

Creating Online Environments To Promote Motivation and Learning: Perspectives From Students

SRI Education

Community College Research Center

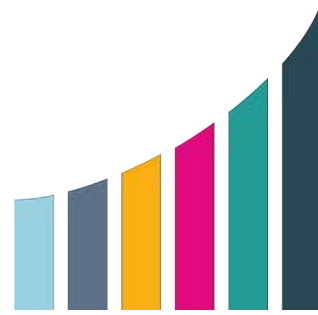
Tulsa Community College





Welcome!

Presenters



Krystal Thomas
SRI Education

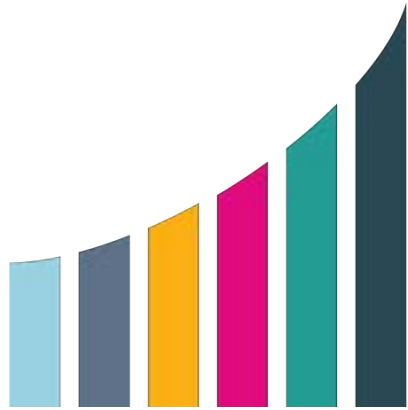
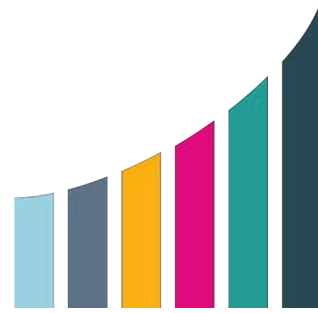


Akilah H. Thompson
Community College
Research Center
(CCRC)

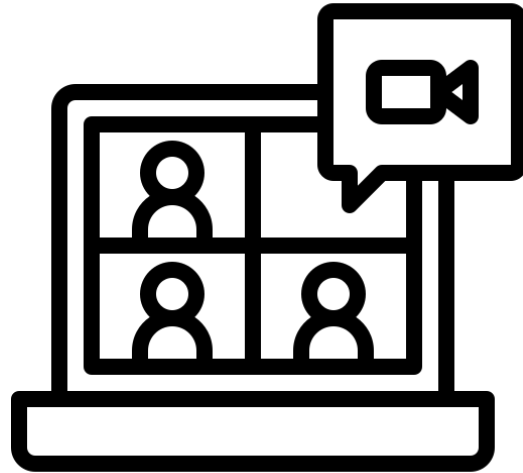


Jill Taylor
Tulsa Community
College (TCC)

For today's presentation we will...



Share a brief overview about the SDL & the Collaborative



Share an instructional example of an online classroom teaching practice



Elevate the student voice and their experiences



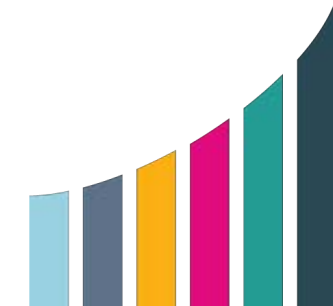
Discuss takeaways and supports for instructors

What is the Collaborative?

A 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 courses.



