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A framework for self-directed learning strategies in online learning

OLC Innovate
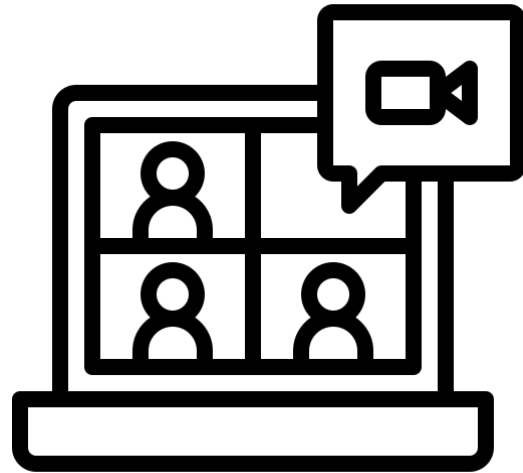
April 12, 2024

Welcome!

Let's see who is joining us today.

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For today's session we will...

Share an overview of the Collaborative

Online STEM learning context and challenges

Strategies to support self-directed learning skills & mindsets

Group discussion

What is the Postsecondary Teaching with Technology 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

SRI Education™
A DIVISION OF SRI INTERNATIONAL

CCRC COMMUNITY COLLEGE RESEARCH CENTER
TEACHERS COLLEGE, COLUMBIA UNIVERSITY

Achieving the **Dream**

Portland State University*

Calbright College

Tulsa Community College

Macomb Community College

Bunker Hill Community College*

Virginia State University*

Odessa College*

Wake Technical Community College

Palm Beach State College*

*Minority Serving Institution

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Online STEM learning context

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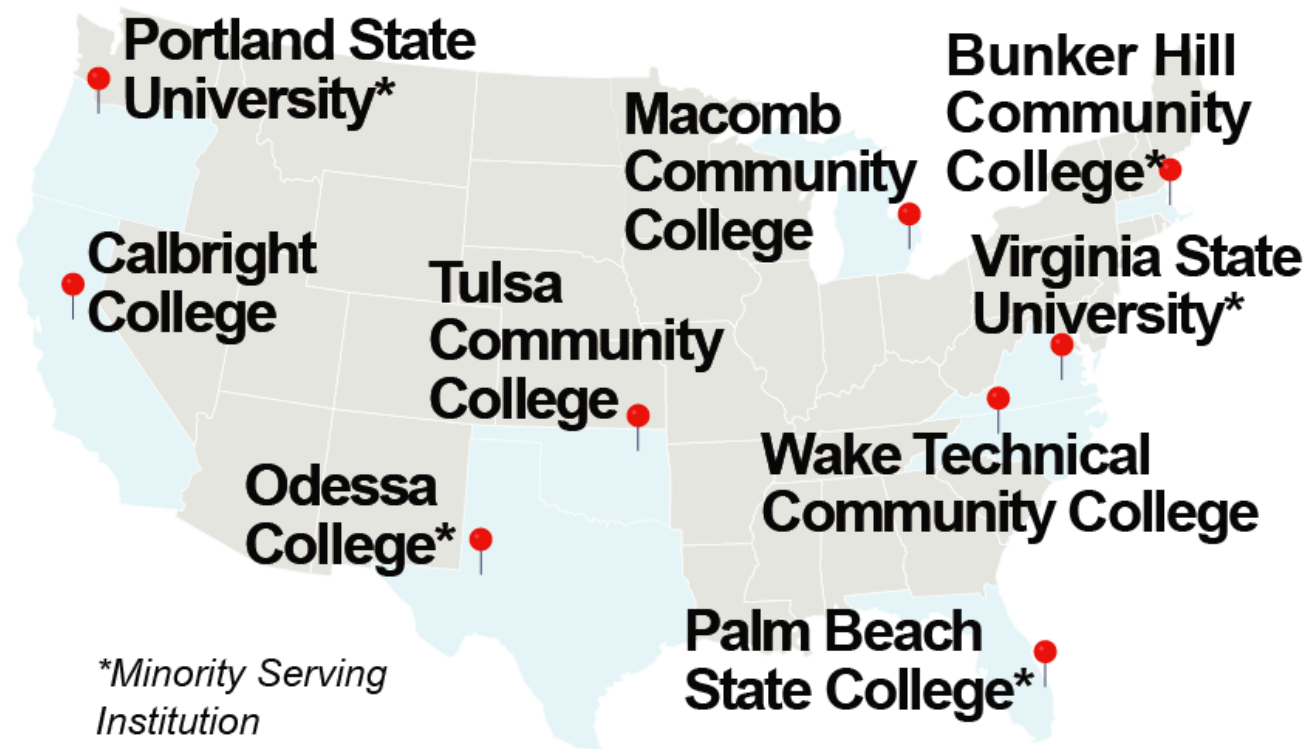
Research shows

