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Vocational Presence in an Academic Setting: The Teaching with Industry Model

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Abstract: *Students pursuing applied degrees often express their desire for learning experiences that help them transition from academic to professional settings. The Teaching with Industry (TWI) model is a course design that combines videoconferencing technologies with best practices in online instruction to support greater industry presence during class sessions. The following paper describes TWI design iterations that were used in an undergraduate course on construction management safety practices. The designs featured industry practitioners as co-instructors but used different classroom setups and configurations of videoconferencing technologies to support their activities. Configurations, as well as challenges and affordances of the TWI designs are described; implications for future TWI designs and practices are discussed.*

Keywords: hybrid learning, career-technical education, co-teaching, teaching presence, videoconferencing.

Certain disciplines taught in higher education, such as engineering and medicine, benefit dramatically from the presence of industry perspectives and voices in their curriculum. This issue is particularly crucial given that academic curricula in general largely lack "an integration of both industry and the academy" (Wright, Cushman, & Nicholson, 2002, p. 122). As such, instructors in these disciplines often seek teaching strategies and approaches that close the gap between traditional classroom instruction and the practical know-how that employers hope students can apply as they enter the workforce.

Education-to-work transitions are a difficult time for students to navigate, often in part because of the differences in expectations between the two domains (Grosemans & De Cuyper, 2021). This can be especially true of career and technical education (CTE) degrees. Much of what is expected and required in students of CTE degree programs may not translate easily into desired skill sets for employers. As such, university professors teaching applied or vocational subjects may often incorporate pedagogical strategies to aid students in developing desirable and necessary skills more effectively (Taylor & Killingsworth, 2014). In doing so, degree programs in Construction Management, like other applied CTE disciplines, strive to balance a combination of meaningful theoretical content in the classroom with guidance and insight from industry practitioners.

Industry presence in academic settings can lend verisimilitude to student teamwork and communication skills practice, particularly in the ways students develop strategies and behaviors to communicate effectively with clients and suppliers (Hirsch et al., 2002). Including industry

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collaborations in academic curriculum also encourages reflective thinking and increases problem-solving skills (Cox & King, 2006). As such, bring industry presence into academic settings has often focused on collaborations that involve varying degrees of professional participation, oversight, and/or assessment of project or problem-based learning activities. Finally, students tend to regard academic-industry curricular and instructional partnerships favorably, believing their academic experiences will be highly related to the real world and allow them to make more informed decisions upon graduation (Hirsch, Anderson, Colgate, Lake, Shwom, & Yarnoff, 2002).

We considered these key affordances to learning experiences in applied sciences education as our primary reasons for wanting to develop a sustainable approach to co-teaching with industry professionals in academic setting. We called this approach Teaching with Industry (TWI) to reflect our main pedagogical objectives. The following design case illustrates stages of planning, development, and implementation of TWI in an applied sciences education context.