Postsec Collab: Who we are



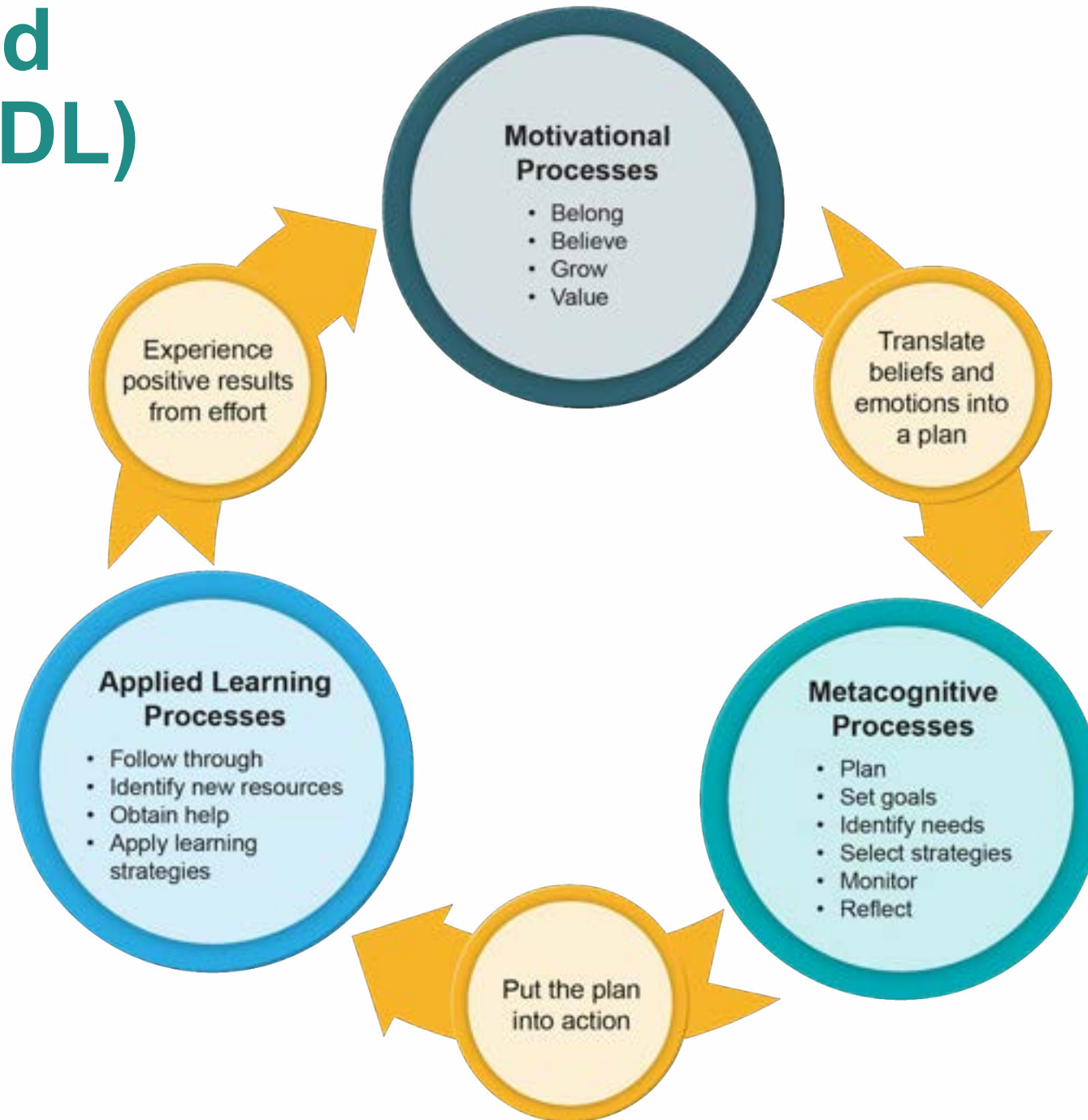
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CCRC COMMUNITY COLLEGE
RESEARCH CENTER
TEACHERS COLLEGE, COLUMBIA UNIVERSITY

