

ExLENT Beginnings Track National Convening

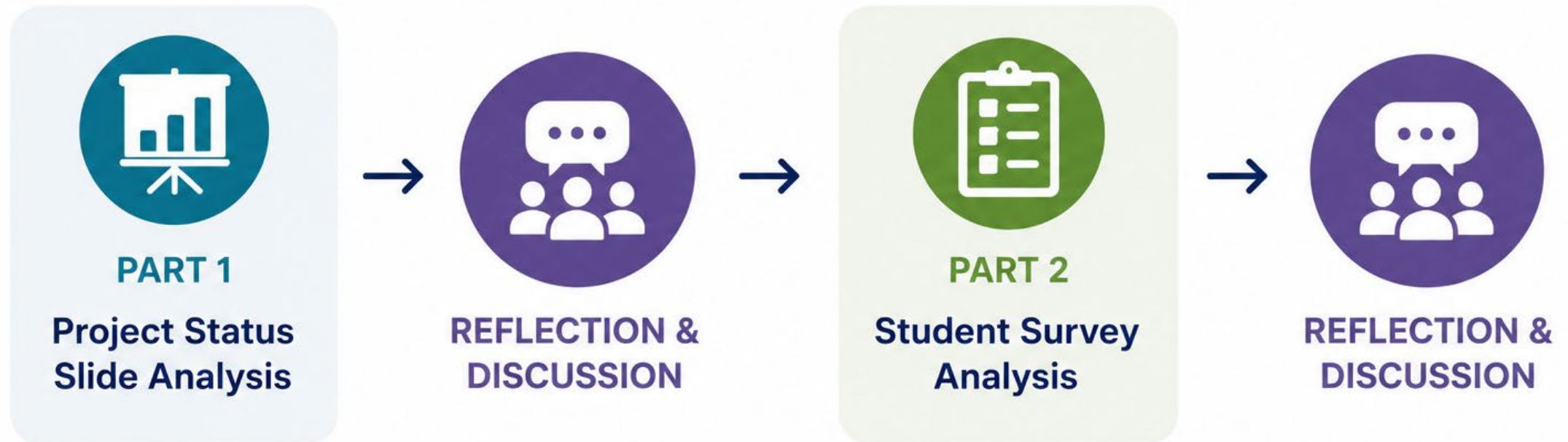
Facilitating Experiential Learning for Emerging and Novel Technologies

Reflections from the ExLENT Beginnings Community: Survey Findings and Discussion

Karl Smith and Kalyn Owens

Session Overview

Objective: Use insights from both the project and student surveys to identify common themes, spark discussion, and inform conversations throughout the convening.



Part 1: Summary Analysis of ExLENT Grantee Project Status Slides

An analysis of the project status slides submitted by **34 Beginnings Track ExLENT grantee projects** attending the convening. We identified common strategies, successes, challenges, and emerging themes across the projects represented.

