Postsecondary Teaching with Technology Collaborative

Building Students' Confidence and Learning Skills in Online Classes: Lessons from the Postsec Collab

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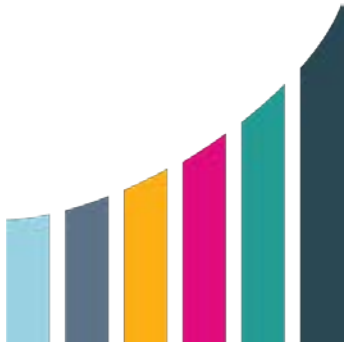
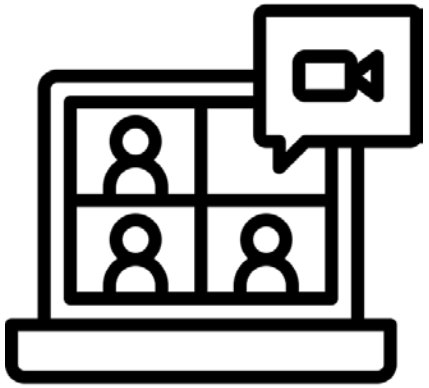
Wednesday, February 19, 2024

ATD DREAM 2025 Conference

Agenda



Overview of the Collaborative



Online STEM learning context and challenges

Strategies to support SDL skills & mindsets

Research findings

Casemaking

Postsecondary Teaching with Technology Collaborative

An IES-funded research and capacity-building center that aims to study and improve how faculty **teach** and **use technology** to help students apply and strengthen **self-directed learning skills** to increase their success in online STEM courses.

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CCRC COMMUNITY COLLEGE RESEARCH CENTER
Teachers College, Columbia University

Achieving the Dream

Welcome!

Slido.com Code: #22527759

In the poll,

- **What is your role at your institution?**
- **What do you want to know more about?** (multiple choice & can select multiple options)
  - ❑ **Supports for students in online courses**
  - ❑ **Self-directed learning (SDL) theory**
  - ❑ **Examples of SDL instructional strategies in online STEM courses**
  - ❑ **Our research on the effectiveness of SDL instructional strategies**
  - ❑ **Effective casemaking for more SDL support at your institution**

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Challenges in online learning

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Students face challenges in online courses

Student outcomes are generally worse in online courses and degree programs than comparable face-to-face ones

In some cases, achievement gaps are wider in online environments

Key factors: Greater demands on students' self-directed learning capacities; Need for belonging and community

(e.g., Jaggars and Xu, 2014; Xu and Xu, 2020)

Students face additional challenges in STEM learning

Unwelcoming environment

Individual sink-or-swim culture

Content-heavy courses

Unclear personal relevance

Belonging uncertainty

Stereotype threat

Inequitable opportunities to develop self-directed learning skills

Feelings of isolation exacerbated in online formats

(e.g., Hatfield et al., 2022; Murdock-Perriera, 2019; National Academies of Sciences, Engineering, and Medicine, 2023; Yarnall et al., 2023)

Perspective from a Partner Institution - Odessa College

Achieved high course success rates overall, yet online courses have unique challenges that require different support strategies.

Many students in online courses struggle with staying motivated, managing their time, and seeking help when needed.

Significant increase in online enrollment, reflecting the growing demand for flexible learning options.

Odessa College's Reasons for Getting Involved in the Collaborative

Students lack the structure of in-person engagement, making it easier to fall behind or disengage.

Provided an opportunity to test new approaches for helping online students build learning habits that drive success.

Focus on self-directed learning (SDL) strategies aligned with Odessa College's goal of helping students develop these critical skills

The 4 Faculty Commitments

Interacting with students by name during the first week of a new term.

Meeting with students one-on-one and communicating routinely about their course performance.

Monitoring student behavior and progress and intervening when an issue arises.

Becoming a “master of paradox” (i.e., maintaining a structured course while allowing for some flexibility).

The 4 Student Commitments

Commit to completing what you start.