**Achieving
the Dream**

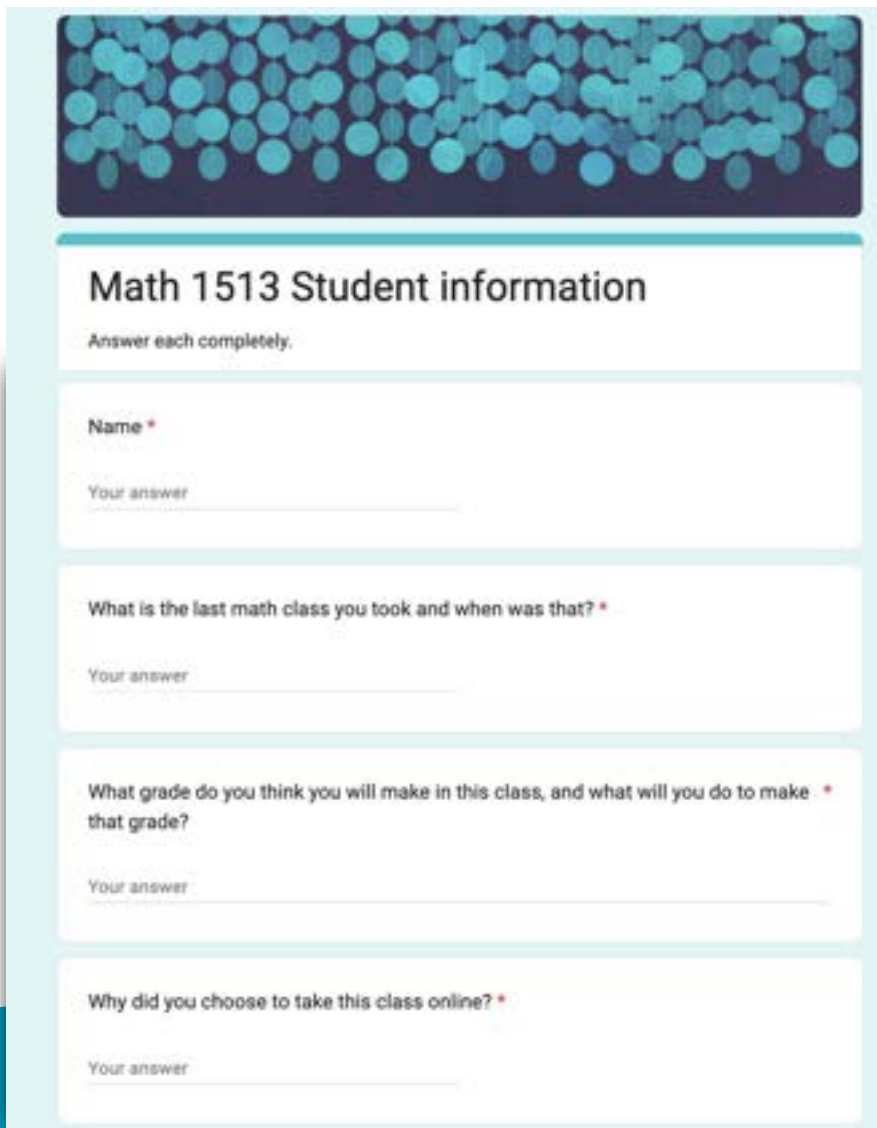


Self-Directed Learning (SDL) skills are mutually reinforcing



Applications Aligned to the Framework to Promote SDL: Group Activities

Introduction Survey: Google Form



Math 1513 Student information
Answer each completely.

Name *

Your answer

What is the last math class you took and when was that? *

Your answer

What grade do you think you will make in this class, and what will you do to make that grade? *

Your answer

Why did you choose to take this class online? *

Your answer

Setting Expectations: Interaction

Build a sense of belonging

- Survey: Student Information (using Google Forms) share commonalities
- Sample Questions:
 - Why did you choose online?
 - What is the last math class you took and when was that?
 - What grade do you think you will make in this class, and what will you do to make that grade?

Setting Expectations: Interaction

Build a sense of belonging (cont.)

- Introduction Slide Show: [link](#) (using Google Slides)
- Introduction video

Introductions

Walton APSI June 26-29, 2023

Choose a slide, then add your info and a picture.



Me with my grandson, Sam

Jill Taylor

State where you teach: Oklahoma

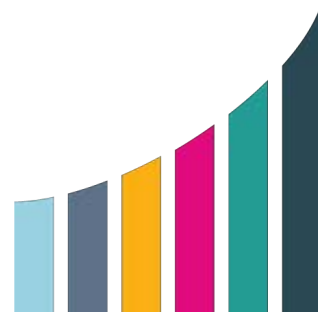
School: Broken Arrow High School

Years teaching: 22

Something interesting about yourself:
I'm a big sports fan. My favorite sport to watch is baseball. Go Astros!



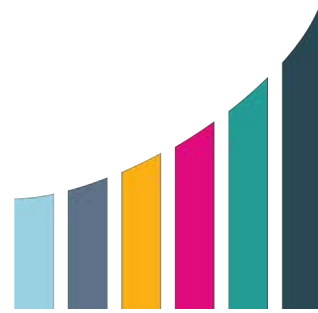
Challenges



- **What factors contribute to challenges for students in STEM courses, especially online?**
 - Feeling alone, overwhelmed, lack of interaction
- **Students seeking help**
 - Invite students to campus: group study, tutoring center, one-on-one
 - Set up study groups for those who are interested
- **Defining the Struggle: Challenges of group activities in Online Courses**
 - Better breakout rooms
 - § Leader, Activity, Choice, Share Screen, Direction/Goal



Engaging Students: Examples of Group Activities



Unit Content Discussion

- On **Jamboard**, students collaborate in groups to...
 - Unit Overview
 - Pre-made activity
 - Ask questions
 - Brainstorm

Unit 1 Content Discussion

Take 10 minutes and look thoroughly through Unit 1, pages 31-50 (pdf pages 39-58), in the AP Precalculus CED. Are there any surprises, additions, or omissions you notice when thinking about your current Precalculus course?