Dominant Technology Areas



Semiconductors, Microelectronics,
and Wireless Technologies



Biotechnology, Biomanufacturing,
and Bioprocessing



Artificial Intelligence, Computing,
and Generative AI



Quantum Information Science
and Post-Quantum Cryptography



Advanced Manufacturing and
Battery Technologies



Digital Agriculture and
Digital Twins



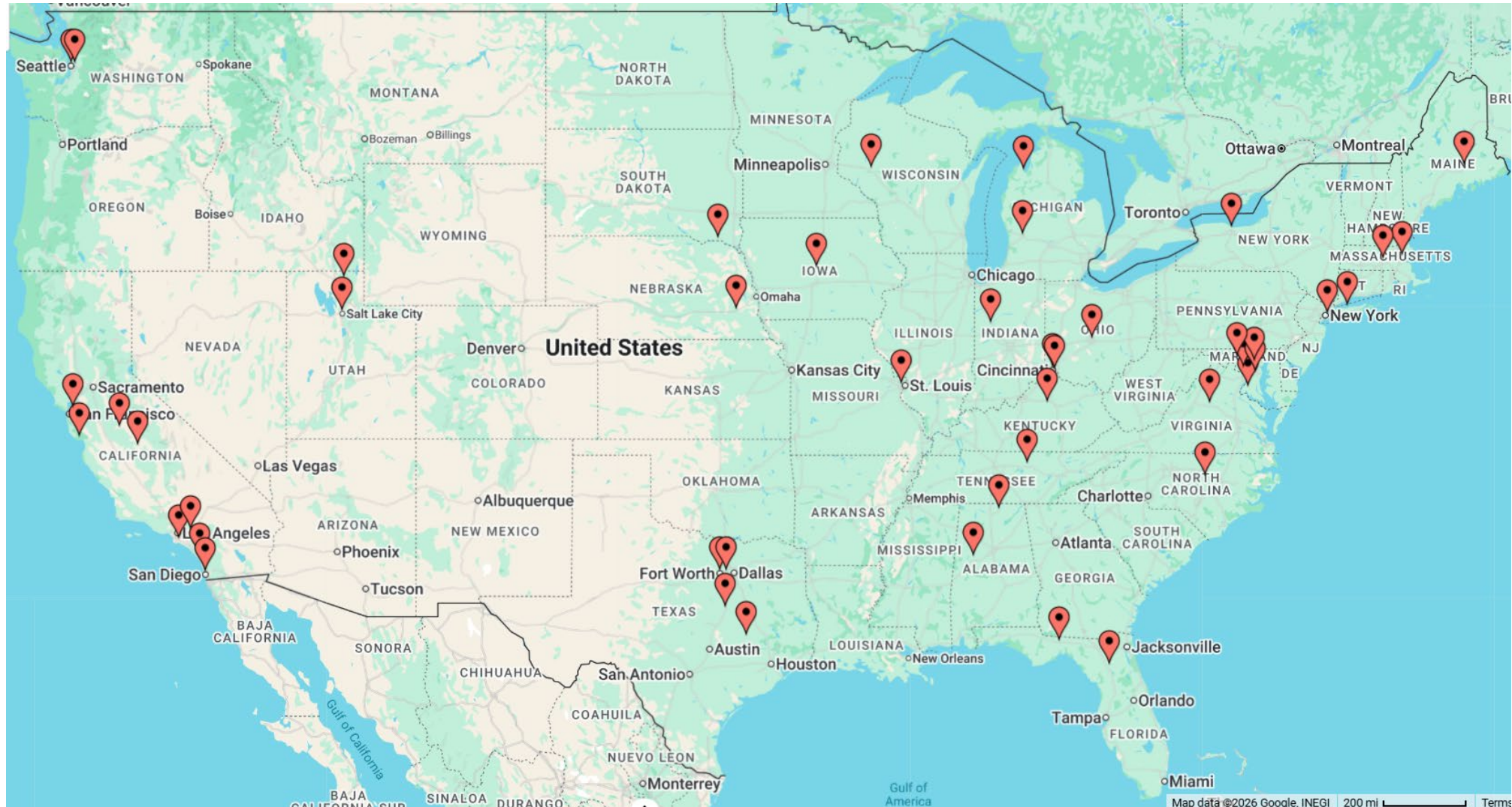
Blue Economy, Marine Autonomous Systems,
and Offshore Wind



Aerospace, Sensors, and
Startup Commercialization



Distribution of Projects Included in the Analysis



Strategies Supporting Successful ExLENT Projects



Cohort-based
pathways



Hands-on
laboratory or
field experiences



Industry
co-development
of curriculum



Pre-internship
bootcamps



Near-peer or
constellation
mentoring



Wrap-around
support and
stipends



Community-college
partnerships



Professional
development



Strategic use of
partner organizations
or employer networks
for recruitment and
placement

Successes

Most Frequently Reported Successes	Share of Projects
Industry/employer/cross-sector partnerships and workforce alignment	88%
Cohort-based, structured pathways, workshops, or fellowships	62%
Hands-on, applied, laboratory, or authentic project learning	56%
Workforce outputs: placements, certificates, jobs, paid research, etc.	53%
Mentoring ecosystems, IDPs, coaching, or tiered mentoring	47%

Additional success themes included: recruitment and participant pipeline building (38%), regional or multi-institution ecosystem building (34%), barrier-reduction supports such as stipends, travel, housing, and flexible program design (28%), and evaluation, feedback loops, and iterative improvement (16%).

Challenges

Most Frequently Reported Challenges	Share of Projects
Industry/employer placement pipeline and partnership capacity	56%
Student recruitment, engagement, retention, scheduling, or commitment	41%
Administrative, legal, onboarding, or multi-site coordination	38%
Scaling hands-on or equipment-/facility-intensive training	31%
Sustainability, post-grant funding, or resources to scale	31%

Additional challenge themes included: student preparation gaps, varied backgrounds, or curriculum pacing (25%); outcome tracking, follow-up, evaluation, or longitudinal data (16%); and market or sector conditions limiting placements (16%).

