STEM connector



HARNESSING EXPERIENTIAL LEARNING TO SUPPORT STEM OUTCOMES

Innovation Lab Brief

February 2025

Hosted by

FIU | FLORIDA INTERNATIONAL UNIVERSITY

At STEMconnector, we believe that experiential learning is not just an enhancement to STEM education—it is an essential driver of workforce readiness, innovation, and economic growth. **The Harnessing Experiential Learning to Support STEM Outcomes Innovation Lab**, hosted in partnership with Florida International University (FIU), evidenced this belief by showcasing cutting-edge approaches to hands-on learning and industry collaboration.

We focus our efforts on advancing sustainable and impactful employer engagement in STEM Education and workforce development. This is critical because the quality of our STEM workforce depends on our ability to continually bridge the gap between education and the workforce. The conversations, site visits, and strategic discussions from this Innovation Lab reaffirm the transformative impact of experiential learning, particularly in engaging disadvantaged populations and scaling universal access to STEM careers.

Through collaborative partnerships with employers, students can develop and nurture future-focused competencies. As you will see in this brief, the integration of emerging technologies, mentorship, and ambiguity tolerance in learning environments fosters resilience, creativity, and adaptability—critical skills for the future of work.

This brief captures not just the insights and best practices from the Lab, but also a shared commitment to **sustained, impactful, and measurable action**. As we move forward, we must continue working together—across academia, industry, and policy—to expand access to experiential learning opportunities and empower the next generation of STEM leaders.

Thank you to all the partners, participants, and innovators who made this convening possible. Let's continue to build pathways that turn learning into action and potential into impact. Feel free to contact me with any questions.



Ted Wells

President, STEMconnector

Overview

STEMconnector and Florida International University (FIU) hosted the *Harnessing Experiential Learning to Support STEM Outcomes* Innovation Lab on February 19th and 20th, 2025 in Miami, Florida. The event explored innovative methods around experiential learning, and other engagements that support applied learning to prepare students for the workplace.

The Innovation Lab brought together experts to explore the critical role of experiential learning in STEM education and its impact on economic growth and sustainability. Participants engaged in dynamic discussions on how hands-on experiences—such as apprenticeships, research opportunities, and study abroad programs—enhance student success and workforce readiness.

Key conversations focused on defining experiential learning, showcasing successful models, and identifying strategies to demonstrate its impact. While challenges in industry and government engagement were acknowledged, the event fostered optimism for future collaborations. Attendees left with a clearer understanding of how experiential learning drives STEM outcomes and a shared commitment to advancing innovative education pathways.



Site Visits

Participants of our Innovation Lab toured multiple departments on the FIU campus that showcase experiential education in action. The tours provided attendees with a comprehensive understanding of FIU's significant role and clear strategic focus on students, and the role of hands-on and experiential learning opportunities in every department. Site visits included:

- The **FIU Wall of Wind (WOW)** is a state-of-the-art hurricane simulation facility at FIU. It is capable of producing Category 5 hurricane winds (up to 157+ mph) to test buildings and structures for their resilience against extreme weather conditions, as well as specific building materials.
- A **Cold Spray and Rapid Deposition (ColRAD) Lab** is a specialized research and development facility focused on cold spray technology and high-speed additive manufacturing. These labs are typically found in universities, national laboratories, and industrial research centers, supporting applications in aerospace, defense, automotive, and advanced materials engineering.
- The **FIU-FPL Microgrid** is a collaborative research initiative between Florida International University (FIU) and Florida Power & Light (FPL) designed to enhance energy resilience, sustainability, and innovation. The Microgrid serves as a hands-on training facility for students, engineers, and researchers working on grid modernization.
- **FIU STEM Transformation Institute** is a research-focused initiative that is dedicated to improving STEM education on all levels. It integrates cutting-edge research with innovation teaching practices to enhance student learning, retention and success, particularly for underrepresented groups in STEM fields. This initiative focuses on increasing graduation rates and closing equity gaps in STEM education.
- **The FIU Institute of Environment CREST Center for Aquatic Chemistry and Environment** aims to address the complex issues of environmental contamination in South Florida, featuring cutting-edge technology in contaminant detection, monitoring and analysis. A key feature of this effort is the deployment of three specialized research buoys, designed for both shallow freshwater ecosystems and near-shore marine environments, providing crucial data for ongoing environmental research and conservation.
- While studying at **FIU Chaplin School of Hospitality & Tourism Management**, students can get a head start on their careers through a number of one-of-a-kind opportunities, such as helping to run the largest gourmet gathering in the world, the **South Beach Wine & Food Festival**®.





