, and wondered why low labor cost was one of the factors that motivated the firm to locate some of its operations in Poland. The student said he would never have imagined that Poland could have a low labor cost advantage. Another student attributed Seco's decision to invest in foreign markets to the cyclical nature of the market for industrial furnaces, which tends to make the domestic market for furnaces volatile and unpredictable. Since patented technology is one of Seco's competitive advantages, some students wondered what would happen to the firm when those patents expire.

Overall, the 2016 and 2017 debriefing sessions suggest that the vast majority of the students were able to integrate class materials with field observations.

**Experimental Design and Learning Outcomes of Field Trips**

College-level field trips should not be motivated purely by the need to break "boredom" in the classroom, or to enable students "see the world," though these can also be valuable experiences. It is important that the field experience enhances student learning, or at the very least, provides a context within which they can understand the course materials. In this section, we assess the outcomes of the 2016 and 2017 field trips.

One of the challenges of organizing field trips is how to design instruments that would enable the instructor to objectively measure the outcomes of the trip. It is therefore very important that instructors articulate a set of measurable learning outcomes prior to embarking on a field trip. Our primary goal for the 2016 iteration was for students to learn about manufacturing and the local economy. We also sought to know whether the trips had any effect on students' career preferences.

The inclusion of a control group is important for assessing the impact of field trips, especially if those trips are undertaken for the first time. Campbell and Stanley (1963), quoted in Harrison et al. (1983, p.66), identify three factors that make the inclusion of a control group crucial. The first factor is the "history problem," in which extraneous events occur at the time of the treatment event. The second factor is the "maturation problem," when extraneous events affect the dependent variable as a function of time. One potential extraneous event in our case could be the exposure of all of the students in the Managerial Economics class to information about manufacturing prior to the field trip. The third factor is "self-selection bias," whereby the treatment group (the Acutec group) is subjected to the treatment in a way that differs systematically from the population of interest. Considering that our field trips may be susceptible to these three factors, we used students in the Managerial Economics course who only toured Parkhurst's campus kitchen and listened to a talk by a Parkhurst representative as our control group.

To assess the extent to which our learning goals were accomplished, we designed two surveys for students to complete before and after the 2016 trips to Acutec and Parkhurst. The surveys included questions about students' knowledge of manufacturing in general, and local

manufacturing in particular. Each student was randomly assigned an identification number, which they anonymously wrote on the surveys before and after the field trips (in order to maintain confidentiality). The response rates were above 95% in both years, and the results are reported in Table 2.

Table 2 shows students' feedback after the trips by gender, race and GPA. While the differences across most of the assessment criteria are not statistically significant, the students who visited Acutec said that the field trip helped them understand manufacturing nationally and locally, while students who visited Parkhurst's kitchen facilities on campus said that their trip did not help them at all. As expected, the differences between the perceptions of manufacturing in the United States by those who went to Acutec and those who visited Parkhurst were statistically significant at the one percent level. However, the two groups' post-trip responses were not too different when asked about the local economy understanding and their propensity to consider a career in manufacturing. These findings are not surprising, because one single trip is unlikely to give a full picture of Meadville's economy, or to influence students' career paths.

In addition to assessing how much they learned about manufacturing and the local economy, we also wanted to know whether the field trips helped them understand some of the contents of the two courses. To this end, we used qualitative (or narrative) information from students' end-of-semester course evaluations as presented in Allegheny's Report of Student Experience (RSE).[6] Table 3 summarizes some of the students' qualitative assessments of the trip to Acutec Based on those comments, we believe that students learned and contextualized some key concepts that are relevant to the two courses, including the following: outsourcing, skills and human capital, technology, vertical integration, ownership structure, competitive advantage, and firm growth. Of all the 38 students who went on the Acutec trip, only one commented negatively on the trip. The 2017 post-trip surveys also show that students overwhelmingly valued the experience, and would be willing to undertake another field trip.

