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SPARKING INNOVATION

IN CIVIL ENGINEERING EDUCATION

FINAL REPORT

2025 ASCE Civil Engineering Education Summit

2025

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SPARKING INNOVATION IN CIVIL ENGINEERING EDUCATION

2025 ASCE EDUCATION SUMMIT REPORT

Executive Summary

The 2025 ASCE Civil Engineering Education Summit, held June 10–12 at Case Western Reserve University in Cleveland, Ohio, brought together more than 125 leaders from academia, industry, and professional organizations to advance innovation in civil engineering education. Organized by the ASCE Innovations in Civil Engineering Education Working Group (ICEE WG) within the Committee on Education (COE), the Summit fostered collaboration to address evolving technical and professional skill demands, provided change management strategies, and developed robust outreach approaches to inspire the next generation of civil engineers.

Figure 1. Summit Participants Engaged with Presenters

Summit Objectives

The conference centered on three overarching objectives:

- **Identify the Top 5 Essential Professional Skills** needed for the future workforce.
- **Define the Top 5 Critical Technical Skills** to leverage emerging technologies for innovation and problem-solving.
- **Develop the Top 5 Engaging Outreach Strategies** to attract and scale the next generation of civil engineers.

Program Highlights

The Summit featured a dynamic mix of keynote sessions, rapid-fire technology briefs, interactive panels, and targeted workshops. Industry and academic experts addressed trends in areas such as AI, digital twins, IoT for smart cities, advanced materials, and sustainable infrastructure. Workshops explored professional skill gaps—ranging from communication and self-awareness to leading multidisciplinary teams—and technical needs, including automation, advanced modeling, and climate resilience strategies.

An **Outreach Hackathon** engaged participants in designing innovative, audience-specific activities for K–12 students, educators, and guidance counselors. Ideas spanned hands-on classroom kits, VR field trips, mentorship programs, and social media campaigns, aimed at breaking stereotypes and highlighting the real-world impact of civil engineering. Presenters also engaged participants in how to influence modernizing civil engineering curricula through the 4th edition of the Civil Engineering Body of Knowledge and accreditation criteria.

Converging on Priorities (5-5-5)

Top 5 Professional Skills

1. **Communication** – Developing clear, concise, and audience-appropriate communication across written, oral, and visual formats. Should be embedded throughout the curriculum with practice in technical, collaborative, and public-facing contexts.
2. **Business Skills** – Applying business principles such as finance, budgeting, marketing, and entrepreneurship, with capacity for negotiation and conflict resolution. Integrated through project management, cost analysis, and risk assessment experiences.
3. **Teamwork** – Building the ability to work effectively in diverse, multidisciplinary teams, including collaboration, conflict resolution, and shared decision-making. Embedded across the curriculum with increasing complexity over time.
4. **Time Management** – Strengthening the ability to prioritize tasks, meet deadlines, and balance competing demands. Introduce early in the undergraduate program and reinforce through project-based learning.
5. Tie between **Creativity** – Cultivating innovative problem-solving while fostering adaptability, and **Resilience** - persistence in the face of setbacks. Both would be integrated into design courses, interdisciplinary challenges, and experiential learning.

Top 5 Technical Skills

1. **AI in Civil Engineering Practice** – Integration of AI into practice, including ethics, quality control, and verification. Begin introducing concepts in the first two undergraduate years, with advanced application later.
2. **Working with Uncertainty** – Addressing parameter variability, modeling limitations, extreme events, and safety factors. Recommended for upper-level undergraduate and graduate instruction with immediate integration.
3. **Sensing** – Verification of collected data and evaluation of its reliability. Introduce in the first two undergraduate years – another urgent need.
4. **User-Centered and Universal Design** – Expanding tools and training for faculty and developing faculty champions. Increasing cross-disciplinary collaboration beyond engineering to improve accessibility and inclusivity in design. Embedded throughout the undergraduate curriculum.
5. **Visualization for Communication and Concept Development** – Leveraging visual tools to convey ideas and refine designs, introduced early in the curriculum (possibly before college).

Top 5 Outreach Strategies

1. **ASCE Civil Engineering Summer Camps for High School Students** – Immersive, multi-day experiences introducing CE concepts and careers, built through university–industry partnerships and long-term mentorship.
2. **Immersive Toolkits and Paid Professional Development for K–12 Teachers and Guidance Counselors** – Equips educators to integrate CE into classrooms, multiplying impact through sustained use of high-quality materials.
3. **ASCE YouTube & Digital Media Channels for Students** – Delivers engaging short-form videos, challenges, and influencer content to inspire interest across all age groups.
4. **Industry-Sponsored Internships and Dual Enrollment CE Courses for High School Students** – Combines real-world experience with early academic engagement, strengthening the CE talent pipeline.
5. **3D Printing and Hands-on Build Activities (All Levels)** – Engages learners through creative, tangible projects adaptable to any age, integrating technology and design thinking.

Change Management Focus

A distinctive element of the 2025 Summit was its series of **Change Management Workshops**, facilitated by Julia Williams, author of *Making Changes in STEM Education: The Change Maker's Toolkit*, which were designed to move participants from vision to action. These sessions provided tools for developing shared change goals, building industry–academia partnerships, and creating actionable implementation plans. Through this process, attendees made **39 formal commitments to change**, each aligned with the Summit's three objectives. Commitments included curricular redesigns, expanded industry collaborations, targeted outreach programs, and integration of emerging technologies into coursework. The full list is below.

