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An Introduction to the Special Issue on Field-Based Education

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This special issue in field-based education (also known as “experiential learning,” “live consulting projects,” “client-based projects,” “field projects,” and the like) shares unique and new insights into such courses and projects. Field training—student educational experiences that include participation in a practical setting—with industrial partners, nonprofit organizations, or government agencies or in other applied settings have great value for students of operations research/management science (OR/MS) and have growing popularity. Combining the applied and the theoretical gives students a chance to face the challenges of using analytical techniques in the real world. However, instructors wishing to use field training face several challenges: recruiting projects from and working with local organizations, ensuring academic rigor, and handling the vagaries of real-world client projects. The aim of this special issue is to share experiences and best practices to reduce the cost and improve the quality of such fieldwork experiences for students and instructors. Four articles give researchers and instructors alike new perspectives into such offerings.

The lead article by special issue editor Michael Gorman (2018), “A Survey of Research in Field-Based Education: A Summary of Process, Best Practices, and Lessons Learned,” summarizes more than 20 articles on field-based education in operations research, management science, and related disciplines. Importantly, it identifies, based on their reporting in the literature, a common structure among these commonly unstructured courses for both future researchers to reference and future field-based instructors to consider in their course design. Furthermore, it captures best practices and lessons learned on the teaching of field-based research for both researchers and instructors to consider. This article sets the stage for new advances in field-based education as demonstrated by the following three articles of the special issue.

In her article “Leveraging Experiential Field Projects—Discovery Learning in a Master’s in Analytics Program,” Cheri Speier-Pero (2018) discusses the value of “field projects” for students entering a master’s in analytics program at Michigan State University. She points out

that inclusion of such a project at the outset of the program facilitates stronger development of and connections between a student’s skills, experiences, and analytics mind-set. She shares the significant challenges, learning processes, and successes, which are different from a capstone field project and which must be addressed to create a successful learning experience, gained from her five years’ experience since introducing this approach at MSU.

In her article “Effectively Engaging Industry Partners Within the Classroom,” Renata Konrad (2018) provides suggestions for engaging an industry partner within a classroom and improving the classroom project experience. Set up as a competition, the project design aims to develop students’ project-framing, data-management, and communication skills. She describes general considerations for field-based course projects and provides suggestions on how to address these issues. She shares student feedback and discusses lessons learned from student, faculty, and industry partner perspectives.

In their article “Are Our Students Prepared? The Impact of Capstone Pedagogical Approaches on Student Skill Development During Industry-Sponsored Fieldwork,” Renata Konrad, Adrienne Hall-Phillips, and Ana Vila-Parrish (Konrad et al. 2018) evaluate the impact of pedagogical approaches and fieldwork course structures on skill development and project success. They present a summary of an ongoing study focused on assessing engineering skills before and after fieldwork experience at two institutions with different course structures in their respective industrial engineering programs. With the goal of developing a framework for measuring the changes in students’ engineering skills during their capstone course and determining how these skills align with industry expectations as well as exploring how differences in capstone course delivery impact the capstone experience, the authors developed two assessment instruments, one that involves student self-assessment across a set of engineering skills and one with which the industry partners involved evaluate the same students’ engineering skills. The results of this case study inform educators on students’

perceived skill levels as well as industry expectations of a newly graduated engineer's performance across a range of skills deemed important for workplace success.

The work in the preceding papers combines to highlight a number of clear findings. First, although field-based learning courses are exceedingly challenging and risky, their returns to students, faculty, and industry partners seem to outweigh the costs and risks. Second, although there are many ways to structure such a course, which may depend on school, level of education, project size, and even geography, there are common best practices and lessons learned that can be leveraged across institutions. Finally, expanding the presence of field-based education and research will benefit the profession as well as our graduates.

I hope from this special issue of *INFORMS Transactions on Education* that both new researchers and

instructors alike will find new interest in this exceedingly valuable approach to bridging the gap between theory and practice of OR/MS and analytics, making the leap from academia and academic coverage to the workplace for our students and our faculty.

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