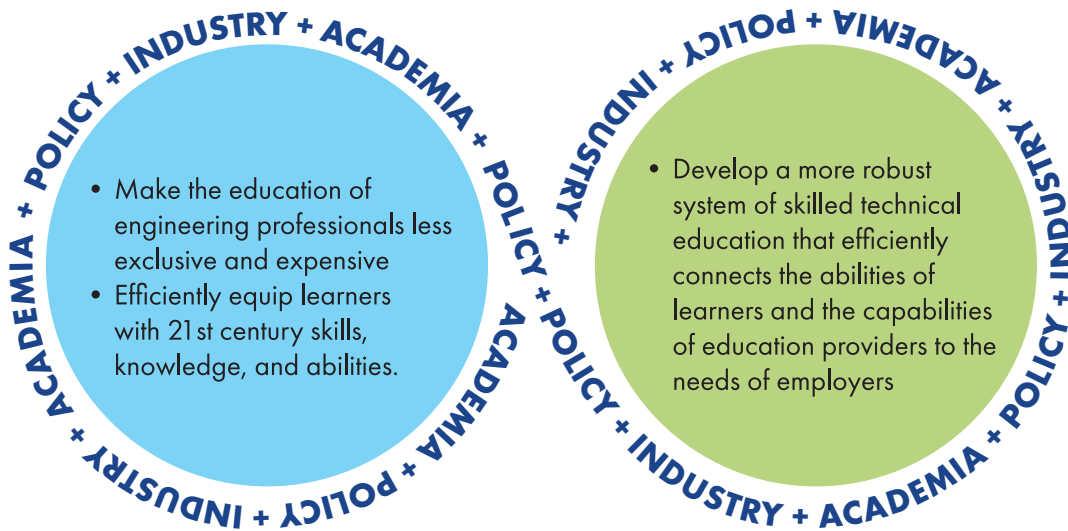# INFOGRAPHIC

PROJECT TITLE:

Dissemination of ASEE Industry 4.0 Webinars and Summit Findings
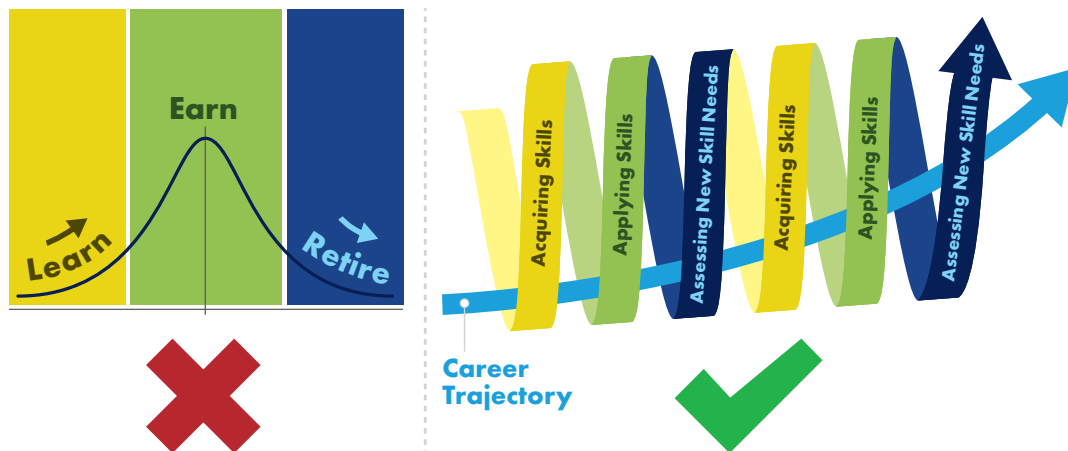### Award # 2232622

The Corporate Member Council of the American Society for Engineering Education (ASEE) launched the Workforce Summit for Industry 4.0 to convene industry experts, academic leaders, and other community stakeholders to plan how to transform education of the skilled technical workforce to respond to the fourth industrial revolution (Industry 4.0).

The Summit focused on two goals:

POLICY + INDUSTRY + ACADEMIA + POLICY + ACADEMIA + POLICY + INDUSTRY + ACADEMIA

- Make the education of engineering professionals less exclusive and expensive
- Efficiently equip learners with 21st century skills, knowledge, and abilities.

- Develop a more robust system of skilled technical education that efficiently connects the abilities of learners and the capabilities of education providers to the needs of employers

The Summit identified three overarching trends:

1. Today, a technical career is a **helix, not an arc.**

Learn — Earn — Retire

❌

Career Trajectory

Acquiring Skills — Applying Skills — Assessing New Skill Needs — Acquiring Skills — Applying Skills — Assessing New Skill Needs

✅

For much of the 20th century, technical workers could expect their career to follow a single sequence of steps: Learn, then Earn, then Retire. Today's technical careers are helical, a series of recurring cycles: acquiring skills, applying those skills, and assessing new skills needs. Learners take these steps repeatedly and at times concurrently.