- Data-Driven StoryTellers
- AI in the Curriculum
- Tech-Integrated CEE Classes
- Architectural Engineering Engagements Early in the Curriculum
- Bringing Industry to Campus
- Integrating Social Responsibility across the Curriculum
- Data Sensing, Robustness, and Resiliency Course
- Promoting Civil Engineering in Rural High Schools
- Shifting from Transactional Thinking with Local Universities
- Developing Tomorrow's Leaders
- Overhaul CE Curriculum
- Shared Vision for Lab Structure
- Integrate AI Into the Curriculum
- Defining and Addressing Student Competencies (Adaptation and Uncertainty)
- Assessing Curriculum and Student Outcomes (Tech and Prof Gaps)
- Design Projects Guided by Practicing Engineers
- Internal Branding and Profile of CEE
- New Building as Catalyst for Reimagining CE Groups, Focus on Engr Equity, Alumni
- Incorporate AI into Curriculum
- Industry/Student Group Outreach Partnership, Incorporating AI
- Revolutionize the Engineering Technology Department with Professional Skills
- BuiLDing a Sustainable Recruitment Pipeline
- Integration of AI Concepts, Tools, and Applications
- Curriculum Change Towards AI & Technology
- Filling Technical and Professional Skill Gaps in Student Outcomes
- Introduce Professional Skills and AI into the Curriculum
- Updated CIT-E Forum for Professional Skills in partnership with ASCE and ACEC
- Rebrand Communication as Professional Formation and Integrate into Elective Requirements
- Include AI/Data Fluency/Machine Learning Course in the Curriculum
- Create a Nimble, Transdisciplinary Degree Program Focused on Sustainable and Resilient Infrastructure and Society
- Strengthen and Develop New Industry Partnerships to Encourage Pipeline
- Communicating WITH differing Audiences, Giving and Receiving Feedback
- Update Foundational EDSGN 100 as an Attractor Course
- Engage New CE Majors with Hard Hat Ceremony and Co-Curricular
- Improve Collaborative Mutually Beneficial Partnerships for Projects and Outreach
- Recruit through Outreach to Local Schools
- Engage Professional Skills in Senior Design and Include AI/Sensors
- Implement Future World Vision
- Offer Project-Based CAD/Surveying/GIS Course with Local Surveyors

Next Steps

Following the Summit, the ICEE Working Group will host targeted follow-up workshops to support participants in executing their commitments to change. These sessions will provide guidance on resource identification, partnership development, and progress evaluation, ensuring that ideas generated during the Summit translate into measurable, lasting improvements in civil engineering education and outreach.

Outcomes & Impact

The 2025 Education Summit successfully:

- **Built consensus around critical skill gaps and outreach needs for the profession.**
- **Strengthened collaboration between academia and industry to accelerate change.**
- **Generated a portfolio of innovative, scalable outreach and educational strategies.**
- **Established a network of committed change leaders who will continue to drive progress well beyond the conference.**

By fostering shared ownership of the profession's future, the Summit reinforced ASCE's commitment to preparing civil engineers to lead in a rapidly evolving, interconnected world.

Figure 2. Professional Skills Panel Discussion

Resources

The 2025 ASCE Civil Engineering Education Summit Program with linked slides, posters, and workshop materials can be found at the following link, or you can use the QR code to access the files. **https://bit.ly/2025ASCEEdSummitReport**

Special Thanks!

As Chair of the Innovations in Civil Engineering Education (ICEE) Working Group, I extend my sincere appreciation to our entire committee for generously sharing your expertise, ideas, and energy throughout the past two years in preparation for the Summit. It has been a privilege to work alongside such a dedicated and creative team. I am especially grateful to several members who took on key roles as session leads, survey collectors, and co-authors of this report—**Edwin Nagy, Derin Ural, Juan Caicedo, Andrew Ramsburg, Joel Sloan, Camilla Saviz, CJ Bolding, and Leslie Nolen.** Your leadership, insights, and hard work were instrumental in shaping both the Summit experience and this final report. Thank you all for your outstanding contributions!

Regards,
Jennifer Ogle

Top 5 Professional Skills Summary

Objective 1: Identify the Top 5 Essential Professional Skills needed for the future workforce.

Process

The identification of the top professional skills gaps at the Summit began with the **Professional Skills Panel**, which brought together academic and industry leaders to share concise, high-impact perspectives on the evolving professional formation of civil engineers. Panelists highlighted a range of essential skills needed to meet the demands of a changing profession, including leadership and reflection (Adjo Amekudzi, Georgia Tech), interdisciplinary development (Achintya Bezbaruah, North Dakota State University), curricular integration of professional competencies (Allison MacKay, Ohio State University), social responsibility and equity-focused education (Freddy Paige, Virginia Tech), and embedding professional formation throughout the curriculum (CJ Bolding, Clemson University). Each presentation offered practical strategies and real-world examples, sparking a lively Q&A session on aligning educational experiences with industry expectations. The discussion emphasized the importance of communication, self-awareness, ethical decision-making, and the ability to lead multidisciplinary teams—skills viewed as equally critical as technical expertise for the future civil engineering workforce.

Building on these insights, participants moved into an **interactive workshop** to collaboratively define the top five professional skills gaps in civil engineering, with a focus on reconciling industry needs with current educational offerings. The session began with a brief networking activity, encouraging attendees to change tables, meet new colleagues, and share something they were grateful for.

Using an **affinity diagram** process, participants first engaged in idea generation, working individually to write one skill gap per sticky note before sharing ideas within their table groups. New skills were added as discussions evolved. In the clustering phase, all sticky notes were posted on a wall and organized through three rounds: silent grouping by one set of participants, discussion-based grouping by a second set, and titling of each cluster by a third set. This method encouraged broad participation and the integration of diverse perspectives.

Figure 3. Summit Participants Mesmerized by the Overwhelming Response to the Communication Gap

Outcomes

Once the affinity maps were fully developed, the participants had a chance to walk around and review before voting. By the number of post-its shown in Figure 3, communication skills were identified as the most significant skills gap. The vast number indicates each participant had at least one-to-two communication skill entries. Similarly, business skills also received significant votes. Finally, the summit participants voted on the skills (beyond communication and business skills) that they believed were most critical. The highest-ranked skills were **communication** (100%), **business skills** (60%)**, teamwork** (48%), **time management** (44%), and tied for 5th place are **creativity** (40%), and **resilience** (40%). Moderate responses were given for leadership (37%), professionalism (36%), and interpersonal skills (31%), followed by moral responsibilities (16%), and internal/external awareness (12%). While the exercise produced a ranked list, it also revealed the interconnected nature of these skills, reinforcing that professional competencies are best developed in an integrated, cross-cutting manner throughout the curriculum.

These results provided the foundation for refining the Top Five Professional Skills Gaps for civil engineering education, ensuring that graduates are prepared not only to solve complex technical problems but also to collaborate effectively, adapt to changing conditions, and lead with integrity in diverse professional contexts.