Harnessing Experiential Learning to Support STEM Outcomes

A STEMconnector Innovation Lab Agenda	Thursday, February 20, 2025
8:30 AM	Registration and Breakfast
9:00 AM	**Welcome** • Dr. Michael Heithaus, Vice Provost, Florida International University
9:20 AM	**Overview of Event** • Ted Wells, President, STEMconnector
9:35 AM	**Introductions** • Renee Aaron, Partnership Specialist, STEMconnector
9:50 AM	**Panel: Defining and Exploring the Power of Experiential Learning to Drive STEM Outcomes** • Dr. Janell Catlin, Vice President of Equity, Diversity, and Inclusion, FIRST • Dr. Remy Dou, Associate Professor, STEM Transformation Institute, Florida International University • Lawrence Jackson, Chief Administrative Officer, STEM NOLA/STEM Global Action • Dr. Diana Elrod, Director, Center for Student Research, Texas Woman's University, Moderator
10:30 AM	**Networking Break**
11:00 AM	**Making & Tinkering as a Pathway to Ambiguity Tolerance** • David Wells, Education Consultant, The NewSpace
11:30 AM	**Table Discussion:** Strategies for Scaling Experiential Learning
12:00 PM	**Networking Lunch**
12:50 PM	**Presentation: Bridging the Gap - How Holistic Industry-Academic Partnerships Cultivate Career-Ready Graduates** • Gretchen Sauerman, Senior Director of Development, College of Engineering and Computing, Florida International University • Bruce Jamison, Manager of Support Programs, Florida Power & Light (FP&L) • Christina Kale, Customer Experience Journey Architect, Florida Power & Light (FPL)
1:15 PM	**Panel: Leveraging Technology to Optimize and Scale STEM Experiential Learning** • Dr. Colleen Bielitz, Associate Vice President, Strategic Initiatives and Outreach, Office of Academic Affairs, Southern Connecticut State University • John Stuart, Associate Dean for Cultural and Community Engagement, Florida International University • Angela Consani, CEO and Co-Founder, Bioscience Core Skills Institute • Drew Glassford, Chief Executive Officer, The Glassford Group LLC, Moderator
2:00 PM	**Table Discussion**
2:15 PM	**Next Steps and Closing** • Ted Wells, President, STEMconnector

To kick-off the day, Innovation Lab attendees were welcomed by Dr. Michael Heithaus, Vice Provost of Florida International University (FIU), where he highlighted FIU's commitment to innovation, tackling real-world challenges, and equipping students to become leaders in a rapidly changing world. He also spotlighted the success of FIU's STEM Transformation Institute, which has seen significant improvements in student pass rates and overall learning outcomes. The Institute's model of embedding faculty in academic departments to focus on education, research, and learning has been particularly effective.

Dr. Heithaus emphasized FIU's goal to become a vibrant center where students, faculty, and industry partners unite to collaborate, innovate, and transform visionary concepts into practical solutions.







Panel: Defining and Exploring the Power of Experiential Learning to Drive STEM Outcomes

Experiential learning is revolutionizing how students and professionals connect with STEM education and career opportunities. This panel focused on the importance of experiential learning and inclusive STEM education for youth across various settings, emphasizing the role of emotional connections and parental involvement in fostering interest in STEM fields. Panelists discussed strategies for creating supportive environments, building trust in communities, and involving multiple stakeholders to enhance program effectiveness. The discussion also highlighted the significance of scaling experiences by age, promoting gender parity, and partnerships with organizations to provide diverse opportunities for students in STEM.

Key takeaways from panel discussion:

STEM Education in Diverse Environments	STEM learning happens in multiple settings, including museums, after-school programs, and home environments, broadening access and engagement.
Belonging Matters	Ensuring every student feels seen, heard, and welcomed is essential for fostering diversity in STEM fields.
Community Partnerships Enhance Engagement	Collaborations with organizations and community centers help bring STEM experiences to a wider audience.
Experiential Learning Sparks Interest	Hands-on learning is crucial in inspiring students and shaping their interest in STEM careers.
Balancing Skills-Based and Emotional Learning	While technical skills are important, emotional connections to STEM learning play a key role in long-term engagement.



Presentation: Bridging the Gap: How Holistic Industry-Academic Partnerships Cultivate Career-Ready Graduates

Siemens Partnership with FIU

The Siemens-FIU partnership fosters industry-relevant skill development, enabling students to work in multi-disciplinary teams alongside industry mentors in a student-centered learning environment. Siemens' endorsement of FIU graduates enhances employer investment and strengthens the university's reputation. Through collaborative research, the partnership advances Industry 4.0 innovations while engaging multiple departments, including Mechanical and Materials Engineering (MME), Electrical and Computer Engineering (ECE), Knight Foundation School of Computing and Information Sciences (KFSCIS), Civil Engineering, External Programs, and Business, ensuring a broad and impactful approach to workforce readiness.