TWI Planning and Development

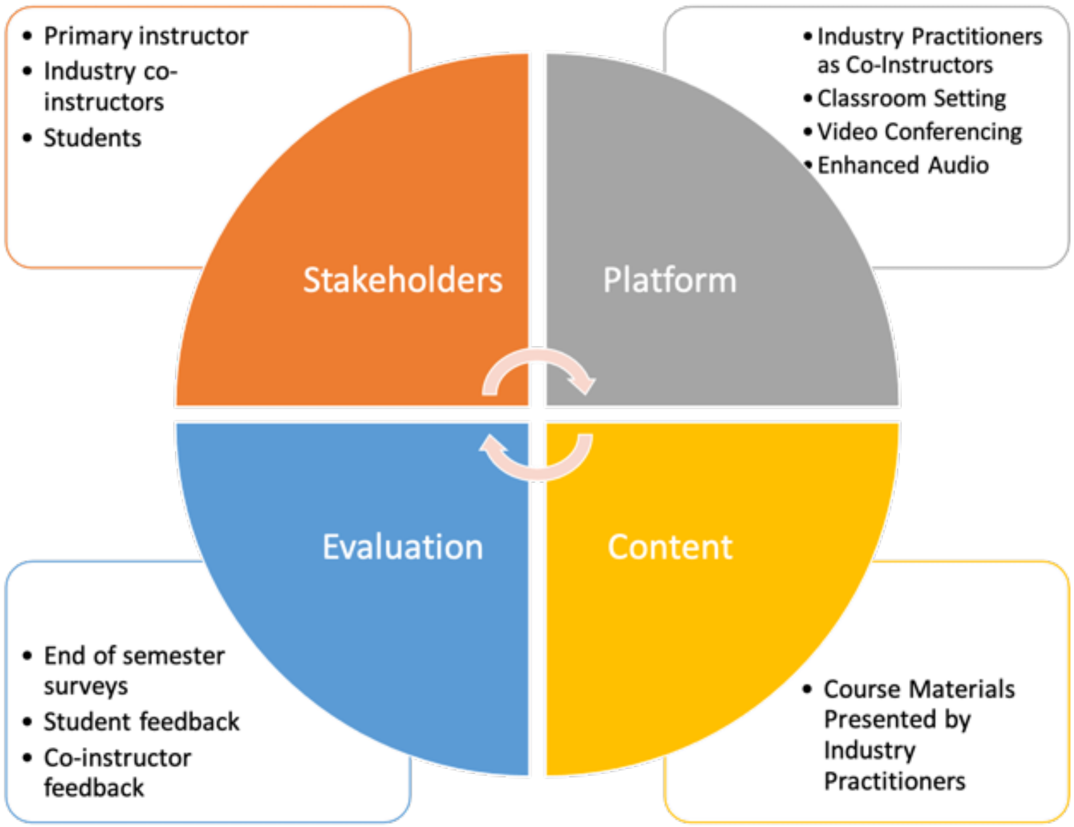
The context of this case is an undergraduate program in Construction Management at a land grant university in the western United States. Using exploratory survey results, we began our design of TWI by developing a simple framework which would establish our goals and help guide our design decisions and implementation procedures. Figure 1 shows a visual representation of the TWI framework highlighting major elements of our design plan. The framework illustrates 4 key elements we felt should guide our design for TWI. These elements naturally arose in our design discussions when we considered questions like, "Who would be involved?", "What technologies would we need?", "What would our content look like?", and "How would we measure our success and evaluate areas to improve?".

Our next step was to identify and enlist industry professionals in construction management who would be willing to participate. The program's Industry Advisory Board (IAB) helped identify qualified industry practitioners from different sectors (private and government) who could serve as co-instructors during a 16-week semester. These individuals were then contacted, introduced to the TWI concept, and invited to participate.

The industry practitioners were asked to agree to the following co-instructor expectations before committing to participation in the TWI course sessions:

- To review the course syllabus prior to the semester, and to provide input and recommendations.
- To be listed on the syllabus as co-instructors with their contact information (photo, website, email, and phone) available to all students in the class.
- To select two chapters from the course textbook related to their specific operating platforms in the industry.
- To provide the instructor with end of semester observations and course feedback.
    - To gain additional input on how to design and implement TWI, we reached out to a professor at a different university who teaches a similar course in construction management. Our goal here was to consult with peers on potential best practices, and to review topical content comparisons across the two course curricula. To provide visibility and recognition, TWI co-instructors were listed on the course syllabus cover page with their pictures and introduced to students at the beginning of the semester.