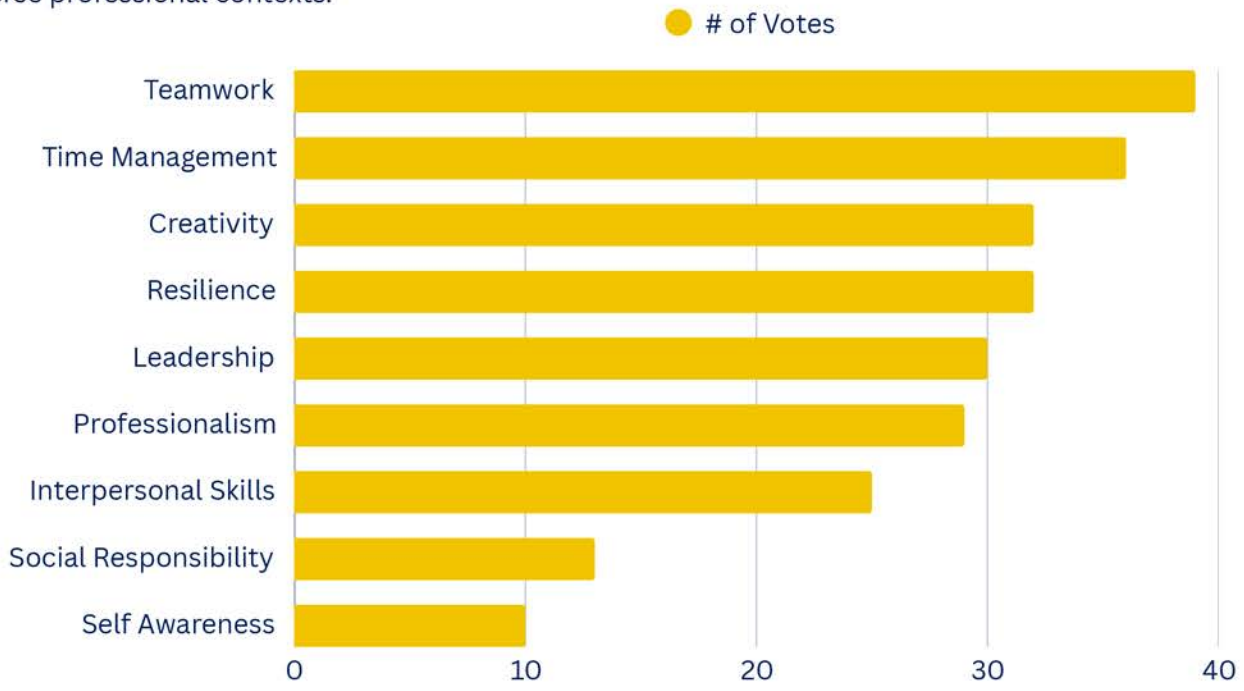


Figure 4. Beyond Communication - Summit Participants Submitted 3 Votes each for Top Professional Skill Gaps

Observations

While the professional skills workshop produced a clear set of top-ranked skills, several observations emerged from the process. The **concurrent (and well-attended) workshop on social responsibility, led by ASCE's MOSAIC team, may have influenced the results.** Social Responsibility was anticipated to be a prominent outcome of the affinity mapping exercise, but may have been underrepresented due to the parallel session. Additionally, some skills identified, such as interpersonal skills and internal/external awareness, are correlated. Strong interpersonal skills often depend on internal/external awareness, and an alternate title of relationship intelligence may allow these topics to be combined in future discussions. Finally, leadership, although ranked highly as a professional skill, was also a significant theme in the technical skills conversations, underscoring its cross-cutting importance across both domains of civil engineering education.

Top 5 Technical Skills Summary

Objective 2: Define the Top 5 Critical Technical Skills to leverage emerging technologies for innovation and problem-solving

Process

The Summit featured a series of Rapid-Fire Technical Skill Briefs, offering concise, high-energy presentations on emerging technologies shaping civil engineering practice. Topics included 3D printing for field engineering, AI-driven digital twins, transmission infrastructure challenges, data science applications, machine learning for performance evaluation, industry technology innovations, and the Internet of Things for smart cities. These snapshots provided attendees with a fast-paced overview of cutting-edge tools and trends, sparking discussion on how to integrate them into both education and practice.

The technical skills gap exercise was conducted over three days, using a highly interactive approach.

- **Day 1**: Participants individually brainstormed ideas on Post-it notes, which were grouped into 15 skill categories.
- **Day 2**: Attendees self-selected into category teams or a "wild card" group. Each team developed a poster to promote their skill gap, completed a "report card" answering key questions—when the skill is needed, when it should be taught, what it promotes, and its disciplinary alignment—and presented their case. The posters were hung around the room. Participants used Post-Its to leave notes and vote for their priority concepts.
- **Day 3**: Voting results from Day 2 were shared, and participants cast final votes for their top three skills from the leading 13 categories via an online platform.

Figure 5. Ideas Collected on Post-Its

Figure 6. Creating Posters Championing Skills Gaps on Day 2

Figure 7. Voting on Posters on Day 3

Outcomes

On Day 2, the group conducted a quick poll after the poster presentation session, which produced the following outcomes. AI was a clear standout, but several categories were nearly equal, and there were noticeable overlaps in topics such as file type knowledge and file management systems. Other topics, like leadership, were shared with the professional skill session. Further, time constraints limited the detailed definition of competencies and learning outcomes. However, the team convened overnight to refine the words and categories to allow for a vote on the last day.