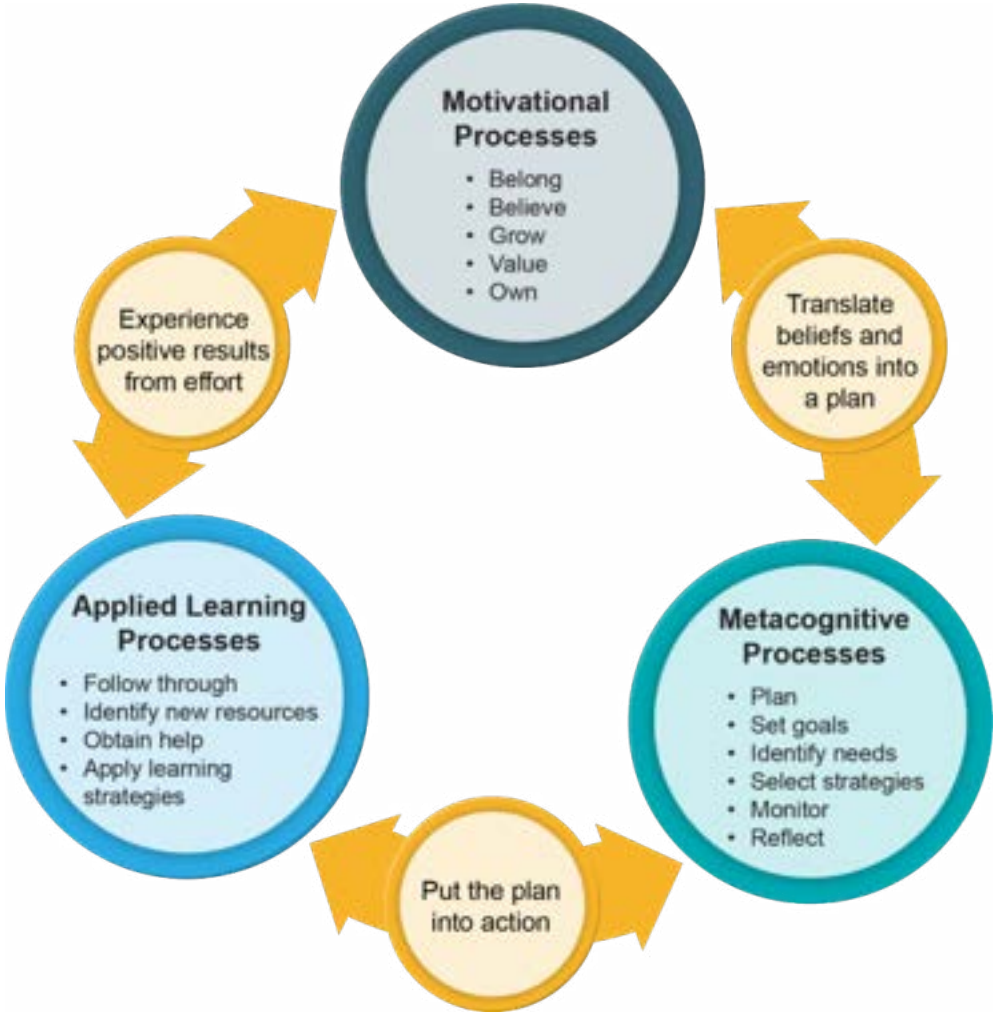
Commit to asking questions and using support resources.

Commit to attending class and attempting each assignment.

Commit to developing well organized and disciplined work habits.