[6] Allegheny College's evaluation has both quantitative and qualitative segments. We focus on the qualitative segment in our analysis of the outcomes of the field trips.

**Table 2: Comparison of Students' Feedback after the Trips**

| | Gender | | | | Race | | | | GPA | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| To what extend has this trip helped you understand manufacturing in the U.S.? | F | | M | | W | | NW | | High | | Low | |
| | 2016 | 2017 | 2016 | 2017 | 2016 | 2017 | 2016 | 2017 | 2016 | 2017 | 2016 | 2017 |
| | 3.9 | 3.68 | 3.8 | 4.11 | 3.9 | 3.97 | 3.56 | 4 | 3.96 | 3.94 | 3.67 | 4.08 |
| To what extend has this trip helped you understand manufacturing in Meadville? | F | | M | | W | | NW | | High | | Low | |
| | 2016 | 2017 | 2016 | 2017 | 2016 | 2017 | 2016 | 2017 | 2016 | 2017 | 2016 | 2017 |
| | 3.9 | 3.87 | 3.83 | 4.3 | 3.94 | 4.08 | 3.5 | 4.33 | 3.91 | 4.21 | 3.73 | 4 |
| To what extend has this trip helped you understand the local economy | F | | M | | W | | NW | | High | | Low | |
| | 2016 | 2017 | 2016 | 2017 | 2016 | 2017 | 2016 | 2017 | 2016 | 2017 | 2016 | 2017 |
| | 3.4 | 3.31 | 3.38 | 3.38 | 3.42 | 3.38 | 3.25 | 3.33 | 3.65 | 3.36 | 3 | 3.25 |
| After the trip, would you be more likely or less likely to work in manufacturing | F | | M | | W | | NW | | High | | Low | |
| | 2016 | 2017 | 2016 | 2017 | 2016 | 2017 | 2016 | 2017 | 2016 | 2017 | 2016 | 2017 |
| | 2.7 (2) | 2.4 (1.88) | 2.54 (2.2) | 3.02 (2.27) | 2.54 (2.15) | 3.06 (2.08) | 2.75 (2.15) | 2.37 (2.3) | 2.56 (2.11) | 2.94 (2) | 2.53 (2.27) | 2.63 (2.7) |

| Learning Objective Scores (total 20 points) | F | | M | | W | | NW | | High | | Low | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **2016** | **2017** | **2016** | **2017** | **2016** | **2017** | **2016** | **2017** | **2016** | **2017** | **2016** | **2017** |
| | - | 15 (8.88) | - | 15.8 (9.81) | - | 15.7 (10) | - | 15.22 (8.78) | - | 15.73 (9.51) | - | 14.91 (9.66) |

**Note**: Numbers in parenthesis are from Pre-trip survey. T-tests showed statistically significant (at the 5 percent level) difference between Male vs. Female students and between White vs. Non-White students on the question about having a career in manufacturing. 2016 trips were not designed with Learning Objective Scores.

## Table 3: Summary of Students Comments

**Concepts learned: Outsourcing, Salience of Skills and Human Capital, Technology, Vertical Integration, Ownership Structure, competitive advantage, Firm Growth**

*Sample Student Comments that Reflect the Above Concepts:*
"it was interesting to hear their (Acutec's owners) opinions on outsourcing"
"it was valuable to know that Acutec relies heavily on skill-intensive labor"
The company's philosophy stood out most to me. They stressed that their employees are their competitive advantage which I found unique considering most employees do not have college degrees whereas competitors often hire engineers".
"I learned how Acutec was able to be much more effective through technology".
"Acutec's vertical integration strategies that have all brought success to Acutec"; realizing that
"Acutec is impressive for being still family owned but it is able to compete with other big companies."
"learning about how Acute has grown and expanded over the years".

*Negative Comment:*
"The trip to Acutec was the least helpful in this course (International Business) because the firm operated differently than what we discussed in class; the company is privately owned, rather than publicly owned."
Instructors' note: Apparently, International Business as a course typically focuses on big publicly owned corporations, and the student found it to be an aberration that a small, family owned business in a small town could compete in foreign markets. This was an important learning experience that we did not foresee.