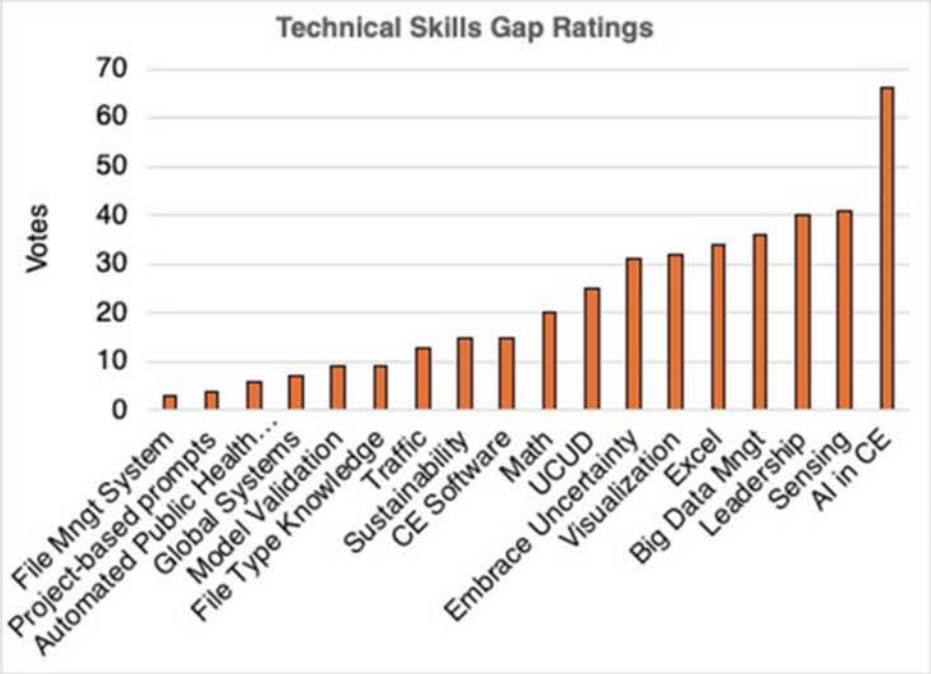


Figure 8. Initial Voting on Technical Skills Gaps

On Day 3, the full group revisited the voting to identify the final Top Five Technical Skills Gaps which included:

1. **AI in Civil Engineering Practice** – Integration of AI into practice, including ethics, quality control, and verification. Begin introducing concepts in the first two undergraduate years, with advanced application later.
2. **Working with Uncertainty** – Addressing parameter variability, modeling limitations, extreme events, and safety factors. Recommended for upper-level undergraduate and graduate instruction with immediate integration.
3. **Sensing** – Verification of collected data and evaluation of its reliability. Introduce in the first two undergraduate years – another urgent need.
4. **User-Centered and Universal Design** – Expanding tools and training for faculty and developing faculty champions. Increasing cross-disciplinary collaboration beyond engineering to improve accessibility and inclusivity in design. Embedded throughout the undergraduate curriculum.
5. **Visualization for Communication and Concept Development** – Leveraging visual tools to convey ideas and refine designs, introduced early in the curriculum (possibly before college).

Observations

While participation was strong, representation skewed toward academia; further industry input is needed to ensure comprehensive alignment with practice needs.

Top 5 Outreach Strategies Summary

Objective 3: Identify the top 5 outreach strategies to attract the next generation of civil engineers

Process

As part of the ASCE Education Summit, the Build the Future: Civil Engineering Outreach Hackathon brought together faculty, undergraduate and graduate students, and industry partners in an intensive, collaborative event to design innovative outreach strategies for attracting the next generation of civil engineers. Teams were instructed to include at least one industry professional and a mix of academic perspectives.
The hackathon centered on three overarching goals:

1. **Mapping the Field of Possibility** – identifying untapped audiences such as K–12 students and teachers, guidance counselors, community colleges, career-switchers, and underrepresented communities, while leveraging partnerships with industry, government, and STEM programs.
2. **Defining Compelling Messaging** – presenting civil engineering as a diverse, technology-driven profession with vast opportunities in sustainability, smart cities, climate resilience, and transportation innovation.
3. **Creating Pathways for Engagement** – proposing mechanisms such as mentorship programs, competitions, internships, and networking events to connect students with the profession.

Each team was assigned a target audience—ranging from elementary students to high school seniors, to teachers and guidance counselors—and tasked with creating a unique outreach initiative tailored to that group. Ideas included hands-on classroom activities, interactive games, VR field trips, social media campaigns, teacher training modules, and affordable classroom kits. Teams were encouraged to integrate storytelling, role models, and emerging technologies to inspire interest in civil engineering.

Final pitches were evaluated for their creativity, impact, feasibility, engagement, and presentation quality. The event produced a portfolio of practical, high-impact outreach ideas that can be adapted for national use, strengthened partnerships between academia and industry, and showcased the power of collaborative innovation in advancing the civil engineering profession.

In addition to this event, several outreach program videos were also submitted prior to the conference, and the audience voted for their favorite.

Figure 9. Brainstorming Engaging Outreach Strategies

Outcomes

The fan favorite outreach video from the online submittals went to **Bolton & Menk** for their children's book series featuring Walter the Raindrop, Will the Civil Engineer and related jobs like planner and GIS specialist.

Figure 10. Bolten & Menk Childrens' Books

Georgia Tech and UC Berkeley also submitted amazing promotional videos about CE opportunities in higher ed that made us all jealous.

While many strategies were crafted amongst the group during the Hackathon, there were a few that rose to the top when considering outreach strategies that could be realized with ASCE support, including:

1. ASCE Civil Engineering Summer Camps for High School Students

- Offer immersive, multi-day exposure to CE concepts and careers.
- Build strong pipelines into college engineering programs – partner with industry and Universities.
- Encourage long-term engagement and mentorship.

2. Immersive Toolkits and Paid Professional Development for K–12 Teachers and Guidance Counselors

- Empower educators to consistently integrate CE topics into classrooms.
- Multiplies outreach impact through educator influence over many students.
- Sustainability: once trained, teachers can use materials for years.

3. ASCE YouTube & Digital Media Channels for Students

- Meet students where they already are—on digital platforms!
- Short-form videos, influencers, and challenges attract broad participation.
- Can be used across all age groups for awareness and inspiration.

4. ASCE facilitated/Industry-Sponsored Internships and Dual Enrollment CE Courses for High Schools

- Provides real-world experience and career visibility.
- Strengthens the CE talent pipeline and motivates academic performance.
- Encourages collaboration between schools, universities, and industry.

5. ASCE facilitated Development of 3D Printing and Hands-on Build Activities (All Levels)

- Engage students through creativity and tangible learning.
- Scalable and adaptable to age levels (bridges, Mars habitats, etc.).
- Integrates technology and design thinking.

In addition, participants emphasized the value of creating an **ASCE mascot** to foster early recognition and enthusiasm for Civil Engineering. Additional outreach strategies, particularly those well-suited for collaboration between academia and industry, are available in the online archive.