Framework for Self-Directed Learning

Framework for self-directed learning



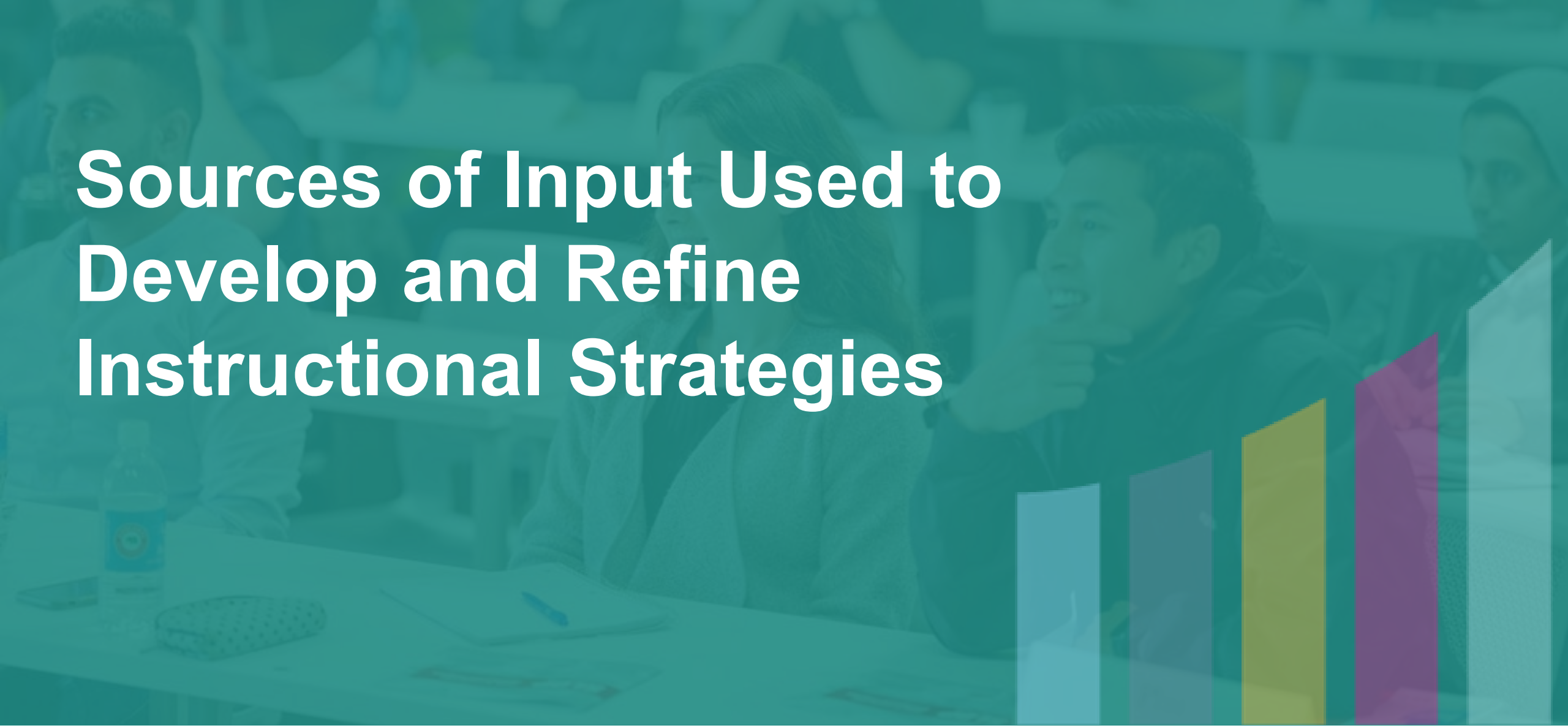
Three SDL processes

I can: Motivational processes provide the foundational emotions and beliefs that energize students' approach to learning. These are the emotions and beliefs around learning.

I plan: Metacognitive processes translate those emotions and beliefs into an action plan. This includes understanding how to manage learning and actively adjust to the demands of any learning task.

I do: Applied learning processes put that plan into action and adjust it as needed. These are learning techniques and self-discipline strategies that help students take greater ownership of achieving specific learning goals.

Sources of Input Used to Develop and Refine Instructional Strategies



Collab Research Activities

Qualitative research to shed light on **institutional policies and practices (IPP)** and instructional environments needed

2021-2022

Rapid cycle experiments (RCEs) to test and refine technology-enabled instructional strategies

2022-2023

Develop and pilot-test an **"instructional model"** that uses tech features to deliver SDL instruction

2023-2025

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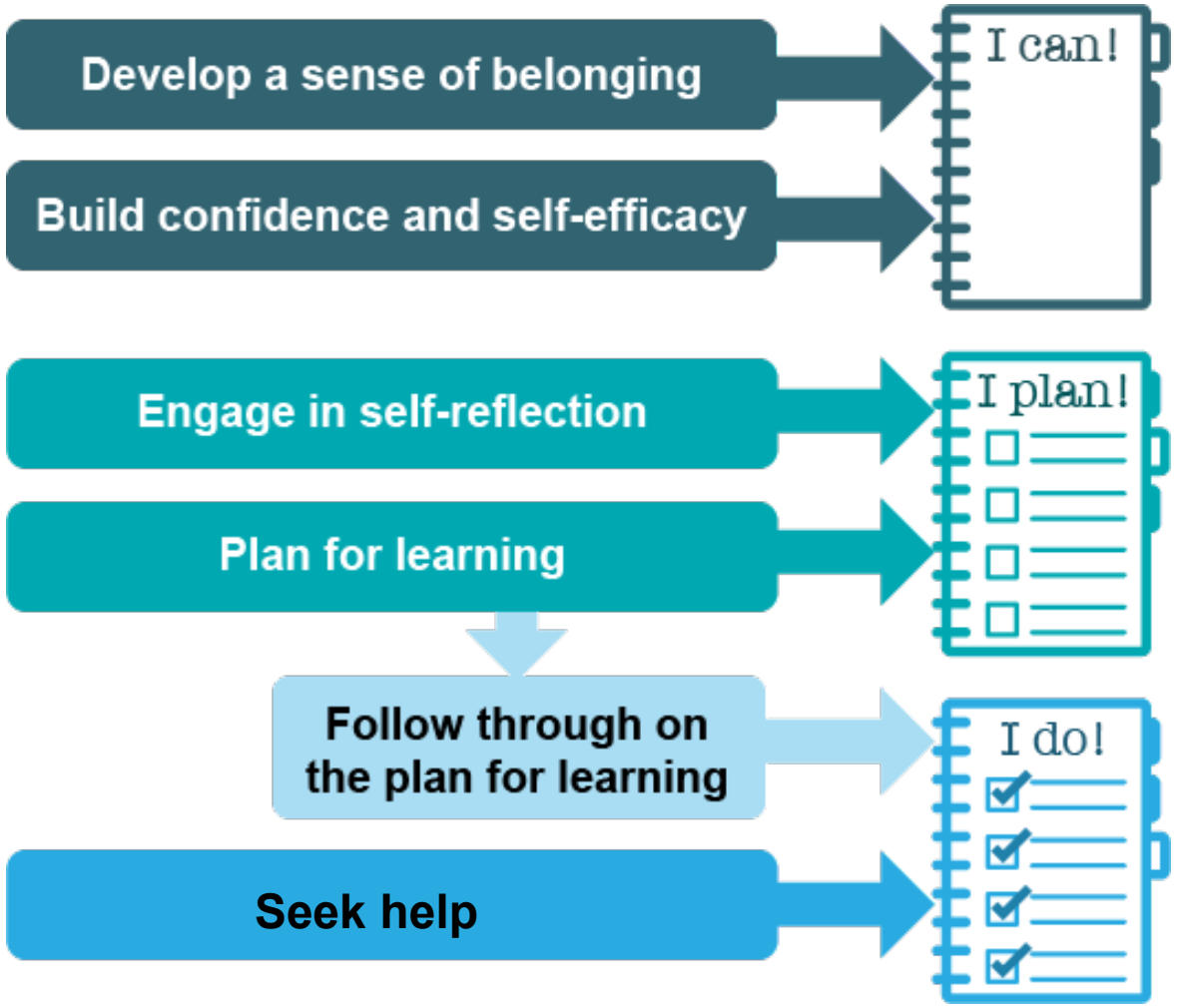
Strategies target 5 student skills



