Project Unlock - A Journey to your New Industry Partnership Board

Lt. Col. Erik Carl Backus, Project Unlock

Erik C. Backus, PhD, PE, is a Professor of Practice at Clarkson University and the Howard E. Lechler Director of the Construction Engineering Management (CEM) program, teaching and supporting undergraduate, graduate, and other students and trainees. He has a bevy of expertise, experience, and knowledge in instructing project based engineering courses working closely with industry and community partners. Erik has spearheaded the Clarkson Civil & Environmental Engineering (CEE) Capstone design experience since 2015, using project teams as direct consultants with internal and external clients across the State and region. He has presented on one such project at the ASEE St. Lawrence Section conference on one such CEE capstone effort in the past. He also teaches courses in a variety of areas connected to both building and infrastructure construction. Previous to his time at Clarkson, he was an Assistant Professor of Military Science at George Mason University in Fairfax, VA and an Instructor/Writer for the US Army Engineer School USAES) at the Maneuver Support Center (MANSCEN), Fort Leonard Wood, MO. He was responsible for rewiring significant portions of the USAES Engineer Captain's Career Course curriculum related to construction contracting and is a past winner of the MANSCEN Technical Training Excellence award. Among his current efforts is being a leader in Project Unlock which seeks to transform advisory boards into partnership boards as a way to transform engineering education programs.

Jessica P.M. Fick, University of Wisconsin - Platteville
Dr. Jennifer S Atchison, Drexel University

Jennifer Atchison received her Ph.D in Materials Science and Engineering in 2012 from Drexel University. Dr. Atchisonâ€™s professional interests include nanofibrous textiles, engineering design, engineering education especially active learning, diversity,

Dr. Jagadish Torlapati, Rowan University

Dr. Jagadish Torlapati is currently a faculty at the Civil and Environmental Engineering Department at Rowan University in Glassboro. His primary areas of interest are environmental and water resources engineering.

Dr. Philip J. Parker P.E., University of Wisconsin - Platteville

Philip Parker, Ph.D., P.E., is Program Coordinator for the Environmental Engineering program at the University of Wisconsin-Platteville. He is co-author of the textbook "Introduction to Infrastructure" published in 2012 by Wiley. He has helped lead the

Dr. Jodi F. Prosise, University of Minnesota - Twin Cities

Jodi Prosise is Chair of Engineering and Physics and an Associate Professor of Industrial Engineering and Mechanical Engineering. She earned her PhD in Biomedical Engineering at University of Minnesota and her Bachelor of Science in Mechanical Engineerin

Project Unlock - A Journey to your New Industry Partnership Board

Abstract

Through a collaborative, co-created process, a distinct methodology has been developed, for moving what have been Industry Advisory Boards (IAB), into Industry Partnership Boards (IPB). A multi-institutional effort, supported by the Kern Entrepreneurial Engineering Network (KEEN); this method has already directly impacted institutions and engineering programs across the United States. Applied to over 40 Partnership Projects across 7 institutions of higher education, this paper will: a) discuss this method, b) provide an analysis of the impacts of the projects undertaken through its use, and c) provide case study examples of the conversion process from advisement to partnership within the engineering programs at select institutions. The Project Unlock Method™, coupled with the KEEN Entrepreneurial Mindset (EM) framework, provides a pathway for engineering programs to leverage the expertise and insight of industry in their programs and curriculum. By shifting IABs from reactionary advisory roles to active partnership roles, the approach demonstrates how academic-industry interactions can become more adaptive and impactful. This paper also shares current efforts from a Project Unlock ™ training involving over 15 institutions that have now committed to applying this method at their college or university. The paper concludes with an exploration of future avenues of this effort to transform higher educational engineering programs to build both the Entrepreneurial Mindset (EM); and enriching, resourcing, and enabling future engineering students in the years to come.

Introduction

Industry Advisory Boards (IABs) have been a staple of engineering academic departments and programs since nearly their inception [1]. With the advent of accreditation standards, particularly from ABET (formerly known as the Accreditation Board for Engineering and Technology), IABs have become a core aspect for engineering programs to demonstrate that they have incorporated the voice of their "constituencies" to support continuous improvement in the program curricula and influence student outcomes [2]. Traditionally, IABs consist of senior executives and seasoned professionals with a vested interest in the programs they are asked to advise [2]. IABs have traditionally served as sounding boards for faculty and administrators to seek advice and counsel about their programs, proposed alterations, or areas needing improvement [3]. However, this reactionary role, often limited to periodic visits, has relegated these boards to passive sounding boards with limited influence on program objectives and outcomes [1]. Project Unlock envisions not advisory boards, but Industry *Partnership* Boards (IPBs; emphasis ours). Unlike traditional advisory boards, IPBs engage partners as active participants in engineering programs. Beyond providing advice, IPBs work collaboratively with