**Key Expressions from 2017 post-trip surveys:**
Learned about the firm's competitive advantage
Understood the ways by which a real business works
Gained insight into how the firm operates globally
It was interesting to hear about how cultural practices affect businesses
Learned how Seco interacted with its stakeholders
Understood the challenges of dealing with customers
Had a better understanding of a local business
Talking with an actual factory worker was a great experience

**Negative Comments**
We spent too much time touring the factory, rather than discussing management and business related issues. I am less interested in the technical side of Seco's operations.
We should have been given extra credits for the large amount of time we spent on this field trip.

We next assess the outcomes of the 2017 field trip. There are substantial learning effects in organizing field trips. Subsequent trips benefit tremendously from the experiences gained from previous trips. One of the important lessons learned from the 2016 trip was the salience of crafting learning outcomes that can be assessed objectively. Thus, the 2017 learning outcomes

are different from those of 2016 and are more closely tied to the contents of our courses. The 2017 learning outcomes are:

- Understanding production functions in manufacturing, particularly the manufacture of furnaces.
- Learning about manufacturing technology in general.
- Gaining knowledge of the local economy and the corporate responsibility activities of a local company.
- Using the case of Seco Warwick to understand the strategies that firms use to compete locally and globally.

To measure the extent to which these outcomes were achieved, we designed pre- and post-tests containing 20 multiple-choice questions spread across the four learning outcomes.[7] The summary of students' test scores are reported in the last row of Table 2. The mean score for the pre-test was 9.52 out of 20, with a standard deviation of 2.52. The mean for the post-test was 15.56, with a standard deviation of 2.25. This suggests there was a 63 percent increase in student performance as a result of the field trip. Student performance varied slightly by gender, ethnicity and academic abilities, but most of the differences were not statistically significant. However, after the trip, male and white students were significantly (at the 5 percent level) more likely to seek a job in manufacturing than female and non-white students, respectively. This reflects a complex correlation between students' career orientation and experiential learning, which could be an interesting topic for future work. One reason that male students experienced larger changes in their understanding of manufacturing may be attributed to the fact that manufacturing has historically been a male-dominated sector. The larger changes in the understanding of manufacturing by white students can be explained by the lack of racial and gender diversity at the two factories we visited.

We did not construct a control group in the 2017 setup because our goals were different from those of the previous year. In 2016, besides improving student learning, we were interested in identifying the value of a field trip to a manufacturing firm compared to a guest speaker's presentation on sustainability in the food services sector. Given students' positive learning experiences from the 2016 field trip, we became more confident about the benefits of a field trip. We therefore decided to take all of our students on the 2017 trip and focused on evaluating student learning before and after the trip. It was also easier to organize one trip for the entire class, instead of taking two groups (control and treatment groups) to two separate locations on two different days.

Cost-benefit analysis is another way to assess the value of field trips. Table 4 shows the costs and benefits of the 2016 and 2017 field trips. That most of the benefits of field trips are non-pecuniary and difficult to quantify complicates the analysis. The Contingent Valuation Method (CVM) could be used to input monetary values on the benefits, but this task is beyond the scope of the present article. Consequently, rather than ascertaining whether the benefits of field trips exceed the costs, we merely identify the various benefits and costs. We decompose the costs and benefits, explaining each component, in Table 4.

The marginal cost of undertaking successive trips falls over time, while the benefits increase and can offset the costs. Transportation expenses increased slightly in 2017, but

[7] As mentioned earlier on, students took the pretest about 30 minutes before departure to Seco Warwick. The identity of the company was deliberately concealed from the students until the day of the trip. This was to avoid students accessing information about the company prior to taking the test.

opportunity costs decreased, because of the savings in faculty and companies' intellectual capital costs. As a result, total cost decreased.