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Strategies co-developed and tested

Strategies were identified via literature review and systematic database review,[1] and co-developed/adapted for online courses with instructors at four partner institutions.

Assign **videos** to support sense of belonging, planning for learning, confidence, and self-efficacy through a growth mindset

Set up automated **prompts** focused on help seeking, task-planning, and reflection

Use technology to support student-peer interaction and networking (**SPIN**) and promote help seeking

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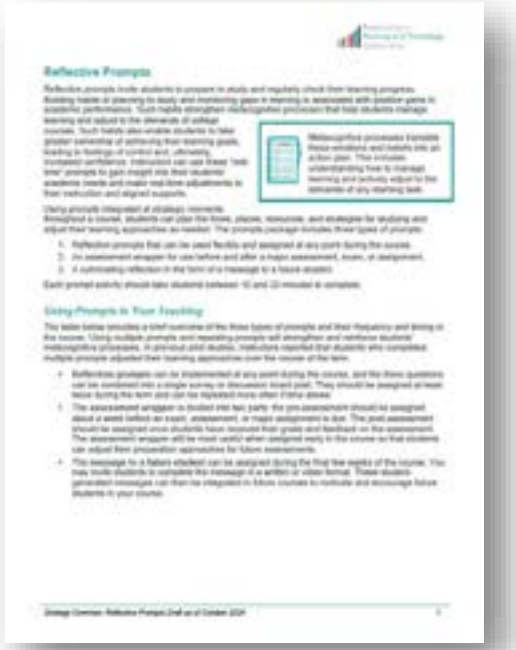
[1] To learn more about the Collaborative's research on instructional strategies, read our white paper at https://postseccollab.org/teaching-and-designing-online-stem-courses-to-support-sdl-skills/.

Resources and guidance

Visit the event page for today's session at https://postseccollab.org/events/ to access draft versions of the instructional strategies and implementation guidance.