Surprises

- It seems like some Algebra 2 concepts (zero of a function, multiplicity, etc) are being explained seems to assume students are not getting these in A2?
- Limit Notation
- "Global" max/min. I'm used to "absolute" max/min. Different terminology...
- Frequency of sinusoidal functions was not in my last book (reciprocal of period).
- "Input/output vocabulary is necessary."
- Using limit notation to describe the end behavior of a polynomial function
- The phrase "dominates the polynomial" is an idea we've used, but new terminology

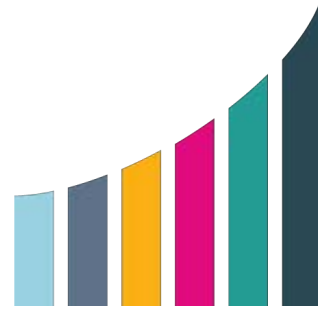
Additions

- Using Dilation instead of Stretch or compression
- Frequency of sinusoidal functions was not in my last book (reciprocal of period).
- Just the wording of input and output--will have to use more
- Discussed terms like "point of inflection" and "concavity" are being used
- Concavity
- Use of real-world data sets instead of only "math book" type problems
- Relating "rate of change" to concavity.
- Regressions of a variety of function types
- We haven't been talking about average rate of change in precal
- While we have always called it "precalculus", the strong theme of rate of change on topics seems to make the course more conducive to preparing for Calculus
- Rational function end behavior @ asymptotes

Omissions

- Domain and Range (See Topic 1.12 for domain and range)
- Operations with Rational Functions
- Synthetic Division
- Domain and Range
- Polynomial long division is relied upon over synthetic division. PLD has its uses, but most of our divisors will be linear.
- Inverse functions are usually a unit 1 topic for my precalculus classes in the past
- Domain and Range (See Topics 1.1, 1.12 for domain and range)

Engaging Students: Examples of Group Activities (Cont.)



Instructor Made Videos:

- Record videos of
 - Notes for each section
 - Help videos for homework
- Students can access these videos through the LMS
- Provided for **asynchronous** and **synchronous** classes

The screenshot shows a YouTube video player displaying a handwritten solution for the integral $\int \frac{\sqrt{25x^2 - 36}}{x^2} dx$. The work is titled "8.4 Help video".

The steps shown are:

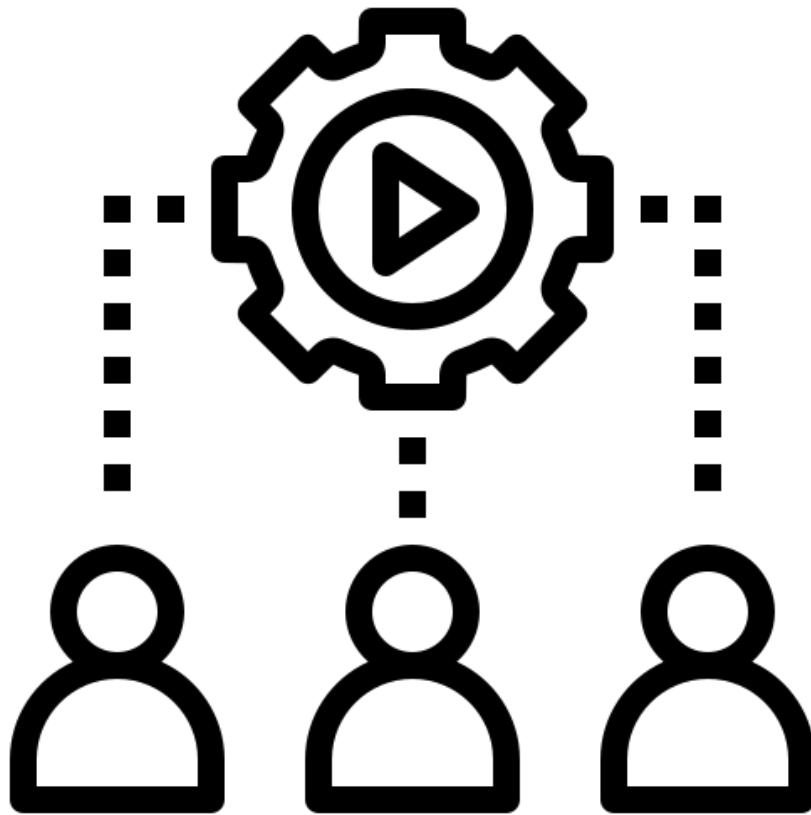
- Original integral: $\int \frac{\sqrt{25x^2 - 36}}{x^2} dx$
- Substitution: $(5x)^2 - 6^2$, $5x = 6 \sec \theta$, $x = \frac{6}{5} \sec \theta$, $dx = \frac{6}{5} \sec \theta \tan \theta d\theta$
- Substituted integral: $\int \frac{\sqrt{(6 \sec \theta)^2 - 6^2}}{(\frac{6}{5} \sec \theta)^2} \cdot \frac{6}{5} \sec \theta \tan \theta d\theta$
- Simplified integral: $\int \frac{6 \tan \theta}{\frac{6}{5} \sec^2 \theta}$
- Trigonometric simplification: $\sqrt{36 \sec^2 \theta - 36} = \sqrt{36(\sec^2 \theta - 1)} = \sqrt{36 \tan^2 \theta} = 6 \tan \theta$