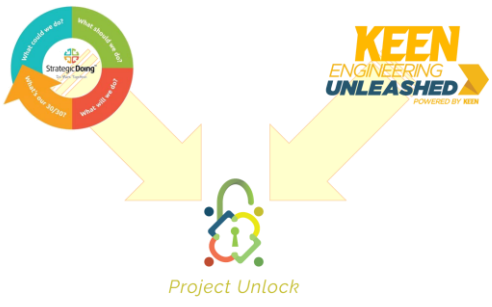

Figure 1 - Conceptual Development for Project Unlock

faculty and students to create projects that directly impact engineering education.

To facilitate this transformation from IAB to IPB, a group of faculty across various institutions, partnering with the Agile Strategy Lab and the Kern Entrepreneurial Education Network (KEEN), have developed the Project Unlock Method™ (Figure 1). This method engages IABs through a deliberate workshop and follow-on engagements which will be described in more detail later in this paper. The Entrepreneurial Mindset (EM), developed through KEEN is embedded throughout the process such that the workshop experience and the resulting partnership projects reflect EM learning objectives [4]. The goals and objectives of KEEN are directly interwoven into the transformation of IABs into IPBs. This alignment allows engineering programs to leverage the expertise and insights of industry to enhance student learning and preparation - by embedding curricular and co-curricular EM interventions. These interventions provide students with opportunities to practice the habits of dispositional curiosity, looking for connections, and ultimately creating value through their work. Students will see how engineers in practice apply dispositional curiosity to an ever-changing world, and make connections between disparate ideas, people, and places, to create value, not only monetarily but socially, interpersonally, ecologically, and intrinsically (Figure 2).

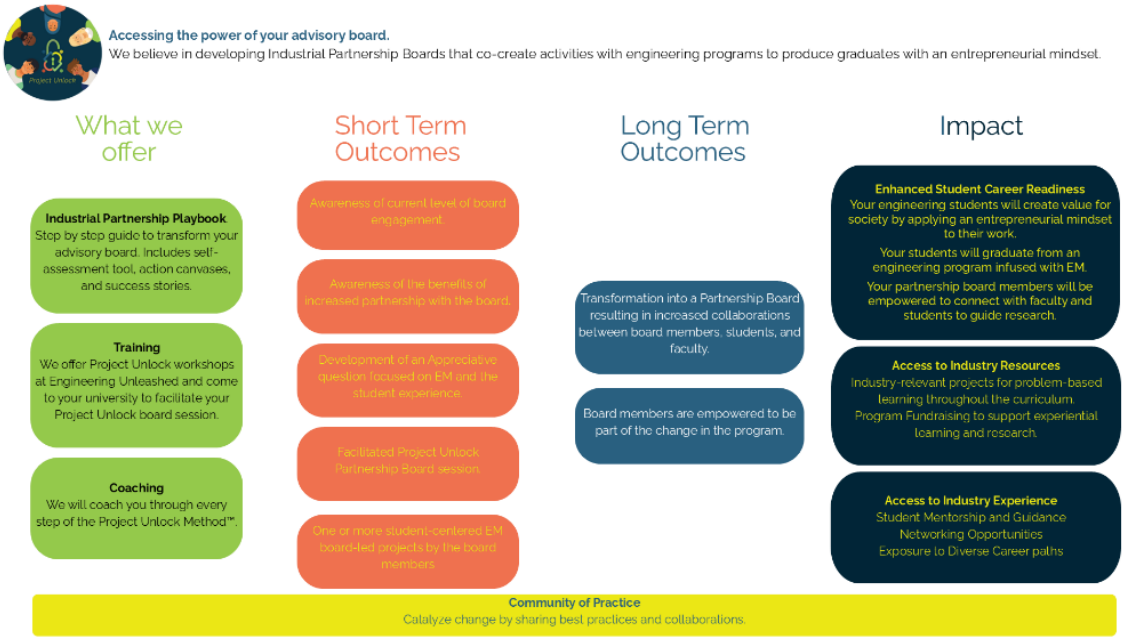

Figure 2. The theory of change for Project Unlock.