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 encounter numerous barriers to success in STEM

Unwelcoming environment

Belonging uncertainty

Individual sink or swim culture

Stereotype threat

Content heavy

Inequitable opportunities to develop self-directed learning skills
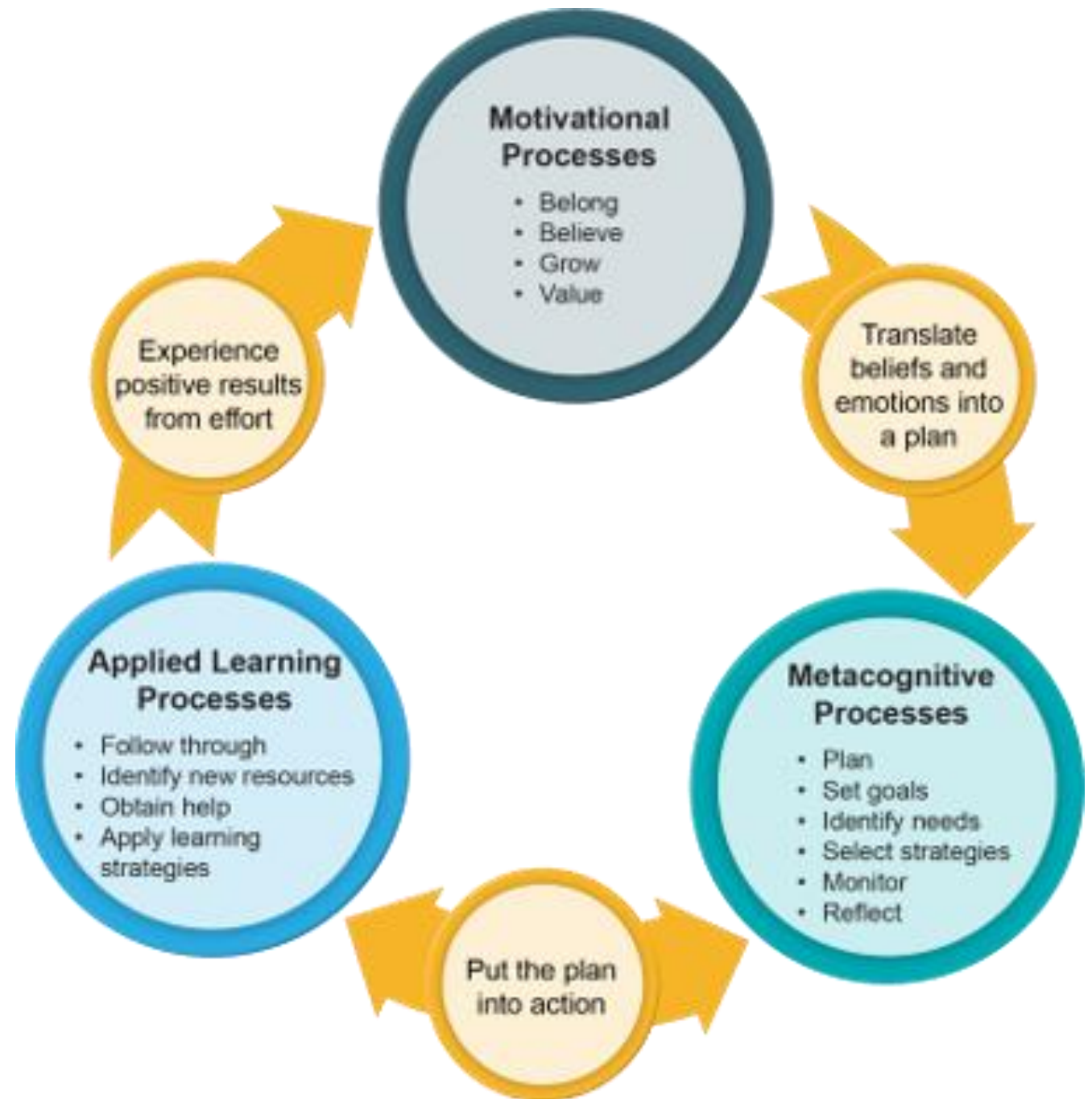
Unclear personal relevance