2. Learners in this environment require **multiple on-ramps and off-ramps** at each juncture between learning, earning, and assessing.
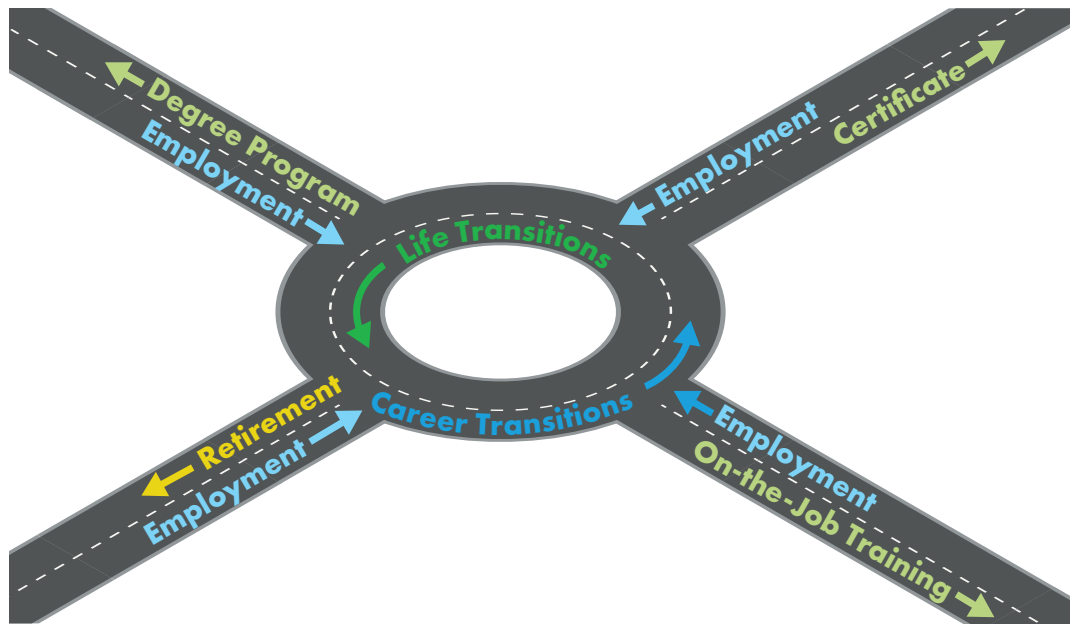
Employers and educators need to be far more flexible in onboarding and offboarding individuals who progress through their institutions. Learners need to be able to transition smoothly from one step to the next and from one institution to the next.

3. The relationship between an institution and its employees or students is **no longer one to many. It is now many to one.**
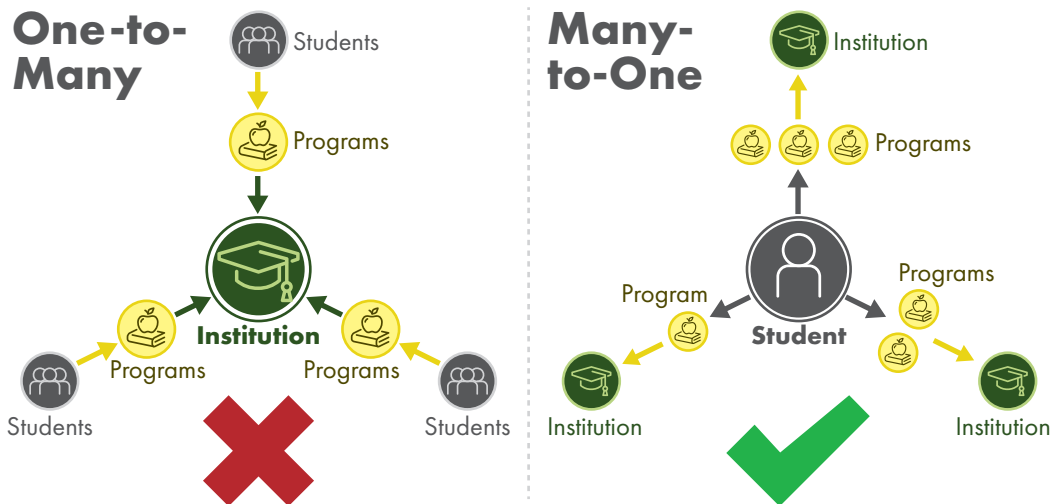
Workers will change employers, career fields and industries several times during their career. Students will attend multiple institutions while completing a variety of courses, programs, certificates, or degrees.