The Project Unlock Method™

Project Unlock offers an Industrial Partnership Playbook [5], training, and coaching to help participants prepare for a Project Unlock Method™ workshop in an Advisory Board Meeting (Figure 2). These offerings ensure that anyone who wants to transform their IAB into an IPB will have the materials and support needed for a successful workshop. The Project Unlock Method™ workshop is the catalyst for transformation and where the Partnership Projects will be envisioned. To prepare for a workshop we recommend participating in training to learn the

method and access coaching for your first workshop. The overall Project Unlock Method™ like Strategic Doing™ [6] is an iterative process so once your initial set of projects is executed you begin the process again mimicking the engineering design process.

The Project Unlock Method™ (Figure 3) is based on the rules of Strategic Doing™ and was collaboratively developed with the Agile Strategy Lab at the University of North Alabama as an approach to engage Industrial Advisory Boards more meaningfully and transform them into Industrial Partnership Boards. This approach is tailored to align more closely with the thought processes of engineers and other STEM professionals. Additionally, it strengthens connections between what the board does and student engagement with the Entrepreneurial Mindset.

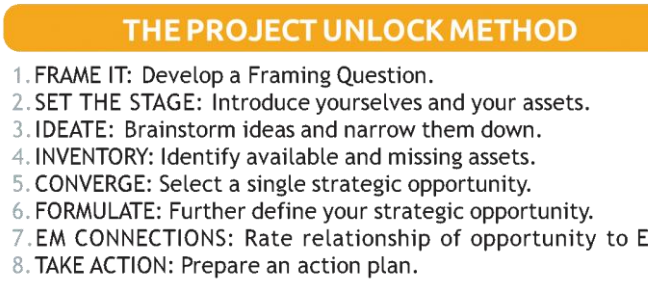

Figure 3. The steps of the Project Unlock Method

In a Project Unlock workshop, participants are guided through a structured dialog embracing equity of voice and timely decision-making. The workshop is focused on a carefully formulated framing question, developed by the advisory board leadership and Project Unlock coach. The participants follow the steps outlined in Figure 3. We are intentional about collecting assets that participants are willing to share so that no projects are selected that the board does not have the physical, skills, social, or capital assets to complete. This empowers participants to select a Partnership Project that they will develop collaboratively over the next year. Because this is a year-long commitment, participants must be ready and willing to commit to this ahead of the workshop. Once a project is selected, the participants create an action plan and decide when to meet again. The process and actions taken after the workshop are intended to encourage active participation and the building of trust among the group.

A successful workshop begins with a core team of 3-6 people that are enthusiastic and prepared to help guide all members of the board through the process. While everyone is equal, the core team will plan the workshop and serve as “chief nudgers” to keep the process moving. The core team will also help organize the teams that will develop Partnership Projects. There are several ways you can put teams together and how you do so will depend on your goals and their interests. Possibilities include: by discipline, by interest, by key assets, or by diversity of thought.

Following the workshop, the participants execute their action plans and provide regular updates during check-in meetings. It is critical that the team sets up a closed-loop feedback structure to ensure that the project reaches a conclusion. Usually, every 30 days a 30-45 -minute check-in meeting is scheduled to see what the team learned, what needs to change, and what will be next. After the conclusion of a project, the team may decide to take on another project, building on their previous successes.

The workshop and initial Partnership Project(s) are meant to build trust and a sense of accomplishment among board members. In some cases, projects fail because they are

incomplete, sometimes projects end up being amazing, and often projects end up leading to some noticeable improvements. In all cases, something is learned by completing a Partnership Project. Ultimately, while the Partnership Project is a tangible outcome of the process, it is not the only outcome. The most impactful outcome is the relationship building and network development that happens by doing the Partnership Project. Even when projects face challenges or fail, participants consistently report valuable insights and strengthened partnerships as key outcomes of the Project Unlock Method™.

Impact Analysis

Project Unlock was designed to help engineering programs transform their advisory boards into high-impact Industry Partnership Boards (IPBs) and was launched in 2021[7]. To date, we have conducted workshops with nine advisory boards, which have resulted in forty Partnership Projects, impacting more than 500 students and approximately 50 faculty and staff. Additionally, twenty institutions attended our 3-day summer Project Unlock Training and those participants are currently working with Project Unlock coaches to plan and implement their workshops.

The impact of this work extends beyond the numbers. Participating institutions regularly see a complete shift in the mindset and engagement of their board members, faculty, and staff, creating stronger engineering departments and programs that, in turn, create experiences for engineering students that are more focused on curiosity, creating value, and making connections.