Figure 1
TWI Planning Framework



ENACTING TWI IN THE CLASSROOM

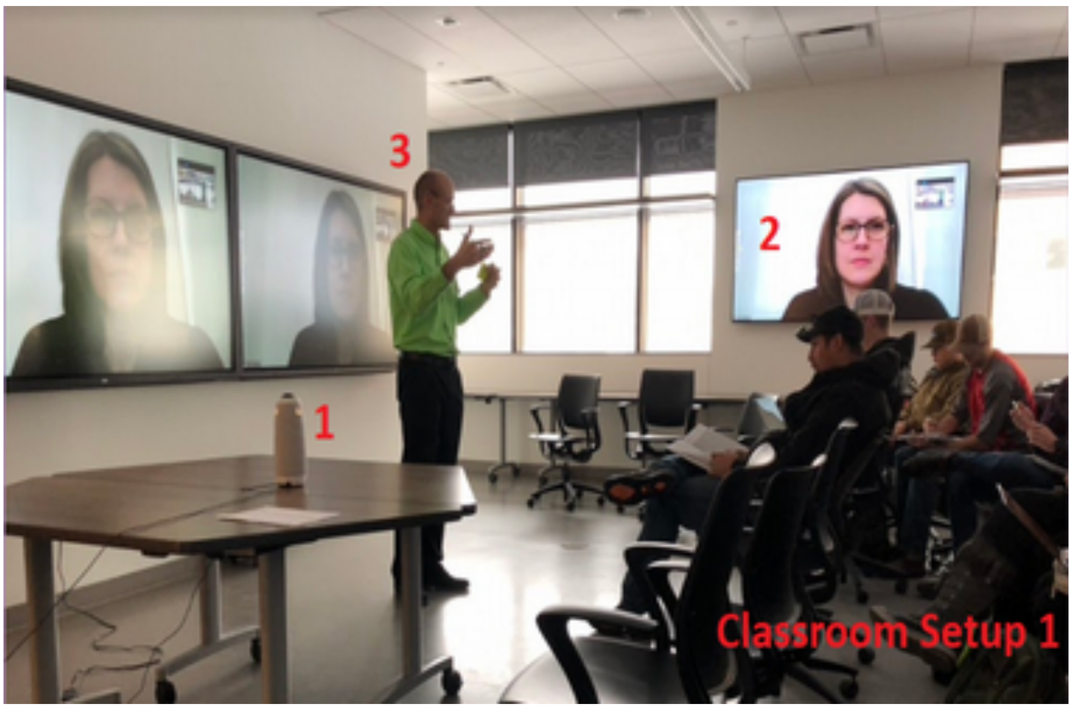
CO-TEACHER SELECTION AND TRAINING

As industry practitioners, the selected co-instructors were well established in their respective fields; some had prior experience teaching and presenting to undergraduate audiences. For practical and logistical reasons on both sides, however, we decided that the TWI approach should strive to use video conferencing technology as the primary means by which co-instructors would interact with the students. Our university is in a small rural town close to the Rocky Mountains, and most of the co-instructors were not living in the university area. While they had agreed to share their time and expertise, asking them to travel several hours or more (and potentially miss significant amounts of work in their professional jobs) was not practical or sustainable in the long term. As such, while our co-instructors were familiar with video conferencing, we recognized the need for additional training and support such as practicing with presentation software and transitioning from speaking (lecturing) to direct engagement (e.g., Q&A with students). This training was to ensure that the technology use would seem secondary to the actual presentation and engagement with the primary content and learning objectives.

TWI SETUP 1

Our first TWI setup took place in a classroom that had been recently equipped with multiple large monitors for sharing content around the room, as opposed to a single, central screen/monitor at the front of the room. This format not only allowed students to interact with the industry practitioner in real time via the Meeting OWL, but also allowed the industry practitioners to interact and engage through dialogue with students in real time. Figure 2 (with numbers) highlights the main features of this iteration setup. Figure 3 shows a symbolic topography of the setup established for digitally mediated learning (Bell, Sawaya, & Cain, 2014).

Figure 2
Main features of TWI Setup 1



Note. Object 1 is the Meeting OWL placed at the front of the classroom. Object 2 indicates the different monitors placed on walls around the room, as well as the co-instructor using Zoom to engage with the student audience. Object 3 indicates the presence of the primary instructor supporting the industry co-instructor during her presentation.

TWI SETUP 2

After our experience with Setup 1, we realized we would need to adjust and rethink how our technology worked in relation to the students in the room, as well as our intentions for engagement and learning. As such, Setup 2 featured students groups clustered around each monitor in the classroom. The industry practitioner was able to see and interact with the students in their respective group settings via the Meeting OWL. This format not only allowed the industry practitioner to deliver instruction from his/her industry location, but also allowed students to work and learn in group settings directed by the industry practitioner. Figure 4 highlights the main features of TWI Setup 2. Figure 5 shows the setup from a topographic perspective.