Feelings of isolation exacerbated in online formats

What is often missing: support for students' self-directed learning capacities

Motivational Processes
- Belong
- Believe
- Grow
- Value

Translate beliefs and emotions into a plan

Metacognitive Processes
- Plan
- Set goals
- Identify needs
- Select strategies
- Monitor
- Reflect

Put the plan into action

Applied Learning Processes
- Follow through
- Identify new resources
- Obtain help
- Apply learning strategies

Experience positive results from effort

Proposed approach: instructional strategies to support self directed learning

- Developing and testing strategies informed by practitioners and research

- Hypothesize benefits to embedding supports in classroom settings

Student Needs in Online Courses

In your role, how do you work to:

- Increase students' motivation
- Help students reflect on their learning
- Help students study more effectively/efficiently

What kind of strategies or resources do you use?

Areas where our researchers identified opportunities for building in SDL

- **Introduction/Start Modules and Syllabi:** Instructors creating course introduction videos and providing more opportunities for students to interact more can build on sense of belonging or motivation

- **Before and after assignments:** Building more reflection opportunities for students to understand how they are learning

- **Discussion Boards:** Prompts and incentives to encourage interaction in discussion boards or forums.

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Promising examples of <u>sense of belonging</u>

Introductions Forum

- **Beginning of the term, students respond to a video about how they view themselves as math students**

- **The instructor created an introduction thread as well**

Hi Everyone
Posted by: <u>Maritza Cakmak</u>, Tue, Sep 5, 2023, 8:30 pm

Hide | Reply

Hi! My name is Maritza. I am currently enrolled in the Visual Design. I am currently working as a full-time Pre-K teacher, a full-time student and a part-time retail employee. Needless to say life is busy. I like math but I am terrible at it. I see math as a puzzle that needs to be solved. I am excited, nervous and terrified about the semester all rolled up into one. But look forward to stepping up to the challenge.

Re: Hi Everyone
Posted by: ___tney Fa, Wed, Sep 6, 2023, 12:05 am

Hide | Reply

Hi Martiza!!

You definitely sound like a busy person! I find that I am not the best at math either but I look forward to taking this class and the chance to learn lots!!
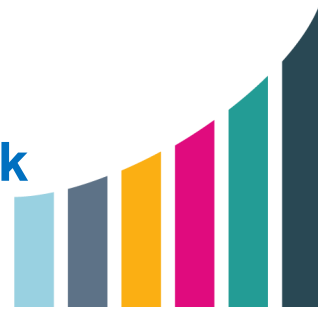
Best of luck ___!

W___

Re² : Hi Everyone
Posted by: <u>Maritza Cakmak</u>, Wed, Sep 6, 2023, 5:31 pm

Hide | Reply

Thank you so much! You as well, wishing you a great semester.