Videos

Prompts



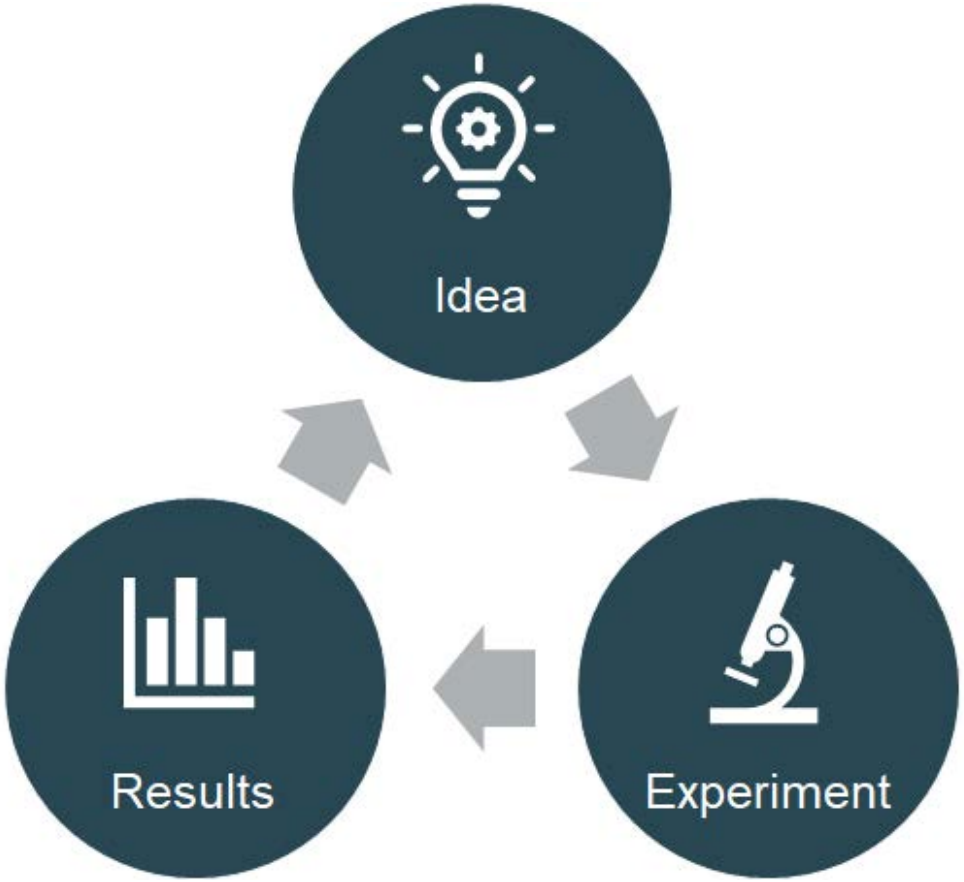
SPIN

What have we learned from testing the strategies?

Rapid cycle experiments (RCEs)

RCEs allowed instructors to test a specific strategy (or combination of strategies) in course sections that are designed to help students develop SDL skills.

Findings from these formative studies, triangulated with other sources, are helping to identify and refine promising strategies to include in our culminating resources.



RCEs by the numbers

4 Institutions

3 Instructional strategies

4 Semesters

24 Instructors

105 Course sections

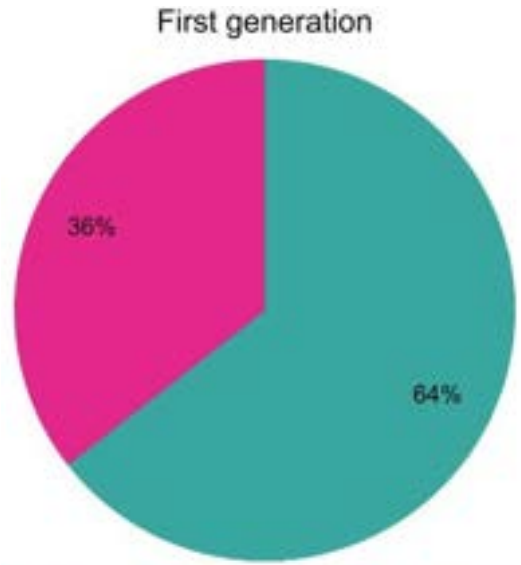
2,000+ Students

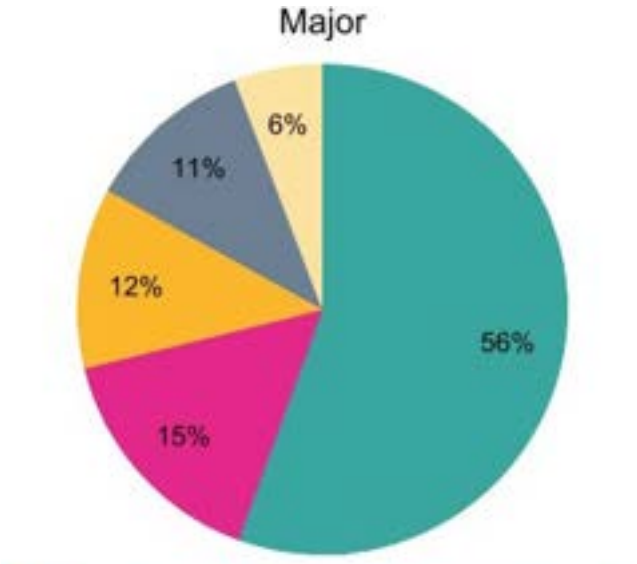
Research questions

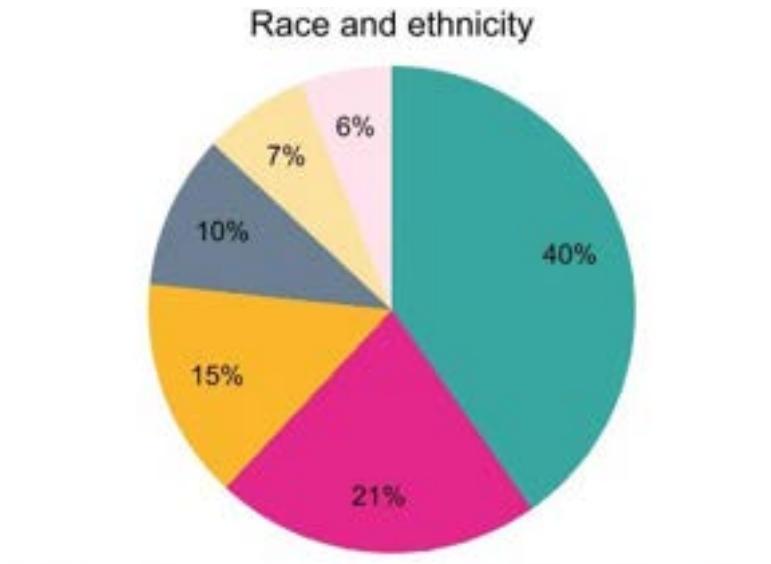
Research Questions
1. Compared to a business-as-usual condition, what is the effect of the opportunity to use a technology-based intervention on students' development and application of self-directed learning skills and academic outcomes?
2. How does this effect vary based on student characteristics?
3. What impedes or assists with the implementation of technology-based instructional strategies to support students' self-directed learning? What are student and staff perspectives on the strategies' strengths and opportunities for improvement?