**Table 4: Cost-Benefit Analysis**

| **Costs** | **Benefits** |
|---|---|
| Faculty:<br>- Pre-trip Travel[1]: $3 (2016)<br>$3 (2017)<br>- Field trip day travel[1]: $3 (2016)<br>$3 (2017)<br>- Intellectual capital cost[2]:<br>$2000 (2016)<br>$1000 (2017) | Faculty:<br>Besides receiving a small stipend $500 (2016), organizing field trips is an opportunity for faculty professional development through presenting results at conferences and publication. Those trips also foster close interaction between faculty and students. This could lead to better report of student experience. At the same time, they improve faculty's understanding and appreciation of the local community. |
| Students:<br>- Field trip day travel[1]: $45 (2016)<br>$0 (2017)<br>- Opportunity costs[2]: $406 (2016)<br>$565.5 (2017) | Students:<br>These trips are often the first-time visit to a real world manufacturing company for most of the students. They provide opportunities to deepen students' knowledge of course content. Close interaction with faculty and classmates in an informal environment can improve class dynamic. Direct interaction with CEOs enables students to ask questions and better prepare for future job interviews. |
| Other parties:<br>- Allegheny college[3]:<br>$500 + $45 (2016)<br>$110 (2017)<br>- Companies' implicit costs[2]:<br>$462 + $262 (2016)<br>$462 (2017)<br>Summary:<br>- Total implicit cost: $3130 (2016)<br>$2027.5 (2017)<br>- Total explicit cost: $590 (2016)<br>$116 (2017)<br>- Total cost: $3720 (2016)<br>$2143.5 (2017) | Other parties:<br>- Allegheny College: Field trips add value to the college educational offering; promote town-gown relationship and enhance the college's image positively in the local community; positive interaction with companies from field trips might increase internship opportunities for the college.<br>- Companies/hosts/sites: Besides small gifts from faculty, companies can promote their images through these visits and recruit interns from the college. Field trips are also opportunities for firms to gain alternative perspective and knowledge from students and faculty through direct and on-the-spot discussion. |

[1] Travel cost in 2016 is the estimated product of the round-trip distance from Allegheny College to a local company and $0.54/mile compensation. We had 9 cars driving on the day of the field trip in 2016. For 2017, a bus charged $1/person each way. We had 55 students on the trip. The Department of Economics covered for the travel cost in 2017. Two faculty and two staff drove in one of the staff's car.

[2] Faculty's opportunity cost is the product of 10 summer working days at the cost of $100/day for two faculty in 2016. In 2017, 2 faculty only met 5 days to plan the trip. The students' opportunity cost is the product of 2 hours working at the minimum wage of $7.25/hour for about 75% of the students. Companies' opportunity cost is the product of 4 hours working at the average wage per hour for CEOs in Pittsburgh area. We spent 2 hours with them in our pre-trip visit and 2 hours during the field trip. Parkhurst Sourcing and Sustainability director drove from Pittsburgh to Allegheny College to give a presentation for our class so we counted his travel expenses in 2016.

[3] Allegheny College's costs include lunch compensation for 2 faculty working over the summer 2016, gifts for the managers, and bus tickets for students in 2017.

On the benefit side, the more trips instructors undertake, the stronger the bond between the college and the local community. Moreover, the trips helped improve faculty and student understanding and appreciation of the local community. Direct interaction with CEOs enables students to ask questions and better prepare for future job or internship interviews. In other words, they gain interpersonal and soft skills that are essential for success in the job market. Close interaction among faculty and classmates in an informal environment can improve class dynamics. Organizing field trips is an opportunity for faculty professional development through presentation of results at conferences and/or publication. Lastly, firms may gain knowledge from students and faculty about becoming better corporate citizens and improving their corporate public image.