The video player interface includes a search bar, browser tabs, and a video progress bar at the bottom. The video title is "Calc 2 - HELP on 8.4 HW".

Student Voices: Benefits and Barriers to Online Group Activities



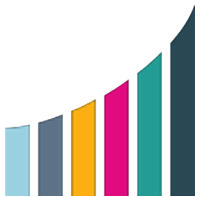
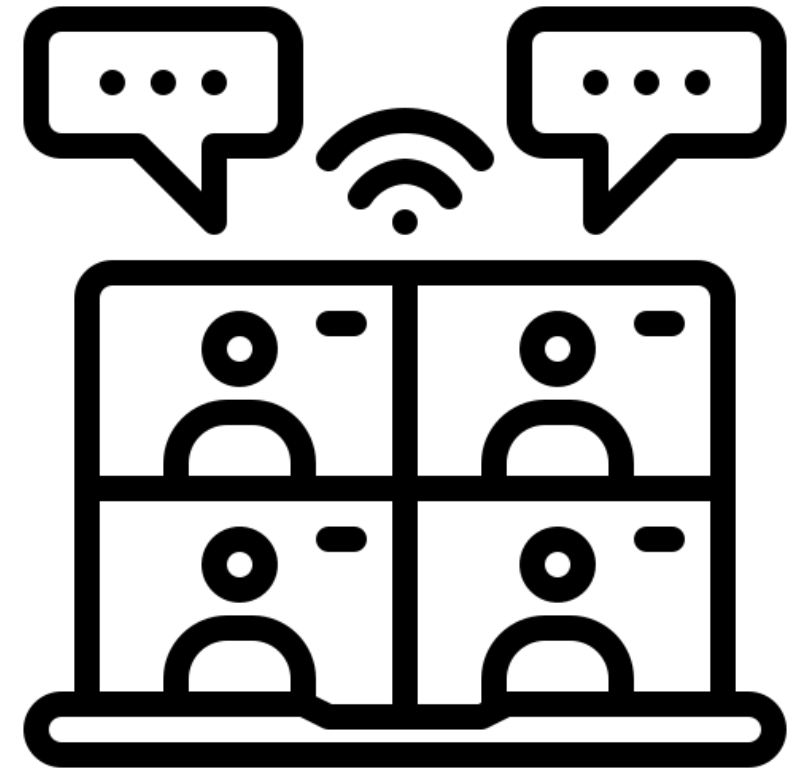
Student perspectives on group activities



- Students shared their **varying experiences** with group assignments.
 - "...When it comes to groups, I don't like doing groups. I'd rather just do everything **by myself.**"
- Working with other students can make it harder for students who like to learn independently.
 - "...[I like going at] my own pace. That's why we're doing online [...] I don't have to worry about getting behind..."