Change Management Workshops - From Vision to Action

The 2025 CE Education Summit brought together academics and industry partners to reimagine the future of civil engineering education. Throughout the program, active sessions were designed to help participants develop specific, actionable plans for change at their home institutions. While the exercises used hypothetical prompts—"What is one change you would like to make in a specific area?"—the process provided a practical scaffold for implementing real innovations in CE education.

The summit opened with a working lunch, where participants engaged in guided conversations envisioning the future of CE education. The first set of prompts asked them to imagine it is 2040 and CE education is thriving—what does learning look like, especially regarding technical skills and industry engagement? The second set asked them to step back to the present to identify assumptions or traditions that could hinder that future vision. The purpose was not detailed outcomes, but to set the stage for three embedded change management workshops led by Dr. Julia M. Williams, Professor Emeritus at Rose-Hulman Institute of Technology and author of *Making Changes in STEM Education*.

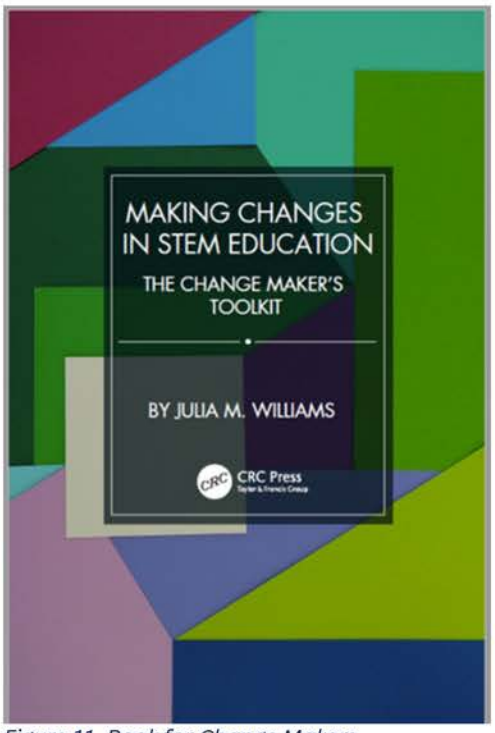


Figure 11. Book for Change Makers

Session 1: Laying the Foundation for Change

Participants developed a vision for change grounded in the needs of both industry and academia. The process began with a needs assessment, followed by reflection on why the change is needed now, prior efforts in the area, and perspectives from key stakeholders. The session concluded with creating a communication plan outlining the change, its timing, and rationale. Key lessons included identifying stakeholders, viewing change from their perspective, finding mutual benefits, and developing strategies for engagement.

Session 2: Bridging the Gap Between Industry and Academia

This session focused on building strategic relationships to support change. Participants brainstormed needs and potential partners, then created partner maps to visualize reciprocal value. They developed communication plans that linked challenges and opportunities across partners, emphasizing clear issues, core actions, and value propositions aligned with stakeholder interests.

Session 3: Convergence Workshop (5-5-5)

In the final session, participants outlined steps to implement the changes they had developed. They defined the change, identified potential partnerships, set three to four specific goals, and built action plans with assigned responsibilities and timelines. Each participant shared their commitment through a poster and brief presentation.

Outcomes

The summit concluded with **39 change commitments** submitted. These commitments spanned the summit's three overarching objectives, demonstrating strong engagement and a shared dedication to advancing civil engineering education.

Change Commitments: What Summit Teams Will Do This Year

Summit participants submitted **39 concrete commitments** aimed at accelerating change across curricula, student experience, and industry engagement. A large share target **technology-forward curriculum shifts**, with an especially strong emphasis on AI and data fluency. Teams proposed inserting AI concepts, tools, and applications early and often, alongside tech-integrated CEE classes, data sensing/robustness/resiliency, and project-based CAD/Surveying/GIS. Several departments will pursue program-level redesigns—from a full CE curriculum overhaul to standing up a nimble, transdisciplinary degree focused on sustainable and resilient infrastructure. Together, these efforts move beyond one-off tools to bake digital competency and systems thinking into the core.

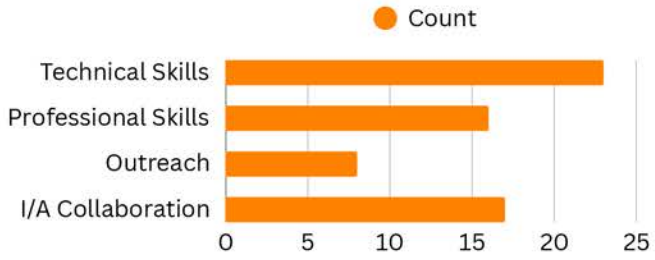


Figure 12. Distribution of Change Strategies

A second cluster concentrates on **professional formation**—the skills that help graduates lead, collaborate, and communicate in real contexts. Projects include rebranding "communication" as professional formation (and making it a requirement), introducing professional skills across the curriculum, assessing student outcomes for technical and professional gaps, developing tomorrow's leaders, and engaging professional skills in senior design. Communication projects were often paired with aI concepts. Several teams will modernize gateway experiences to set the tone early—updating the foundational design course to be an attractor course and launching a "hard-hat" ceremony with co-curriculars to build identity, expectations, and momentum from day one.

A third set of commitments focuses on **outreach and pipeline development**—meeting learners earlier and more equitably, and making the profession visible. Examples include promoting civil enginering in rural high schools, recruiting through local school outreach, building a sustainable recruitment pipeline, and data-driven storytellers to translate civil engineering's impact for diverse audiences. Some teams will pair outreach with curriculum—industry/student-group partnerships that incorporate AI and communication initiatives for giving/receiving feedback with differing audiences—so the same assets that attract students also strengthen in-program learning.

Finally, many projects hinge on **industry/academia collaboration** to ensure authenticity and scale. Departments will bring industry to campus, design projects guided by practicing engineers, and strengthen new partnerships to power both projects and outreach. Others plan structural enablers: an updated forum for professional skills with ASCE/ACEC, and shifting from transactional to strategic university partnerships. Several commitments explicitly integrate collaboration into tech workstreams (e.g., AI in curriculum + industry partnership), tightening the feedback loop between emerging tools and practice.