Emerging Topic Themes for Convening Discussions

Synthesized from input across ExLENT projects



Strengthening Industry Partnerships

Internships and employer partnerships

Employer capacity and engagement

Workforce outcomes and career pathways

Employer networks and feedback



Supporting Student Success

Effective onboarding for diverse pathways and backgrounds

Inclusive mentoring and supervisor training

Support for diverse learners and populations

Transfer pathways and persistence



Scaling High-Quality Experiential Learning

Scaling facility-intensive learning

Maintaining quality, safety, and hands-on access

Keeping curricula current in emerging technologies

Preparing students for fast-moving fields



Sustaining Successful Models

Sustainable funding beyond NSF support

Institutionalization and shared regional infrastructure

Administrative models and practices (agreements, expectations, coordination)

Logistics, travel, and multi-site coordination



Measuring Impact & Learning Together

Common metrics for workforce impact

Student tracking, follow-up surveys, and alumni engagement

Employer feedback and satisfaction

Cross-project collaboration and shared resources

Cross-Project Insights

Experiential learning is strongest where industry partners are deeply embedded.

Internship capacity is the primary bottleneck.

Hands-on training is resource-intensive and challenging to scale.

Student support is essential for retention and completion.

Programs are testing multiple onboarding models.

Sustainability and longitudinal tracking remain unresolved.



Reflection and Dialogue

Individually reflect on the project status presentation:

- **Most interesting, valuable, and/or useful finding**
- **An expected finding that is missing**
- **Questions, comments, suggestions**

Think/write individually for about 1 minute.

Discuss with your neighbor for about 2 minutes

Select/create a response – question or comment – to present to the whole group

Part 2:

Summary Analysis of Student Survey

A survey of students participating in ExLENT projects (**42 analyzable responses**) that provides a cross-section of student experiences related to learning, mentoring, career development, and opportunities for improvement. While not intended to be comprehensive, the survey brings the student voice into the conversation.

Student Survey Snapshot

Who responded to the survey?

42

Student Responses



62%

Current
Participants



38%

Project
Alumni



Broad Representation

Respondents represented multiple institutions, project types, and emerging technology areas.



Age

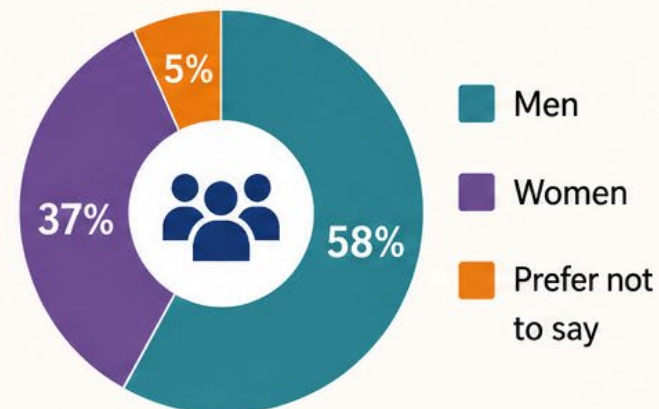
Largest age groups:
22–25 years (40%)
19–21 years (33%)
30 years and older (12%)



Background

100%
entered ExLENT
with a STEM
background.

Gender



Instructional Models

All respondents (100%) reported that the teaching approaches used in their ExLENT project enhanced their learning.

Approach	Responses	Percent
Group Work	37	88%
Active Learning	36	86%
Work-based Experiences	35	83%
Lectures	32	76%
Laboratory, shop, maker-space	30	71%

Additional learning experiences included business and industry connections (57%), homework assignments (55%), online or remote instruction (45%), and AI-assisted instruction (21%).

Mentoring

Students consistently described mentoring as an important contributor to their career development.

Mentoring Types	Responses	Percent
Faculty Mentoring	37	88%
Peer Mentoring	36	86%
Industry Mentoring	35	83%

Career Development

Students consistently identified industry engagement as an important contributor to their career development.

Currently enrolled students (n = 23) most frequently reported:

Career Clarity and Confidence	74%
Exposure to emerging technologies	61%
Industry Connections	52%

Completed students (n = 12) most frequently reported:

Industry Connections	58%
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Opportunities for Improvement

Themes identified from 21 written student responses

43%

Expand mentoring, networking, and career guidance
Increase technical depth and rigor

38%

Increase hands-on and applied learning
**Enhance communication, organization,
and program pacing**

29%

**Strengthen industry exposure and
workplace connections**
Expand exposure to emerging technologies

i Percentages reflect the proportion of the 21 written responses that included each theme. Responses could include multiple themes.

Student Survey Takeaways

- **95%** reported that ExLENT is preparing (or prepared) them for the workforce in an emerging technology field.
- **100%** reported that the teaching approaches enhanced their learning.
- The most common learning experiences: **group work, active learning, and work-based experiences.**
- **Faculty mentoring** was the most common form of mentoring.
- Students recommended: **increasing technical depth, mentoring, networking, applied learning, and enhancing communication, workplace connections, and program pacing.**

Reflection and Dialogue

Individually reflect on the student survey presentation:

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- **Questions, comments, suggestions**

Think/write individually for about 1 minute.

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Thank you!

Acknowledgements

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The ExLENT Beginnings Track grantees for sharing their project status updates.

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