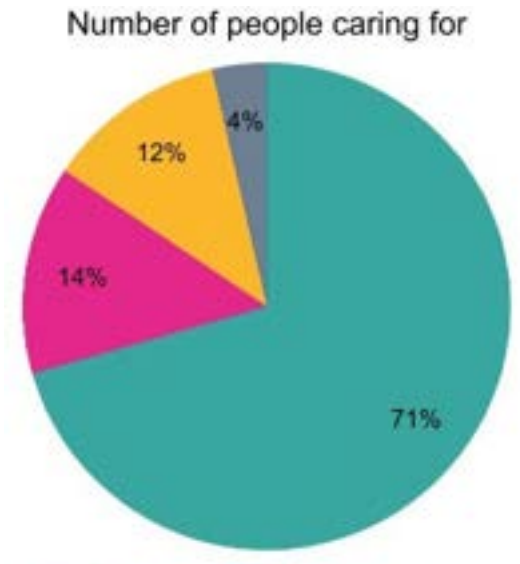
Findings: Survey and Administrative Data

Sample characteristics









Characteristic missing for one institution

Characteristic only available for survey respondents

Characteristic only available for survey respondents

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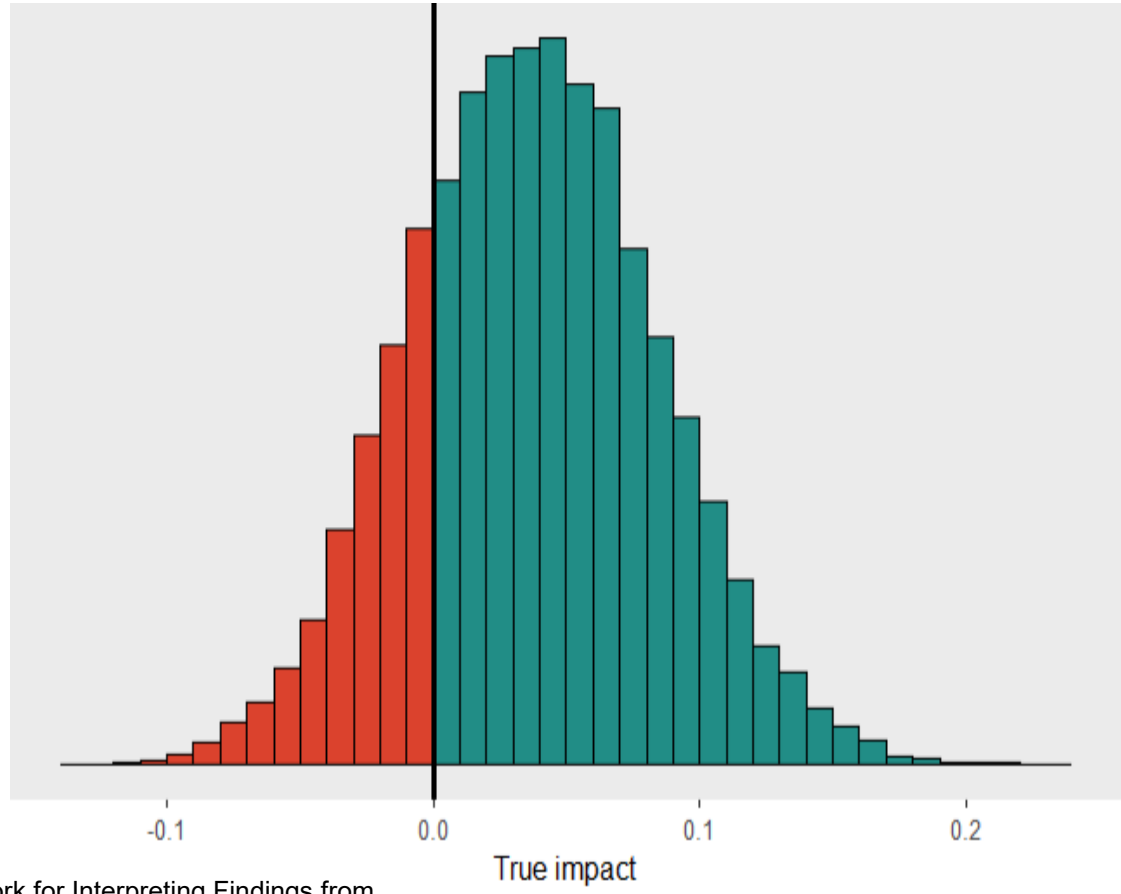
Number of students for admin data: 2,224

Number of students for survey data: 1,363

Probability of positive impact on end-of-course grades

To account for smaller sample sizes, the study team conducted a Bayesian analysis, which incorporates prior evidence on other post-secondary strategies.