Promising example of <u>planning</u>

- **Weekly schedule (called "Weekly Lesson Flow") so students can plan out their work accordingly**
- **Calendar that displays upcoming assignment deadlines**

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Promising examples of **help-seeking**

"Ask a Question, Answer a Question!" Class Forum

- **Students post math questions they need help with and are encouraged to assist classmates by sharing the process, not by giving the answer**

- **The instructor is timely in responses to students**

- **Instructor has created an environment for students to feel comfortable to reach out for help and to help others**

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Interventions we are testing

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Video series

| Sense of belonging | Time management | Growth mindset |

Each video follows a consistent structure:

- Overview of what you will learn
- Introduction to the SDL skill/mindset
- 2-3 strategies to develop the SDL skill/mindset
- Where to find additional resources

Each video includes a reflection activity:

- Self-rating on SDL skill/mindset
- Self-reflection on strategies presented in the video
- Planning for how to apply

Automated prompts

Required SDL prompts
• What assignments and other coursework do you need to complete this week for this class? What information, resources, or help do you need to complete this week's coursework?
• Have you scheduled a specific time to complete this week's work for this class? [If no] When will you complete this week's work for this class?
• What questions from your last [assessment] did you not understand? What resources and strategies do you need to improve your understanding?   • [Includes customized list of resources for each institution]
• Which concepts from this class do you feel you mastered this week? Which concepts are you still struggling with?

What have we learned?

Video Implementation Results

Student Experience

- Students engaged meaningfully

- Students outlined concrete strategies to implement

- The biggest challenges students included the lack of interest of their peers to engage in the class and group work.

Instructor Experience

- Instructors overwhelmingly found videos straightforward to implement.

- Instructors most often embedded the videos into their class LMS

- Instructors found the topics of the videos important.

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Prompt Implementation Results

Student Experience

- Most students responded to most of the prompts offered during the semester.

- In general, most students reported positive experiences with the prompts.

- Many students reported the prompts became repetitive

- In response to this, we encouraged instructors to adapt prompts

Instructor Experience

- Instructors overwhelmingly found prompts straightforward to implement.

- Instructors overwhelmingly implemented prompts using their LMS

- Instructors that chose to use content-specific prompts reported learning about students' understandings from these prompts.

- Instructors found prompts easy to adapt to meet their courses needs.

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Impacts on survey outcomes and academic achievement

Key takeaways

- Small sample sizes: no impacts were statistically significant at the 5% level,

- Evidence of promise: For course grades, learning strategies, and evaluation, the estimate is positive and relatively large

- Meaningful probability of positive effects: 82% probability of positive effect on grades; 78% for evaluation, 54% for LSI

Note: Preliminary results as of April 2024.

		Effect Size (SDs)	
Academic achievement	End of course grade	0.12	
Applied learning strategy	Help seeking	-0.01	
	Learning strategies inventory	0.11	
	Time management	0.05	
Metacognitive	Comprehension monitoring	0.07	
	Debugging strategies	-0.11	
	Evaluation	0.14	
	Goal-setting	-0.03	
Motivational	Growth mindset	-0.00	
	Self-efficacy	-0.07	
	Sense of belonging	-0.08	

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Key measures from Learning Management System (LMS) data

Engagement with tested strategies

For each student with each prompt/video:

Measure	Definition
Action count	Total number of actions associated with the video/prompt throughout the semester.
Total time	Total duration (in minutes) of actions associated with the video/prompt throughout the semester.
Reaction time	Time lag (in hours) between the release of the video/prompt and the current student's first action associated with it.

SDL behavior

For each student in each course-week:

SDL process	Measure
Comprehension monitoring	Action count: course info
Performance	Action count: learning content
	Study session count
	Action count: assessment
	Average session duration
	Active day count
	Average session gap
Appraisal	Action count: feedback

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Emerging findings based on LMS data

- Compared to their peers, systemically marginalized students were more actively engaged with strategies, especially prompts

- Positive correlation between videos/prompts and SDL behavior

- Stronger relationship for systemically marginalized students of STEM

Based on two institutions across Fall '22 and Spring '23

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Group Discussion

Group 1 – Student experiences in online courses

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

Group 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?

Group 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?