Key takeaways from the collaboration project include:

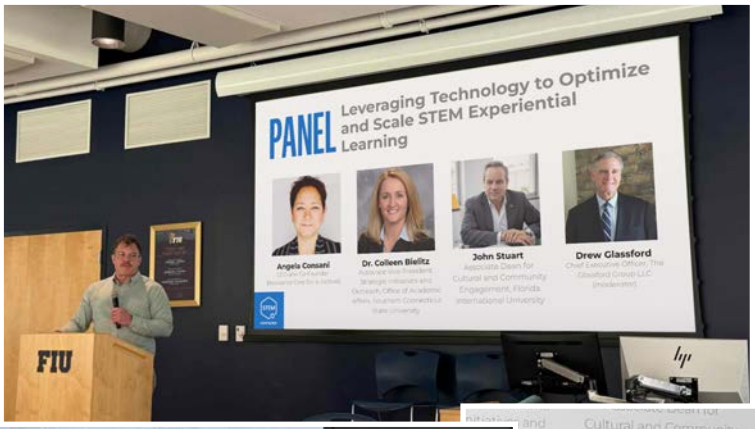
Workforce Development	The partnership includes training programs to equip students with skills in automation and digitization which prepares them for careers in engineering and technology.
Real-World Learning	Students gain hands-on experience through internships and practical projects that interface with Siemens' technology.

Florida Power & Light Transforms the Technical Workforce

Florida Power & Light (FPL) is transforming its technical workforce by integrating state of the art technologies into lineworker training. With a strong demand for STEM talent, the company collaborates with FIU and the power delivery partnership to provide part time STEM employment opportunities for students, strengthening industry-academic connections. FPL also offers apprenticeship and internship programs, certifying government assistants and cable splicers while providing students with hands-on experience. Additionally, through a partnership with United Way of Miami, FPL is piloting a program to introduce young students to utility work. While the apprenticeship program currently supports 200 participants, FPL remains committed to recruiting STEM talent that reflects the diversity of the communities where they operate.

Panel: Leveraging Technology to Optimize and Scale STEM Experiential Learning

This panel examined how technology enhances experiential learning in STEM, focusing on innovation, accessibility, and workforce readiness. Extended reality (XR) technologies, like virtual and augmented reality, were highlighted for their ability to immerse students in otherwise inaccessible environments.







The discussion also emphasized transdisciplinary collaboration, equipping students with industry-aligned skills, and the role of AI and data analytics in education and the workforce, highlighting the need for inclusive and responsible AI development.

Challenges in technology implementation and sustainability were addressed, particularly hardware obsolescence and the need for adaptable software. Panelists also noted the importance of balancing technology with critical thinking, communication, and adaptability skills.

Key takeaways from panel discussion:

Technology's Impact	XR and AI are transforming STEM experiential learning, making it more immersive and accessible and adaptable to highly engaging scenarios.
Industry Partnerships	Collaborations between education and industry help bridge the gap between classroom learning and workforce demands using real-world simulations.
AI Literacy & Ethics	Addressing AI bias and representation is crucial for responsible integration into education and alignment with industry.
Adapting to Change	Institutions must find ways to keep pace with rapid technological advancements to maximize their value and relevance to industry.
Balanced Approach	The future of education lies in integrating emerging technologies with essential hands-on learning experiences.

Activity: Making & Tinkering as a Pathway to Ambiguity Tolerance

Participants engaged in a hands-on workshop lead by David Wells, The NewSpace, designed to build ambiguity tolerance by exploring open-ended challenges with limited set instructions or single correct answers. Using everyday materials in unexpected ways and working within playful constraints, attendees experimented with design ideas to navigate uncertainty. The session encouraged reflection on how creating a safe space for mistakes can transform ambiguity from a barrier into an opportunity for innovation and problem-solving. Using Mentimeter, an interactive presentation tool, we were able to capture, in real-time, insightful responses from our audience following the activity. Participants answered the question "Ambiguity is _____ because_____." Some of the responses are listed below:

> *"Ambiguity is unsettling, because having a plan is comfort.*
>
> *Ambiguity is to be embraced because it can lead to what you never imagined!*
>
> *Ambiguity is a catalyst because it drives me to see more than one option.*
>
> *Ambiguity is a lot more fun then I thought it would be because there isn't always one right answer.*
>
> *Ambiguity is opportunity because nothing has been set in stone."*





Conclusion

STEMconnector's first Innovation Lab of 2025 brought together a unique group of leaders to explore how experiential learning contributes to STEM outcomes. Over the course of a two-day, hands-on workshop, participants identified some of the following themes for stakeholders to consider:

- **Opportunities for Experiential Learning are Everywhere** - These opportunities can emerge in both formal and informal learning settings and are essential to making STEM learning relevant and cultivating problem solving skills.
- **Employers can and do play an important role in Experiential Learning** - From providing learning tools to work-based learning opportunities there is a need for STEM employers to partner with educational institutions at all stages of learning.
- **Experiential Learning can cultivate mindsets that are critical to development** - Effective programs can help students cultivate resilience, interpersonal skills, tolerance of ambiguity, and other critical skills.

The workshop also highlighted many of the challenges confronting this aspect of STEM education and workforce development including time, funding, and coordination as well as cultural differences between academia and industry. These challenges are best overcome through intentional collaboration and effective communication to reinforce the value and need of high quality experiential learning programs.

Acknowledgments

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BREAK THROUGH MIAMI

FIRST

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TEXAS WOMAN'S UNIVERSITY

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The NewSpace