The department chair from one large engineering program shared their experience with Project Unlock:

> "I wanted to share how valuable the Strategic Doing framework has been to me. I majorly reconfigured the department advisory board between last year and this year to give it some better strategic alignment with department direction. The new members loved the activities of working in groups to create projects right from the first day. We are continuing to advance stronger department faculty – industry/owner relationships, added a new initiative about creating buzz about civil and environmental engineering for potential students and designing a new first-year pathway for undecided students in sustainable infrastructure and energy… the inclusion of larger stakeholder groups, has been helpful for other department initiatives. There are teams of faculty working together to figure out how to integrate professional skills through current technical courses, as proposed in the revised curriculum we just passed. Through a series of working faculty meetings, I have been stepping the teams through the Strategic Doing visioning process. We are making great progress. I have also used the format to lead a 30-min brainstorming session with groups of students to provide more insight in how the department can meet them where they are at in terms of their needs for career preparedness. I think that all these initiatives ultimately create value in the engineering workforce because students will be better prepared to 'be' engineers."

This testimonial exemplifies how the Project Unlock Method™ fosters actionable strategies that transform the culture and nature of interactions between academia and industry.

As another example, here is what another quote from a recent Project Unlock participant:

> "[I w]ant to follow up on what we experienced on Friday. Palpable joy, generous collaboration and bold [what-if-ing]. Been thinking about how this process is about building a shared identity. Folks walk in kind of knowing each other but leave with a visceral understanding/pride of 'look who we are, the resources we have, and what we can imagine and create together! This is a powerful us. This is … us -- the ASU we -- [are] capable of.' Who wouldn't embrace the experience when it is framed with the understanding that 'You are here because you are special, game changers, and you have the resources (assets) and the experience/excitement/vision to change the game. We invite you to do just that. Dream big and we trust you to lead us through this change.' Your "doing" process builds both pride and ownership of possibility. So cool."

Our partners at the Agile Strategy Lab said, "Applying the Strategic Doing methodology to Industrial Advisory Boards (IAB) to lead the team to become an Industry Partnership Board (IPB) is an excellent example of how teams who do not report to each other, yet desire to work together, can achieve success. Using a culture of shared leadership as described in the book, "Strategic Doing: Ten Skills for Agile Leadership," teams can be more effective in highly complex situations. IPBs are collaborations that include many different constituents highlighting the need for new ways to collaborate and move the conversation from ideas to actions. The Agile Strategy Lab recognizes the work of Project Unlock as a game-changer for the impact that IPBs can have to further promote the engineering mindset and gain results that benefit all the participants in a collaboration". The next section will highlight some of the Partnership Projects as an illustration of the transformation process.

Example Detailed Case Study

The Mechanical and Industrial Engineering (MEIE) Department at the University of Wisconsin-Platteville began implementing the Project Unlock Method™ in 2022 with the goal of transforming its Industry Advisory Board (IAB) into an active and engaged Industry Partnership Board (IPB). The department sought to create meaningful collaboration between industry partners, faculty, and students while addressing key departmental priorities.

The first year of implementation introduced the Strategic Doing process, which brought together faculty and industry professionals to brainstorm and initiate projects aligned with the department's vision. Participants were divided into teams and tasked with addressing the framing question: "Imagine that Wisconsin-Platteville MEIE graduates exceeded their employers' expectations of how much value they create for their employer. How might we get there?" Four projects emerged from the workshop, ranging from an alumni survey to a hands-on Scrap Challenge for students. While two of the projects were moderately successful, challenges such as low participation and logistical issues highlighted the need for adjustments.

In 2023, the department convened the IAB for its annual meeting to reflect on the outcomes of the first year. This meeting marked a turning point. Board members shared constructive feedback on the process, noting that while the open, collaborative structure encouraged creativity, some aspects felt rushed, and objectives were not always clear. More importantly,

members expressed a desire for greater ownership of the projects. Previously, many industry participants felt they had to defer to faculty or staff for leadership. The structured process of Project Unlock, however, encouraged them to step into decision-making roles, leading to a significant cultural shift within the board.

This shift toward empowerment became a defining feature of the IPB. Members now felt confident calling meetings, making decisions, and driving progress, rather than waiting for university personnel to lead. This newfound sense of partnership not only strengthened the board's engagement but also created a more collaborative and dynamic environment for everyone.

The second year of Project Unlock brought new initiatives and refinements to the process. Teams launched three new projects: a Professional Mentorship Program to connect students with industry professionals, a Recruitment Plan to attract students to the Industrial and Systems Engineering program, and a case statement for an endowed professorship. At the conclusion of Year 2, project teams presented their progress during the annual in-person IAB meeting. Decisions were made about the future of each initiative, determining which projects to complete, continue, or retire. This structured reflection allowed for seamless reorganization of teams and the definition of new goals, ensuring that the IPB's work remained aligned with the department's priorities.