There is a 78% probability that our strategies had a positive effect on student achievement, specifically end-of-course grades.



Deke, J., Finucane, M., & Thal, D. (2022). The BASIE (BAyeSian Interpretation of Estimates) Framework for Interpreting Findings from Impact Evaluations: A Practical Guide for Education Researchers. Toolkit. NCEE 2022-005. National Center for Education Evaluation and Regional Assistance.

Findings from Survey

Being in a class implementing 1+ strategies positively impacted

- Students' use of more **learning strategies** (drawing diagrams, revising lecture notes, and revisiting practice problems)
- Whether students **evaluated** their learning strategies

This study found the effectiveness of the strategies were consistent across student populations and across different courses

Outcome Domains	Outcome (* = Admin. Data)	Impact Estimate (*SD*)	*p*-Value	Prob Positive Impact
Achievement	End-of-course grade*	0.05	0.450	78
Applied learning strategy outcomes	Learning strategies inventory	0.16	0.019	83
	Help seeking	0.08	0.314	72
	Time management	0.01	0.916	65
Metacognitive outcomes	Comprehension monitoring	0.08	0.283	81
	Debugging strategies	0.06	0.528	81
	Evaluation	0.21	0.006	98
	Goal-setting	-0.02	0.762	65
Motivational outcomes	Self-efficacy	-0.10	0.188	19
	Sense of belonging	-0.15	0.121	15
	Growth mindset	-0.07	0.341	34

Findings: Instructor and Student Experiences

Insights from instructors

Engagement	Time and Value	Adjustments and Adaptations	Data
• Thoughtful integration into existing activities • Incentives • Variation of pacing	• Worth their time • Informed their insight of student content-related understanding • Less sure if videos had an impact	• Continued participation led to comfort to make adjustments • Adjustments often included change to pacing and focus of reflection questions	• Attuned to course grades, rates of withdrawal and completion • Identified student learning needs

Insights from students

"Learning about other people and what they experience, and finding myself in that same boat."

- Student experiencing Prompts + Video

"That actually helped me think back on what I learned."

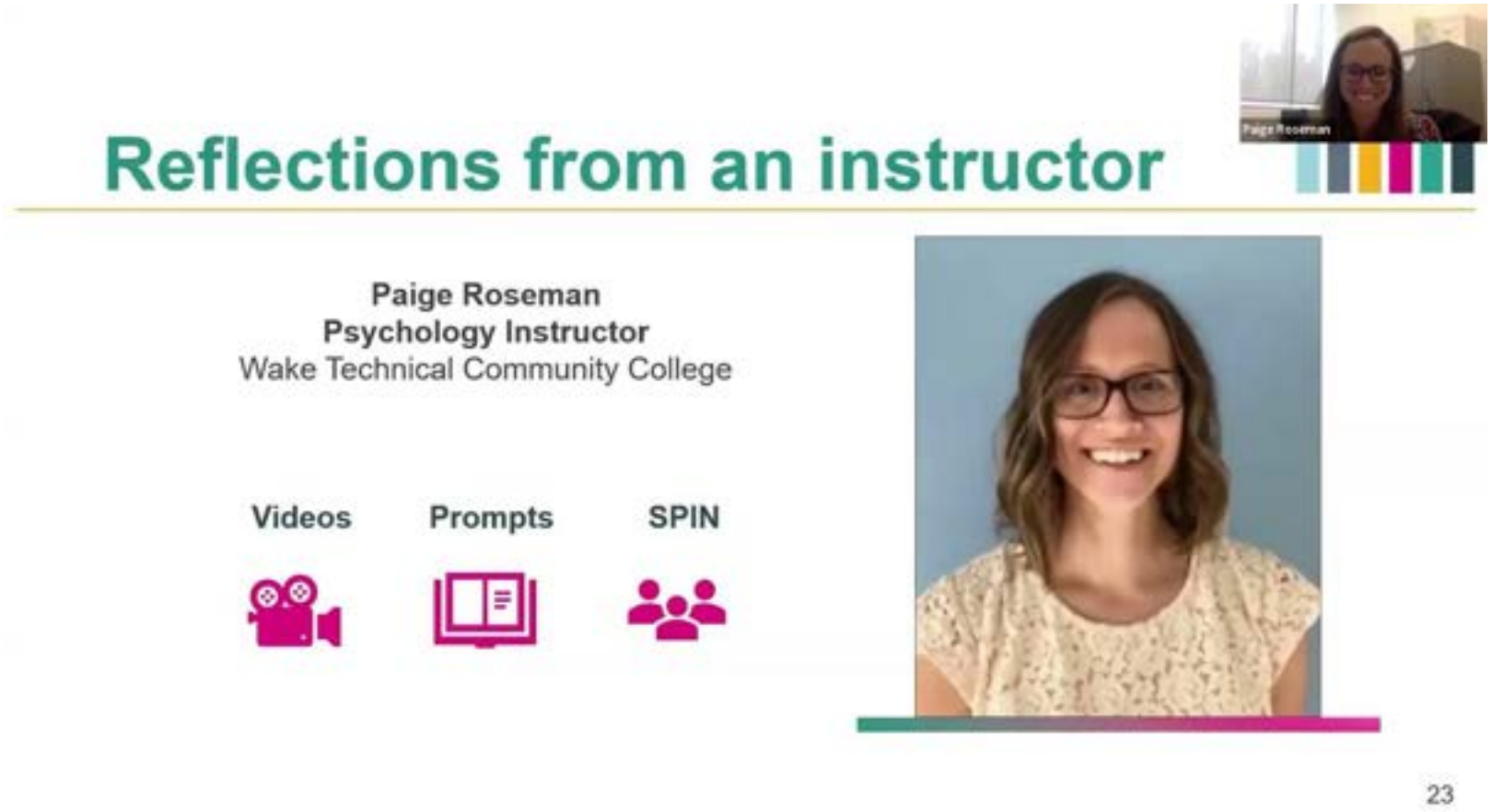
"What didn't you understand so well this week? … When I got asked that question I realized, 'Oh, I really need to study this, because I didn't really understand it that well this week.'"