The existing education system is optimized to **deliver standardization at scale**. But today's technology permits, and our culture demands, **customization at scale**: the ability to adapt the modality and content of instruction to meet an individual's learning style, learning goals, and baseline knowledge.
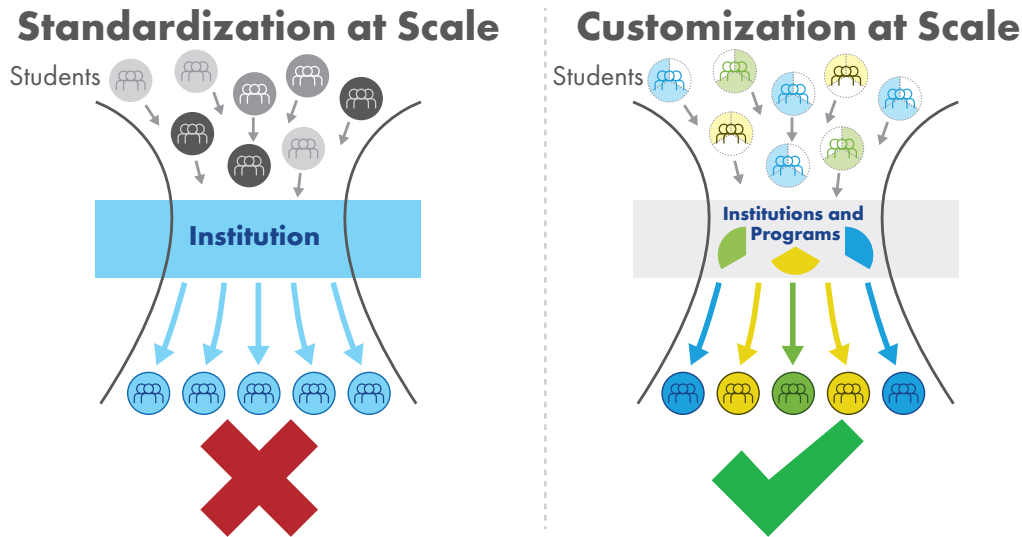
Information technologies now exist to assess learners' individualized needs and goals, and to deliver individualized programs and assessments to help them reach them. The means exists to maintain an individual's personalized record of credentials achieved and skills demonstrated and deliver them to employers and educators at the learner's direction.

KEY RECOMMENDATIONS

University as a Service (UaaS)
The transformation to Software as a Service (SaaS) revolutionized what and how technology companies serve the market. A similar transition is needed in education - a membership model for life-long relationships between learners and institutions.

Diversity Is the Challenge; Diversity Is the Solution
Solving the US talent crisis requires creating pathways for women and people of color who have been blocked from STEM careers by social, economic, and cultural barriers. Closing the talent gap requires closing the wealth gaps along racial, gender and geographic lines. Educators and employers need to remain steadfast in providing equal access and delivering equitable outcomes.

Democratize Engineering
Democratizing engineering requires shifting the model from one-to-many to many-to-one. States should consider adopting policies that lower barriers to entry to higher education, and foster partnerships between community colleges and universities.

Adjacencies Are Key
Aligning the right partners is essential to scale and drive success. Adjacencies—within region, industries, and fields of knowledge—are where those partners will be found.

Mentors Are Essential
Peer-to-peer education within companies, and mentor relationships between individual faculty and professionals, are needed to effect needed collaboration between generations of workers and across the sectors of academia and industry.

THE PATH AHEAD

Four lighthouse examples offer particularly promising models:

Lighthouse Examples

1. A regional-scale integrated learning environment for K12 STEM skill development
The STEM Coliseum and Learning Center of Maine offer a regional model for concentrating a scale of talent and resources that individual school districts would struggle to afford individually.

2. An academic-Business-Policy collaboration to develop accredited microcredentials
Siemens Digital Industries Software is partnering with universities and ABET (the engineering program accreditor for universities) to build recognized micro-credential programs that combine the speed and flexibility of microcredentials with the quality assurance of ABET recognition.

3. A graduate program blending business and engineering skills for mid-career professionals.
The University of Washington's Global Innovation Exchange (GIX) represents an emerging model of graduate program that breaks down the traditional silos of business and engineering schools and builds learners' management and technical skills concurrently.

4. Corporate Talent pipeline management
The US Chamber of Commerce Foundation's program, Talent Pipeline Management®, provides employers and their education and workforce development partners with strategies and tools to co-design talent supply chains that connect learners and workers to jobs and career advancement opportunities.

CONCLUSION

The Workforce Summit has demonstrated the urgent need for alternatives to traditional diploma and degree programs to speed up the production of workforce-ready technical professionals at all levels. But the existing system cannot be discarded. Innovation needs to take root alongside and within established modalities. The future needs to include traditional programs that grant diplomas and degrees along established timelines; alternative programs that confer credentials for the demonstration of competencies outside of existing frameworks; and hybrids of the two.