Figure 3
Symbolic topography of TWI Setup 1

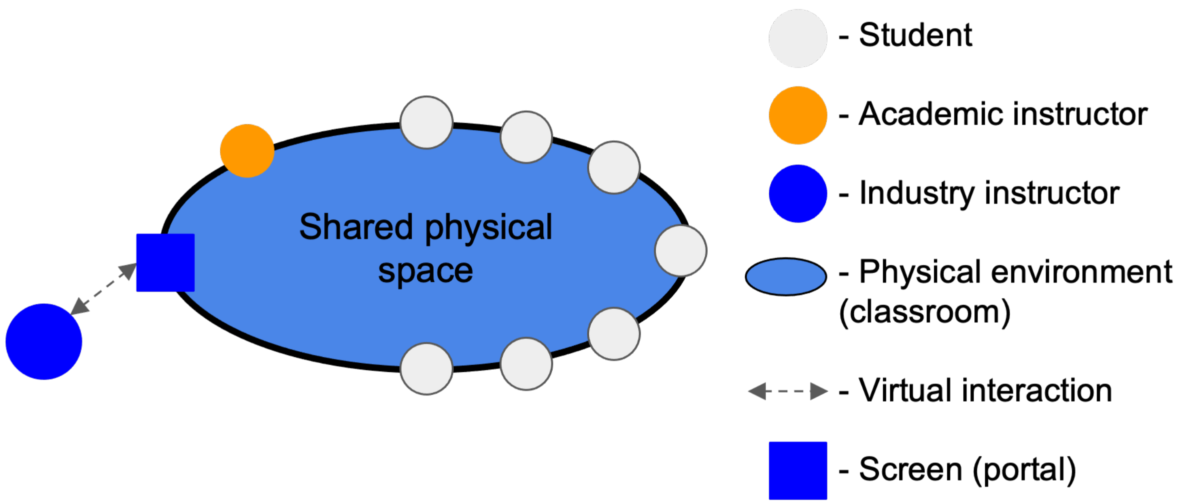
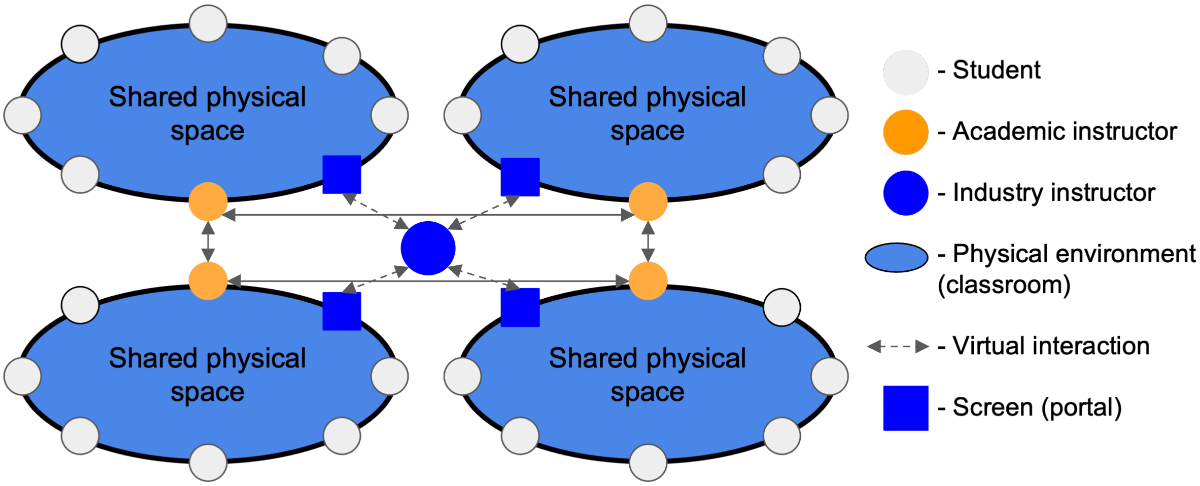


FIGURE 4
Main features of TWI Setup 2

Note. Object 1, the industry practitioner was displayed on 8 TV monitors in front of newly-formed student groups around the classroom.

Figure 5
Symbolic topography of TWI Setup 2



Conclusion and Future Directions

We conceived Teaching with Industry (TWI) as an extension of existing learning design practices used in applied fields to decrease gaps between real world and academic experiences. The above design case is meant to illustrate how a technologically-enhanced pedagogical approach such as TWI is planned for and implemented in a real-world classroom setting. Elements of the TWI approach, such as using video conferencing to host remote speakers for special presentations, have certainly been used in other course models and learning designs (Bell et al., 2014). However, the TWI model differs from the practice of simply inviting guest speakers for special presentations. The TWI model was designed with the express purpose of making industry presence in the classroom a regular feature of students' learning experiences. TWI attempts to standardize this practice by considering how industry professionals can work alongside instructors to curate and deliver learning experiences that bridge gaps in the transition from academia to industry. Future directions for TWI will include developing more precise protocols for content development and delivery, so that the mixed presence of in-class and remote co-teachers can seem more natural to students and their learning experiences. Future research will also focus on students expectations towards having greater industry presence in their academic environments and how these expectations can shape their overall perceptions of the value and utility of their learning experiences.

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