Student experiences in online courses

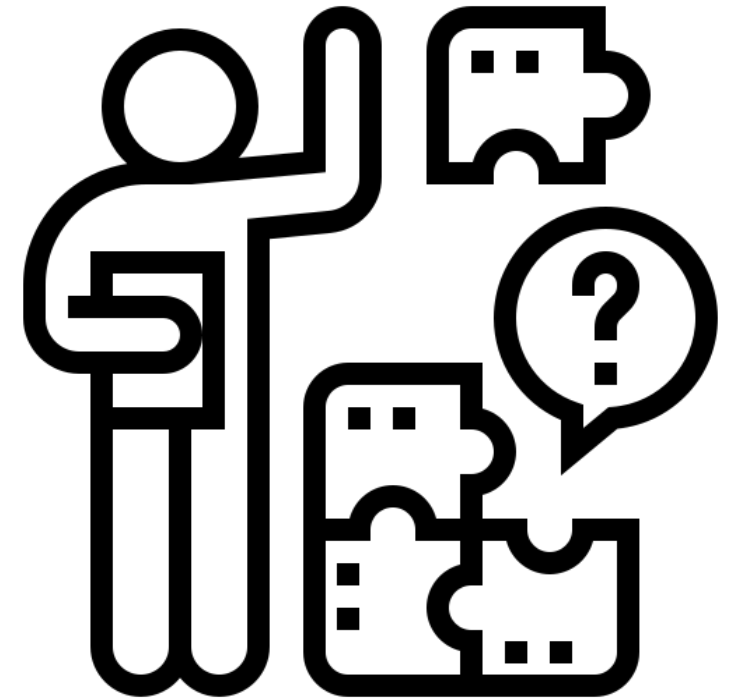
- Opportunities for peer interaction can **increase motivation and connectedness**.
 - "...The breakout rooms only [...last], about 15 minutes and [then]...it goes back to the original class [...] so, you're not talking too long...You don't get [enough time] to **chit chat**..."



Student perspectives on Motivational Processes



- Students reported **increased motivation and a sense of belonging** when they knew other students were struggling in the course.
 - “[Knowing that] you're all on the **same page**, [...] it's nice to have that.”
- Students appreciate **structure and roles** with group work:
 - “... I do like group work, but it depends on the group. [...] If you get people that just like, **drag their feet**, you know, it's probably one of the most frustrating things in school.”



Student perspectives on Applied Learning Processes



- Collaborating with peers **increased confidence** in seeking help from instructor:
 - “... [It] was helpful to be able to talk to other students and [...] **teach each other** the material. [When we realized] we didn't know something...we would **ask the professor** at the next meeting.”



Takeaways and Considerations

Supporting Instructors with Strategies for Student SDL Skill Development



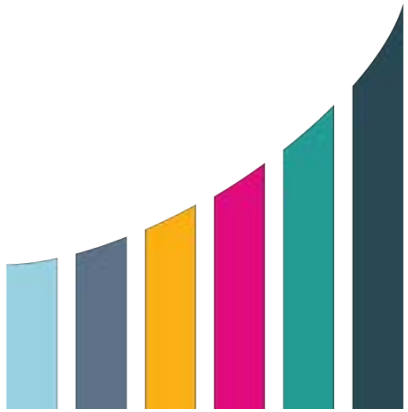
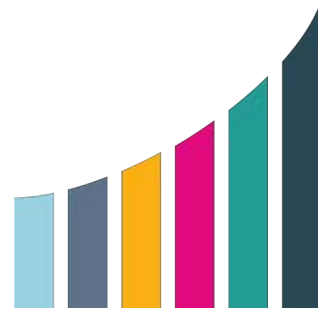
- **Institutional Supports**

- Access to equipment and resources
 - Computer labs
 - Accessible testing sites
- Professional development to support specific training
 - Include student perspective via panels

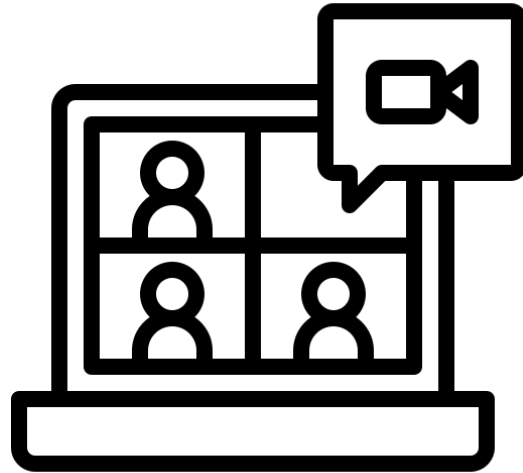
- **Equity Considerations**

- Affinity-based efforts to promote help-seeking
- Varied options to promote sense of belonging and community
- Student choice about taking online courses

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Discussed takeaways and supports for instructors

Questions?





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