**Conclusions**

Pre- and post-tests from our field trips suggest that this form of experiential learning results in better test performance, thus enhancing students' understanding of the contents of a course. Post-trip surveys and debriefing sessions indicate that field trips provide contexts within which students apply concepts learned in class to real-world issues. Cost-benefit analysis suggests that field trips have non-pecuniary benefits and these may differ among instructors. Because those benefits are difficult to quantify, ascertaining whether the benefits exceed the costs would be onerous. The calculus of the benefits and costs of field trips could change by instructor and by class. While the inclusion of implicit costs raises the cost of field trips, those costs fall over time as instructors undertake subsequent trips. There are also substantial learning effects associated with field trips, as subsequent trips tend to be better organized and more effective than initial trips.

Apart from providing contexts for applying concepts, field trips add value and enrich a class. They become a focal point for class discussions for the rest of the semester. Nearly all the topics discussed in the International Business class after the 2016 and 2017 trips were done in reference to Acutec and Seco Warwick. In a sense, both firms became the poster children for important class discussions. For the rest of the semester, one frequently heard comments such as: "but that's not what Acutec did;" "Acutec should have done X or Y." In a discussion of entry strategies into foreign markets, students wondered why Seco Warwick did not license its brand name and technology to its Polish partners, rather than going into a joint venture with them.

Field trips are effective ways of teaching students about a sector as well as the local economy. Most of the students who went on the trips to Acutec and Seco Warwick had never visited a manufacturing plant before. Many students commented that they learned much about manufacturing during the trip. It is also common knowledge that students who attend colleges located in small communities rarely step out of their campuses to learn about the local economy. By taking the students into the community and learning about a sector they had no prior knowledge of, field trips produce non-academic value that may improve students' awareness of local communities and the economy.

**Suggestions for Future Field Trips**

Based on our experiences in organizing field trips, we offer the following suggestions for structuring future trips:

*Apply for Funding to Support Trip Planning:* Introducing new teaching techniques often require planning and sustained efforts by faculty. Given the high opportunity cost of instructors' time during the semester, summer break is a good period to plan for trips in the fall and winter

break is a good period to plan for trips in the spring. Universities and colleges often have funding for faculty development that instructors could use to pay for expenses associated with identifying potential field trip locations, as well as pre-trip visits to those locations (i.e. "Backward Infusion" approach). Funding may also be available to pay a stipend to compensate for the opportunity cost of instructors' time in planning field trips. Instructors who are planning field trips should consider applying for funding to support their endeavors.

*Identify Expected Learning Outcomes before the Trip:* A challenging aspect of organizing field trips is identifying testable learning outcomes. It is helpful to identify what you expect to accomplish with a field trip. This helps design the pre- and post-survey questions to capture those outcomes. Adding outcomes that can be quantified not only reduces subjectivity in the evaluation of the outcomes, but also enables a quantitative analysis of the results. Overall, articulating expected outcomes improves the quality of survey questions. We found it helpful to design the learning outcomes right after the faculty had taken the pre-trip visit to the sites.

*Include a "Treatment" and a "Control" Group in Experimental Design:* In assessing the learning outcomes from field trips, it is important to minimize subjectivity by randomly designating some students as the "treatment group" and others as the "control group." The treatment group should go on the trip, while the control group would either not go on the trip, or be subjected to an alternative experiential learning pedagogy. If the control group is shown an interview with firms' executives or listens to guest speakers in class, instructors should make sure that the content and topics of those interviews or discussions are consistent with what the treatment group might see and hear during the field trip. One suggestion is to record the presentation and Q&A session at the host firm and show them to students who did not participate in the field trip. This design is appropriate in cases where instructors are uncertain about the benefits of field trips compared to other pedagogical alternatives. But once instructors are more convinced about the benefits of field trips, they should take all students on a trip and then show them how much they learned by comparing their knowledge before and after the trip. Students often appreciate the experience more when they realize how much they have learned from a field trip.

*Not All Field Trips Require "Treatment" and "Control" Groups:* We wish to emphasize, however, that treatment and control groups may be necessary only when the learning outcomes from a particular kind of field trip are unclear. Once the outcomes from an initial trip are positive, there may not be need for treatment and control groups for future trips. By the same token, if previous studies unambiguously affirm the pedagogical value of a field trip, instructors that are planning field trips may choose not to use treatment and control groups in their trips.