Now in its third year, the MEIE Department continues to refine and sustain its IPB initiatives. Two key projects—the Professional Mentorship Program and the Recruitment Plan—remain active. The mentorship program has expanded to include more students and mentors, fostering career readiness and professional growth. The recruitment plan has evolved to address regional workforce needs and attract new talent to the Industrial and Systems Engineering program. Regular check-ins and collaborative decision-making ensure that these initiatives maintain momentum and deliver meaningful results.

Through this process, the MEIE Department has witnessed a profound cultural shift within its advisory board. Industry partners now feel empowered to lead and take ownership of the projects they are working on, a transformation that has strengthened relationships and enhanced the overall impact of the board. The projects were also more focused on Entrepreneurial Mindset as they progressed as the realization that additional attention at key stages in the process could have a big impact on the final product and, in turn, the impact on the students. Three years into Project Unlock, the MEIE Department continues to demonstrate how intentional, structured collaboration can drive innovation and redefine the role of industry advisory boards in higher education.

Future Directions

Project Unlock has achieved significant success and learned a lot about IAB interactions with a limited number of engineering programs, yet much remains to be pursued. While the Project Unlock team has completed meaningful work with less than a dozen programs, there are many more engineering programs, departments, schools/colleges that have not engaged with the method. There is, therefore, room for further adoption of the method as well as learning insight

about the method's impact from those additional programs. The Project Unlock team has a long-term goal, a further transformation of the higher education landscape as it pertains to engineering education and beyond. As one member of the team has said repetitively, "capstone experiences for engineering education was transformational in its day, perhaps IPBs can be that next transformational movement that becomes so widely adopted that it become *the* way programs operate." This aligns with the wider transformation already underway through KEEN to transform engineering education through the Entrepreneurial Mindset, as undergraduate students engage with the industry and other partners with whom they will spend the rest of their careers interacting and partnering.

Conclusion

Engineering educational programs worldwide have relied on Industrial Advisory Boards (IABs) to provide external guidance and feedback. However, these boards often have limited, reactionary roles that fail to maximize their potential impact. By transforming IABs into IPBs through the Project Unlock Method™, engineering education can unlock opportunities for collaboration, co-creation, and innovation between academia and industry that has the potential to unleash resources, capacities, and transformation for the betterment of engineering education and engineering as a practice and industry for decades to come. This transformation requires additional iterations with more programs, departments, schools/colleges so as to bear out through further research and collaboration the potential that needs to be realized for the good of the students, the programs, the country and world at large.

References

[1] S. R. Genheimer and R. Shehab, "The effective industry advisory board in engineering education - a model and case study," in *2007 37th annual frontiers in education conference - global engineering: knowledge without borders, opportunities without passports*, Milwaukee, WI, USA: IEEE, Oct. 2007, pp. T3E-6-T3E-12. doi: 10.1109/FIE.2007.4418027.

[2] Dr. S. R. Genheimer and Dr. R. L. Shehab, "A Survey of Industry Advisory Board Operation and Effectiveness in Engineering Education," *Journal of Engineering Education*, vol. 98, no. 2, pp. 169–180, 2009, doi: 10.1002/j.2168-9830.2009.tb01015.x.

[3] E. Backus, P. Dougall, S. Rogers, J. Atchison, J. Rogers, and P. Parker, "Board 50: Unlock the Potential of Industry Partners for Engineering Education," in *2023 ASEE Annual Conference & Exposition Proceedings*, Baltimore , Maryland: ASEE Conferences, Jun. 2023, p. 42834. doi: 10.18260/1-2--42834.

[4] "The KEEN Framework | Engineering Unleashed." Accessed: Jan. 15, 2025. [Online]. Available: https://engineeringunleashed.com/framework

[5] J. Prosise, Ed., "Chapter 1, What is an Industrial Partnership Board and why do I need one?," in *The Project Unlock Industrial Partnership Board Playbook*, First., Self Published, 2024, p. 9. Accessed: Jan. 15, 2025. [Online]. Available: https://drive.google.com/file/u/0/d/1dOUW-4UiBLhhvQxdjFY0PJbT8OnmX62p/view?usp=embed_facebook

[6] E. Morrison, *Strategic Doing*. Newark: John Wiley & Sons, Incorporated, 2019.

[7] J. Torlapati, J. Prosise, P. Parker, K. Jahan, and M. Smith, "Building Action-Oriented Collaborations with Industry Advisory Boards to Promote Entrepreneurial Mindset Learning

(EML),” in *2023 ASEE Annual Conference & Exposition Proceedings*, Baltimore , Maryland: ASEE Conferences, Jun. 2023, p. 43072. doi: 10.18260/1-2--43072.