Cross-cutting themes emerged across the portfolio:

- **AI everywhere** (not just a course): multiple teams will spiral AI from intro to capstone, pairing adoption with ethics, verification, and quality control.
- **Early and often**: many efforts start in the first two undergraduate years—foundational courses, identity-building rituals, and introductory design with real partners.
- **Integrated assessment**: several groups will map competencies (e.g., adaptation/uncertainty) and align outcomes, closing gaps in both technical and professional domains.
- **Communication as a strategic lever**: reframed as professional formation
- **Partnerships as infrastructure**: forums, advisory roles, and co-created projects are being formalized so changes persist beyond individual champions.

HOW WILL YOU SPARK INNOVATION IN CIVIL ENGINEERING EDUCATION?

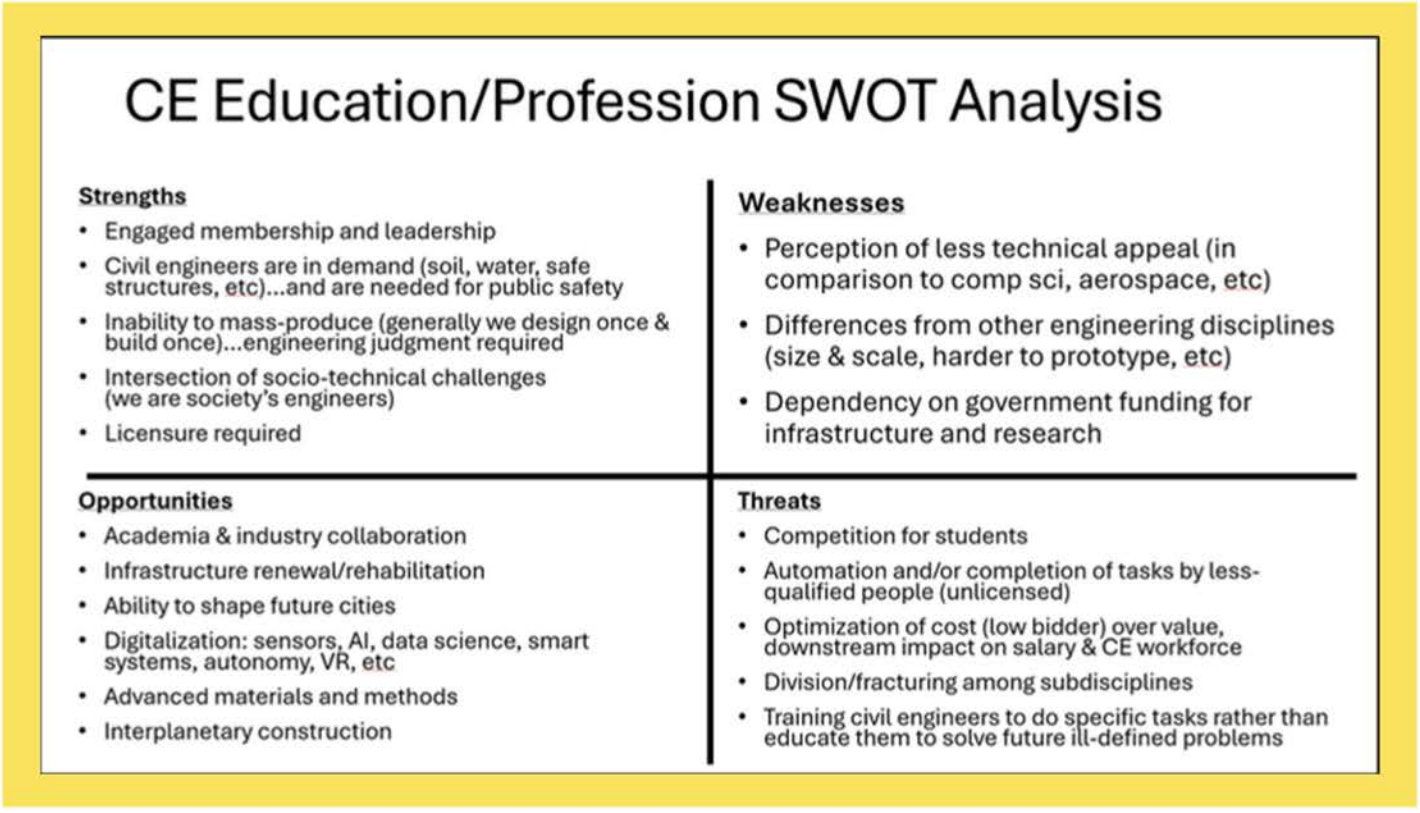
Civil Engineering Education and Profession SWOT Analysis

Joel Sloan presented the slide below on Day 3 of the summit as a combined Strengths-Weaknesses-Opportunities-Threats (SWOT) analysis of civil engineering education and state of the profession. The analysis was informed by discussions of the ICEE working group meetings leading up to the summit, Ressler's paper "Sociology of Professions", and the presentations and discussions at the Education Summit itself. Civil engineers will continue to be in demand, and our profession is leading the way with its **third education summit** since 2019 and efforts that are underway for the **4th iteration of the body of knowledge**. Civil engineers enable modern society and modern/future cities by our unique ability to solve socio-technical problems. We are protected by licensure requirements currently, but threats to licensure are a threat to the profession.

Civil engineering is sometimes perceived as being less technically advanced than some other engineering disciplines, but the reality is that **CEs are at the forefront of innovation, and we need to be able to better tell this story**. At various points in history, government funding could be a strength, but it is a current weakness in an age of government efficiency. Opportunities in CE include collaboration between academia and industry to renew and rehabilitate infrastructure, shape future cities, digitalize our infrastructure, employ advanced materials and methods, and develop infrastructure on the moon and beyond.

In addition to the threat to licensure, **competition for students could result in loss of talent to other disciplines**. Commoditization of CE tasks and/or educating/training students in a task-oriented manner are also threats. An additional threat is the **fracturing of civil engineering into subdisciplines**: do we see ourselves as geotech, structures, water resources, etc? Or do we collectively see ourselves as civil engineers and collaborate to make our profession better?

Finally, the efforts of the Education Summit uniquely apply to this analysis as outreach strategies developed at the conference can help our profession overcome the weaknesses, technical skill opportunities can help us achieve the opportunities, and many of the professional skills and outreach can help insulate our profession against the threats.