- Students experiencing Prompts

"I started a WhatsApp group for the class, only I think [with] 8 or so people. I was inspired by one of the videos to start the group."

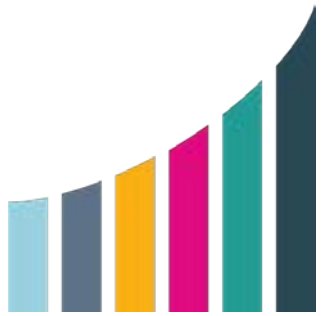
- Student experiencing Video

Insights from Paige Roseman, psychology instructor, Wake Technical Community College



Effective Casemaking

Support for students' SDL skill development likely depends on efforts at multiple levels of the institution



Institution/Departments

- Elevate and prioritize SDL skills
- Develop scaled student supports, online learning resources, and PD opportunities

Faculty/Classroom

- Integrate and contextualize skill supports into courses
- Use culturally affirming and responsive pedagogy and build relationships with students

Casemaking for SDL at Odessa College

- **SDL isn't just about student success—it's about creating a structured learning environment that fosters long-term growth.**
- **Integrating SDL strategies into faculty support structures ensures adoption and sustainability.**

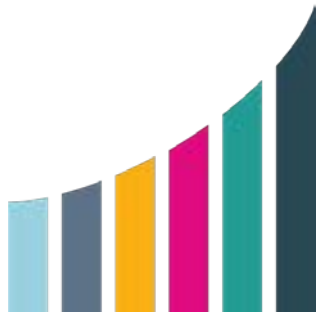
SDL support should be **built into course design and institutional teaching frameworks** rather than treated as an optional add-on.

- **Technology-enabled SDL interventions allow for scalable, institution-wide impact.**

Institutions should maximize **learning management system (LMS) features** to support SDL without adding to faculty workload.

- **Odessa College Leadership Institute** – September 24th-26th

Group Discussion: Pick 1 Topic



Topic 1 – Student experiences in online courses

- What is one strategy–that you have used or have heard others use–to learn about students (and their experiences) in your online courses?

Topic 2 – Strengthening instructional strategies in online courses

- What kinds of strategies do you use in online courses to support student non-cognitive learning about how to learn? In what ways do you think specific or different strategies are needed for online STEM courses?

Topic 3 – Institutional supports for faculty teaching online courses

- How does your institution support instructors in their efforts to address non-cognitive skill development such as SDL skills and mindsets?

Next steps for the Collaborative

- Refining the instructional strategies and integrating them into a comprehensive set of resources, in collaboration with our institution partners
- Piloting the set of instructional strategies in spring 2025 to test their usability, feasibility, and promise for improving student outcomes

Freely available compilation of resources for instructors, instructional designers, and other administrators to implement and institutionalize an integrated set of evidence-based instructional strategies to support students' development of SDL skills and mindsets in online courses

Thank you!

Learn more about what we mean by self-directed learning.

Subscribe to our newsletter.

Find access to instructional strategies here.

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