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SDL Development and Growth

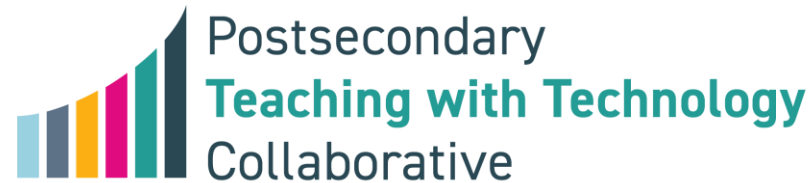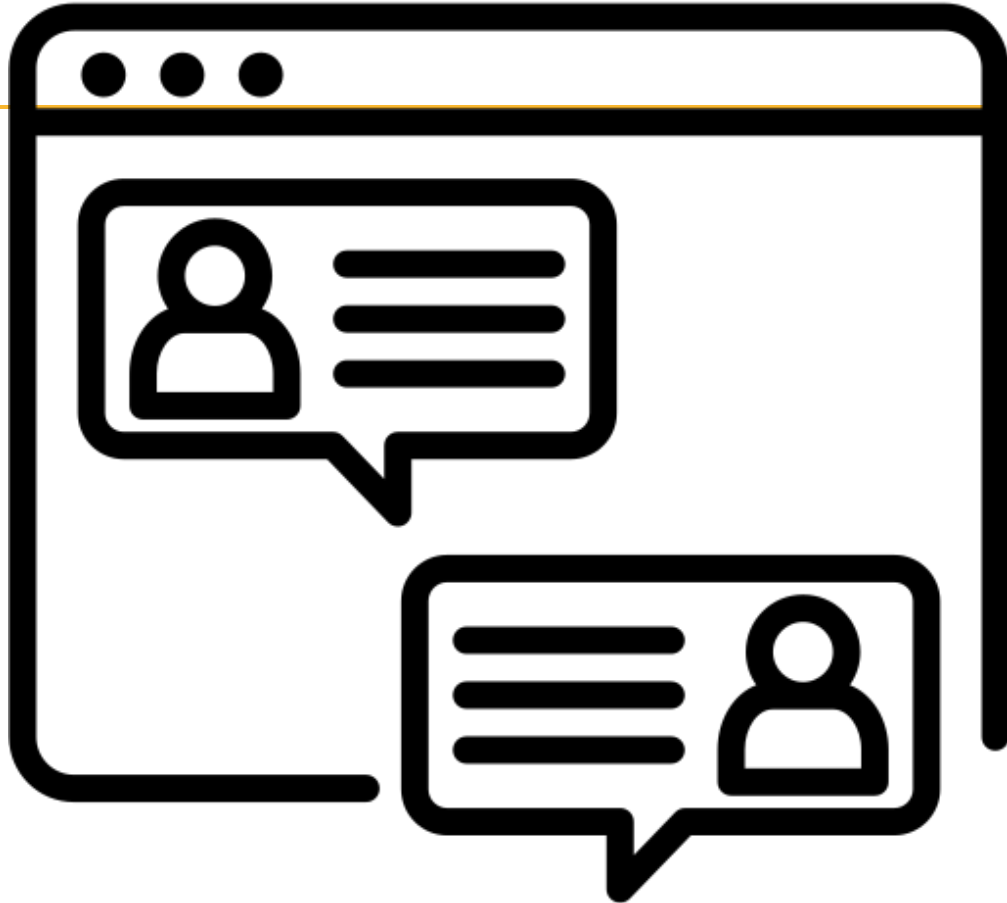|	Set the foundation	Practice and develop SDL skills
Motivational Processes	• Building sense of belonging, self-efficacy and growth mindset • Assessing personal value of course	• Maintaining positive mindset • Maintaining connection to peers and instructor
	Course Progression →	
Metacognitive Processes	• Using planning processes to schedule study time, identify learning needs, set goals, and select initial learning strategies	• Monitoring progress • Adjusting learning strategies • Reflecting on completed performance and lessons learned
	Course Progression →	
Applied Learning Approaches	• Enacting time management plan • Setting up the study environment • Identifying additional resources to support learning	• Obtaining help • Spacing practice to retain knowledge • Self-quizzing • Active learning and note taking • Using problem solving heuristics

Thank you

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Achieving the Dream™

Student Voices: Perspectives on Motivation

- Building caring and supportive relationships with their instructors helped them to **succeed** and **boosted their confidence**

- Students' motivation and a sense of belonging increased when they knew other students were **struggling** in the course.