ADJO AMEKUDZI

Professor Adjo Amekudzi-Kennedy studies how integrated systems—built, natural, social, and informational—can support smarter, more sustainable development. Her research focuses on systems and sustainability engineering to enhance resilience and equity in infrastructure. A prolific author and educator, she teaches civil and infrastructure systems at Georgia Tech and co-founded its Global Engineering Leadership Minor. She is the founding Chair of ASCE's Committee on Sustainability and the Environment and has served on several national boards, including the NRC's Board on Infrastructure and the TRB's Transportation Asset Management Committee. She is a fellow of ASCE and a member of the National Academy of Construction.

ADDA ATHANASOPOULOS-ZEKKOS

Dr. Adda Athanasopoulos-Zekkos is an Associate Professor of Civil and Environmental Engineering at the University of California, Berkeley. Previously, she was a faculty member at the University of Michigan from 2008 to 2019. She earned her M.Sc. and Ph.D. in Geotechnical Engineering from UC Berkeley. Adda's research focuses on soil liquefaction, seismic slope stability, and the resilience of flood protection systems under extreme loading, including earthquakes and hurricanes. She has received numerous honors, including the NSF CAREER Award, multiple ASCE awards, and the 2024 Buchanan Lectureship. A past president of USUCGER, she has also participated in several GEER missions and is advancing new technologies for geotechnical monitoring, design, and reinforcement.

ACHINTYA BEZBARUAH

Achintya Bezbaruah is the Gerts Presidential Professor and Interim Chair of Civil, Construction, and Environmental Engineering at North Dakota State University. His research in environmental nanotechnology, focused on water and agriculture, is funded by agencies like NSF and USDA. He is President of the Sustainable Nanotechnology Organization, a two-time Fulbright Scholar, and active in ASCE's EWRI. He founded NDSU's Grand Challenges Scholars Program and helped launch its Environmental Engineering undergraduate degree. Under his leadership, departmental research funding has doubled. He holds degrees from the University of Nebraska–Lincoln, IIT Bombay, and Assam Engineering College.

CJ BOLDING

Dr. Candice "CJ" Bolding is a Lecturer in Clemson University's Glenn Department of Civil Engineering, where she supports the professional formation of civil engineering students. Her teaching emphasizes skills for academic, professional, and collaborative success. Dr. Bolding's research explores structured learning environments, sense of belonging, and critical consciousness in STEM education, with a focus on systemic factors affecting student outcomes. Her work aims to enhance student engagement, persistence, and preparation for the evolving demands of the engineering profession. She is passionate about creating inclusive learning spaces that empower all students. Outside of academia, she enjoys mentoring, community outreach, and exploring creative pursuits.

JERRY BUCKWALTER

Gerald (Jerry) Buckwalter is a consultant specializing in strategic planning for business, engineering, and technology. He is Director of Innovation at Atlas International, Partner at the ARES Institute, and Board member of the Center for Public Policy Innovation. Formerly ASCE's Chief Innovation Officer, he developed a future-focused model for the built environment. Jerry was Corporate Director of Strategy at Northrop Grumman and served on the National Infrastructure Advisory Council under Presidents Bush and Obama. He has held leadership roles with the National Homeland Defense Foundation and the Defense Science Board. He holds a Physics degree from Monmouth University and studied further at King's College, GWU, and MIT.

SCOTT CASE

Scott Case received his PhD degree from Virginia Tech in 1996 and has been a faculty member at Virginia Tech since 1997. His technical research interests are in the experimental characterization and modeling of engineering materials and structures. Recent activities include the response of lightweight structural materials to combined fire and mechanical loading as well as accelerated test method development to support long-term durability predictions for adhesives and fiber-reinforced composites. He is currently the Reynolds Metals Professor in the Via Department of Civil and Environmental Engineering and Associate Department Head for Undergraduate Studies. In this administrative role he works to support faculty and student success through data-driven decision making.

SHIRLEY CLARK

Dr. Shirley E. Clark (Ph.D., P.E., BC.WRE, F.EWRI) is a professor of environmental engineering and Acting Director of the School of Science, Engineering, and Technology at Penn State Harrisburg. She holds degrees from Washington University and the University of Alabama at Birmingham. Her research focuses on stormwater treatment systems, urban hydrology, and the environmental impacts of land development. A former consulting engineer, Dr. Clark has served on expert panels for the National Academies, the Chesapeake Bay Program, and the Pennsylvania Water Resources Advisory Committee. Within ASCE, she is past president of EWRI and remains active in leadership and climate collaboration initiatives.

ROBERT GILBERT

Dr. Robert Gilbert is Chair and Professor of Civil, Architectural and Environmental Engineering at The University of Texas at Austin. He holds the Cockrell Family Chair of Departmental Leadership #3 and the Nasser I. Al-Rashid Chair in Civil Engineering. An expert in geotechnical engineering, his work focuses on performance reliability and risk management for systems such as offshore foundations, slope stability, and waste containment. Dr. Gilbert earned his B.S., M.S., and Ph.D. in Civil Engineering from the University of Illinois at Urbana-Champaign and is known for integrating risk-based approaches into engineering practice.

JANE HOWELL

Jane Howell, ASCE's Chief Communications & Strategy Officer oversees ASCE's corporate and strategic communications, establishing and amplifying the ASCE brand globally. She served as executive producer of the award-winning IMAX film and educational projects, Dream Big: Engineering Our World and Cities of the Future. She has also led the development of high-profile public and media outreach programs including the Report Card for America's Infrastructure.

MARIA LEHMAN

Maria Lehman, 2023 ASCE President, is the U.S. Infrastructure Market Leader at GHD, bringing over 40 years of experience in both public and private civil engineering sectors. She has held executive roles at Parsons, the New York State Thruway Authority, and Erie County, NY. A licensed Professional Engineer, Maria has managed over 700 infrastructure projects—from $10,000 to $3.9 billion—including Design-Build and Public-Private Partnerships. She earned her BS in Civil Engineering, Magna Cum Laude, from SUNY Buffalo. A dedicated ASCE leader since 1983, Maria has served on numerous boards and committees and has received multiple national and state engineering awards.

JULES LLOYD

Juliann Lloyd works full time as a Transmission Line Engineer at Georgia Transmission, where she specializes in the routing and design of high-voltage power lines and manages complex utility relocation projects across the state. She is also a Clemson alumna and current MS candidate in Civil Engineering, focusing on transportation systems. Drawing from industry experience, she developed a hands-on case study for Clemson's undergraduate transportation courses to teach roadway and utility conflict resolution. Passionate about bridging education and practice, Juliann is committed to preparing future engineers to thrive in multidisciplinary, real-world environments.