*Include Managers and Executives of Companies in the Debriefing Sessions:* Some students complained that there was not enough time after the tour of Acutec factory to discuss students' observations in the factory. One way of addressing this problem is to have managers from the companies participate in the debriefing sessions that take place in class, or to schedule a longer Q&A session at the end of the trip.

*Find the Right Balance between Tour of the Company and Q&A Sessions with the Firm's Executives:* In economics and business field trips, it may be unwise to spend too much time touring the company's facilities. Economics and business students are more interested in discussing the firm's strategy and management-related issues, rather than the firm's technical operations. A significant number of students on our 2017 field trip thought we spent too much time touring the factory, and spent less time discussing management-related issues.

*Avoid Organizing Field Trips That Overlap with the Lunch Hour:* Workers and managers often lose momentum toward the lunch hour. Some important staff members may have gone for lunch when they are most needed by the visiting students and faculty. As well, students value their lunchtime, and may frown at the idea of going on a field trip that interferes with lunch, unless the provision of lunch is part of the trip.

*Require Students to Come to the Field Trip With Note Pads and Pens:* To facilitate post-trip debriefing and completion of surveys, students need to take notes. This is very important, as the debriefing usually takes place a couple of days after the trip. Taking notes during tours of a factory, as well as during conference-room discussions, is a mark of respect for the managers of companies. It empowers factory managers, and indicates that their views and opinions are valuable. It also helps to mitigate the perception (rightly or wrongly) by blue-collar workers that college students are elitist and unappreciative of the work that non-credentialed workers do.

*Ensure that Students Comply with the Company's Safety and Security Protocols:* Touring a manufacturing plant is inherently risky. Sparks from welding equipment may cause irreparable damages to students' vision, as ca metal chips that fall from various cutting tools. There are also dangers from heavy objects falling off cranes, or protruding sharp objects that may not be clearly visible. This is quite apart from areas of the factory marked "toxic" and "out-of-bounds" to unauthorized visitors. It is standard practice for students to wear company-provided glasses, helmets, and other protective gears before entering a factory. Flip-flops and open-toed foot-wear are usually not allowed in factories. It may also be helpful to enquire, in advance, whether the company has security policies for US and non-US students. Some manufacturing firms that supply the US Defense Department are required to identify non-US citizens who visit their plant.

*Use Network to Identify Companies to Visit:* Identifying and soliciting companies to visit on a field trip can be a very daunting task. Making cold calls to companies that you had no previous contacts are unlikely to succeed. Our experience shows that it is more efficient to use networks to identify and contact potential companies to visit. The institution's vendors, Board of Trustees members who own businesses, and alumni can be important networks for field trips. But all networks are not born equal. Our experiences suggest that it is more effective to develop networks at the highest levels of a company. Arranging a field trip through mid-level managers may not succeed, as they usually do not have enough influence to persuade management to agree to the trip.

*Select Field Trip Locations That Are Close to Campus:* To minimize disruptions in students' schedules, it is helpful, as much as possible, to select sites that are not too far away from campus. For students, there is a huge opportunity cost involved in participating in field trips. Students' perception of the value of a field trip can be clouded by the extent of this opportunity cost. Our hypothesis is that students are more likely to value a field trip that causes less disruption to their schedule, than one for which they have to miss too many classes, or give up some of their regular chores. Some students suggested the award of extra credit to compensate them for the opportunity cost of going on field trips.

*Other Potential Sites and Companies for Future Trips:* The manufacturing sector is not the only appropriate site for field trips. Other potential industries include: information and communication technologies, financial institutions (such as banks and investment companies), non-profit organizations (such as hospitals, assisted living houses, and museums), and government agencies (the Food and Drug Administration (FDA), the Federal Deposit Insurance Corporation (FDIC), etc.).

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