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Student Voices: Perspectives on Time Management
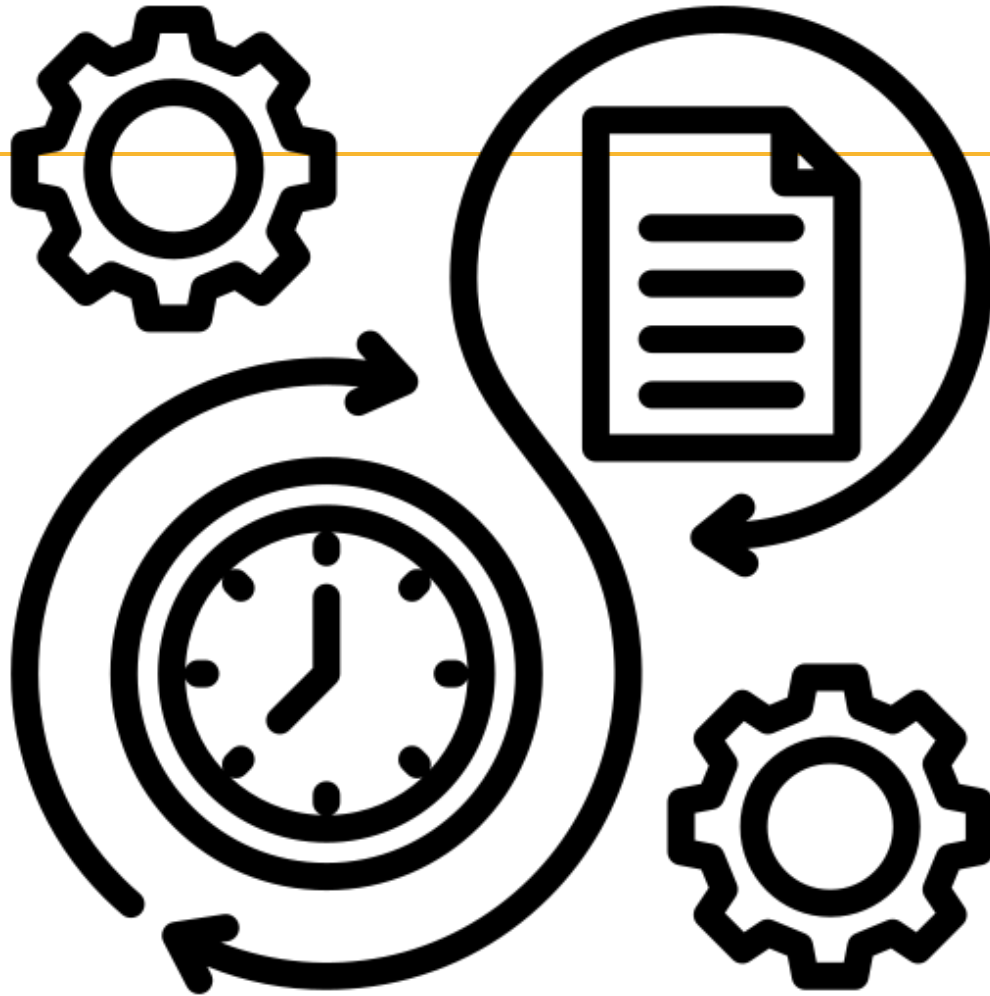
- <u>Help with time management:</u> "I'm trying to find different methods to help me with getting [better] studying...I still don't know how to manage my time properly...**I wish there were classes for that.**"

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Student Voices: Perspectives on Help-Seeking

- <u>More support for help-seeking:</u> "If I email any professor about something I don't understand, [they would] respond to me within two days sometimes."

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