ALLISON MACKAY

Dr. Allison MacKay is Professor and Chair of Civil, Environmental and Geodetic Engineering at The Ohio State University. She is leading the department at a time of strong student enrollments, faculty growth, and rapidly evolving infrastructure needs. Key initiatives include renewing curricula with emphasis on student skills, strengthening department-industry connections, and equipping faculty to create inclusive classrooms. Dr. MacKay directs research on the fate of contaminants in aquatic systems, with emphasis on drinking water treatment to remove contaminants and reduce waste byproducts. She is a member of the ASCE Department Heads Coordinating Council.

JENNIFER OGLE

Dr. Jennifer Ogle is a professor and department chair of Civil Engineering at Clemson University, and served as Principal Investigator on Clemson's $2M NSF RED grant to revolutionize the curriculum and culture of the department. She currently chairs the ASCE Innovations in Civil Engineering Education working group. A Champion of Change for Women in STEM, recognized by President Obama, Dr. Ogle is a passionate advocate for inclusive leadership, student success, and purpose-driven education. Dr. Ogle earned her BS/MS from the University of Tennessee and her PhD from Georgia Tech - all in civil engineering. She is a member of the NAS TRB Safety Performance committee, and her research focuses on making better design decisions to reduce traffic injuries and fatalities on our roads.

FREDDY PAIGE

Dr. Frederick ("Freddy") Paige is an Assistant Professor in the Vecellio Construction Engineering and Management Program at Virginia Tech and Assistant Director of the Virginia Center for Housing Research. He founded the STILE Research Group, which explores the intersection of Society, Technology, Infrastructure, and Learning Environments. A co-founder of VTDITC: Hip Hop Studies at Virginia Tech, Dr. Paige is active in ASCE MOSAIC, CIT-E, and NSBE. His research focuses on developing sustainable infrastructure and educating an informed public. A three-time Clemson graduate, Dr. Paige brings a versatile background in utilities, sustainability, and education to his scholarship and community engagement.

YVETTE PEARSON

Dr. Yvette E. Pearson holds dual Associate Dean appointments in the Erik Jonsson School of Engineering and Computer Science and the School of Natural Sciences and Mathematics at The University of Texas at Dallas. A registered Professional Engineer and Fellow of ASCE and ASEE, she brings over 30 years of experience in academia and consulting, with efforts that have secured over $40M in funding for STEM initiatives. She serves as a Commissioner on ABET's Engineering Accreditation Commission and has received honors such as ASCE's President's Medal and ABET's Claire L. Felbinger Award. Dr. Pearson is also the author of Making a Difference and host of the ENGINEERING CHΔNGE® podcast, with global audiences in over 80 countries.

JULIA WILLIAMS

Julia M. Williams is the author of Making Changes in STEM Education: The Change Maker's Toolkit (2023). She recently retired as Professor of English at Rose-Hulman Institute of Technology, where she was Principal Investigator on the NSF RED Participatory Action Research project, supporting faculty change efforts across 26 engineering programs. A founding team member of the Making Academic Change Happen Workshop, her research focuses on academic change, assessment, and professional communication. Dr. Williams has received grants from NSF, Microsoft, and HP, and numerous honors, including the IEEE Schlesinger Award and ASEE Sterling Olmsted Award. She is widely published in venues such as the Journal of Engineering Education and IEEE Transactions on Professional Communication.

JOEL SLOAN

Colonel Joel Sloan, PhD, PE, F.ASCE, is Professor and Head of the Department of Civil and Environmental Engineering at the United States Air Force Academy. He leads a team of 21 faculty and staff in the design and teaching of 30 core and elective civil engineering courses, in scholarship across a variety of civil and environmental engineering topics, and in developing officers of character to lead in the Air and Space Forces. His research spans engineering education, column-supported embankments, and lunar regolith characterization. A distinguished graduate of the Academy, he holds graduate degrees from the University of Colorado Boulder and Virginia Tech. Col. Sloan chairs ASCE's Department Heads Coordinating Council and serves on the ASCE Committee on Education.

ALAN STADLER

Alan Stadler, Ph.D., P.E., is a seasoned civil engineer with experience spanning private consulting, academia, and the federal government. As Wade Trim's Conveyance Practice Lead, he oversees projects ranging from asset rehabilitation to new infrastructure for added capacity. Alan specializes in heavy civil engineering with a focus on water/wastewater systems, program management, and geotechnical engineering. His work includes water distribution systems, stormwater infrastructure, wind farm design, and green building solutions. Known for integrating emerging technologies, he effectively leads complex projects and diverse teams. Alan holds BS and MS degrees from The Ohio State University and a Ph.D. from the University of Colorado, all in Civil Engineering.

DONALD WEBSTER

Dr. Donald Webster, Ph.D., P.E., is the Karen & John Huff School Chair and Professor in the School of Civil & Environmental Engineering at Georgia Tech, where he has served since 1997. His research in environmental fluid mechanics explores how fluid motion and turbulence affect biological systems, with contributions spanning sensory biology, biomechanics, experimental techniques, and bio-inspired design. He is a Sustaining Fellow of the Association for the Sciences of Limnology and Oceanography (ASLO) and a Fellow of ASCE. Dr. Webster has received numerous honors for teaching and innovation, including the Felton Jenkins Jr. Hall of Fame Faculty Award and the Class of 1934 Award for Innovative Use of Education Technology.

DAMON WEISS

Damon Weiss is a Professor of the Practice in Civil & Environmental Engineering at Carnegie Mellon University, where he teaches graduate courses on digital twins and advanced infrastructure systems. He holds an M.S. from Carnegie Mellon and a B.S. from the University of Virginia, with 28 years of experience in digital modeling, urban systems, and data-informed design. Weiss co-founded Ethos Collaborative, a Pittsburgh-based firm focused on sustainable, community-centered urban design. His work bridges emerging technologies—like AI, simulation, and geospatial analytics—with the human scale of infrastructure to support climate resilience, equity, and performance in the built environment.

HOW ARE YOU SPARKING INNOVATION?

Special thanks goes to the Innovations in Civil Engineering Education Working Group!

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