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Community in the Online Science Classroom

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Community in the Online Science Classroom

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Nearly half of undergraduates at public institutions are enrolled exclusively in online courses.

+

Flexibility

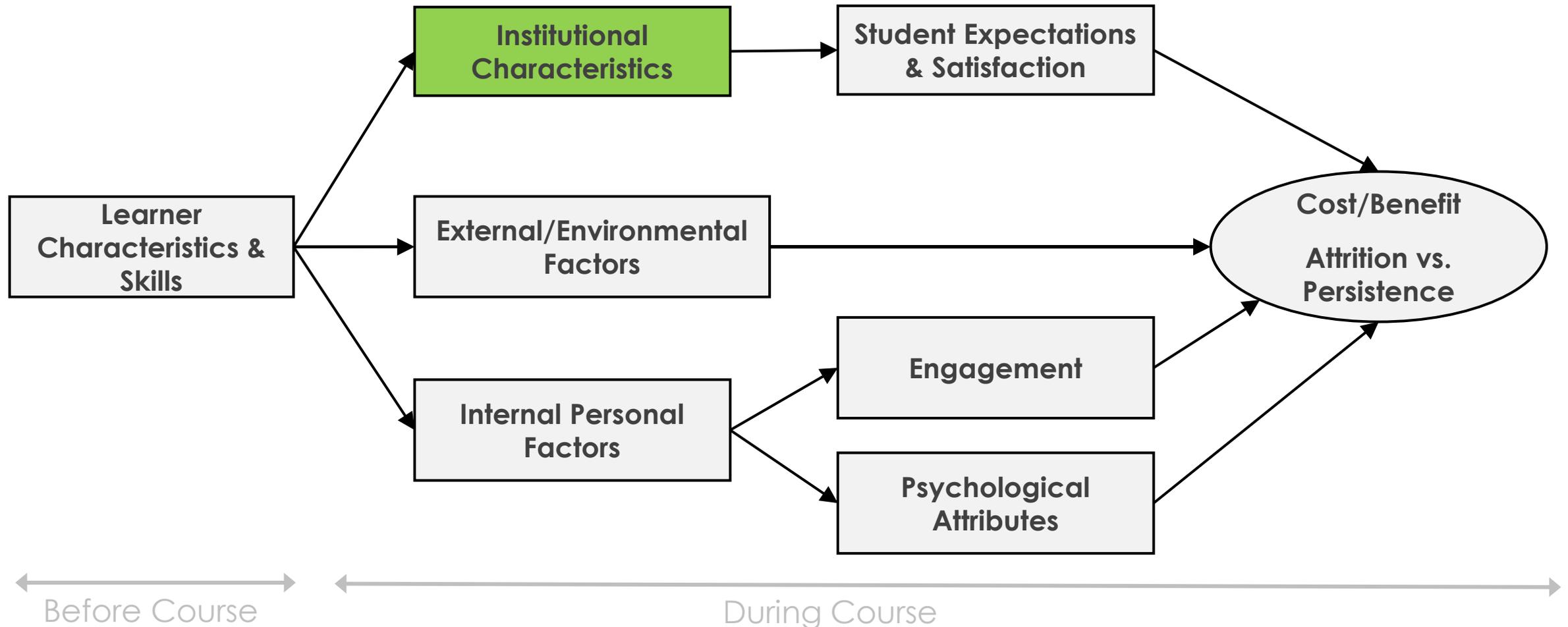
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Persistence



Understanding student persistence in online learning is complex.

Tinto's Student Integration Model, Bandura's Social Cognitive Theory, and Bean's Model of Student Departure



Asynchronous online classes often use discussions to establish a learning **community**.

- Idea exchange
- Content focus
- Critical thinking
- Problem solving
- Collaboration
- Peer feedback



Learners & instructors project their personality into the community through social presence.

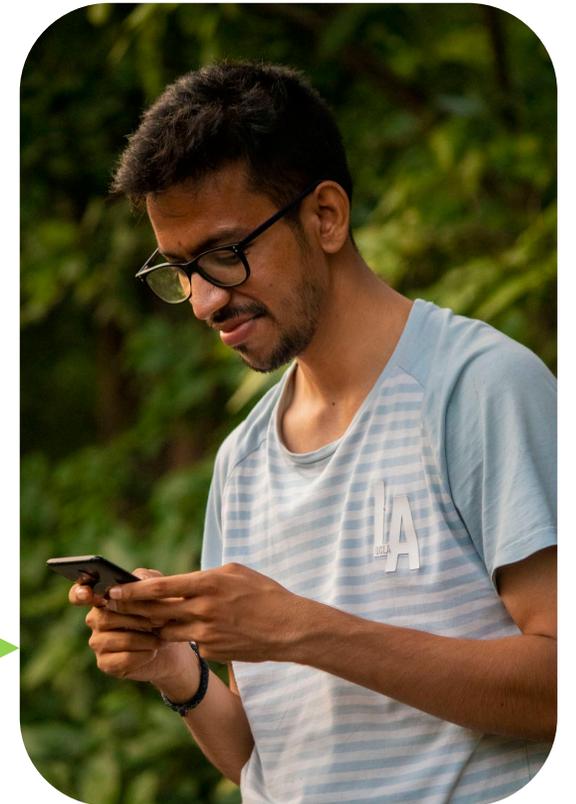
Affective responses

Interactive communication

Cohesive responses



Peer Support Hypothesis



Teaching presence occurs through key instructor actions in the community.

Instructional design & organization

Direct instruction

Facilitating discourse



Students' cognitive presence in online courses can be predicted by social & teaching presence.

Triggering event



Integration



Exploration



Resolution



Self-Reflect: On the “cat” scale, what is the status of community in your classroom?



To vote, use QR code or go to www.menti.com and use the code **2189 1812**.

Community can have a powerful impact on students.

Combat isolation

Active, constructive, and interactive learning

Teaching presence in online STEM courses correlates to persistence.

- Influence of social persistence debated
- Evidence of correlation with cognitive presence in non-STEM online courses



We should be aware of the cognitive load associated with online discussions.

Intrinsic load: understand the task

- task complexity
- task environment

Extraneous load: interact with learning materials

- material presentation

Germane load: create new knowledge schema



Hypothesize: Rank the discussion tasks from highest to lowest cognitive load.

✓ Understanding expectations

✓ Crafting initial post

✓ Reading posts

✓ Creating reply posts

✓ Integrating instructor feedback

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The tasks with highest cognitive load were crafting the initial post and understanding expectations.

	Mental Demand	Temporal Demand	Performance	Effort	Frustration
Understanding what is expected	0.241	0.138	0.089	0.248	0.026
Crafting your initial discussion post	0.349	0.245	0.201	0.201	0.154
Critically reading posts from your instructor and peers	-0.280	-0.191	-0.015	-0.208	-0.060
Creating reply posts	-0.171	-0.099	0.021	-0.068	-0.020
Integrating instructor feedback into future discussion posts	-0.146	-0.099	-0.305	-0.179	-0.097

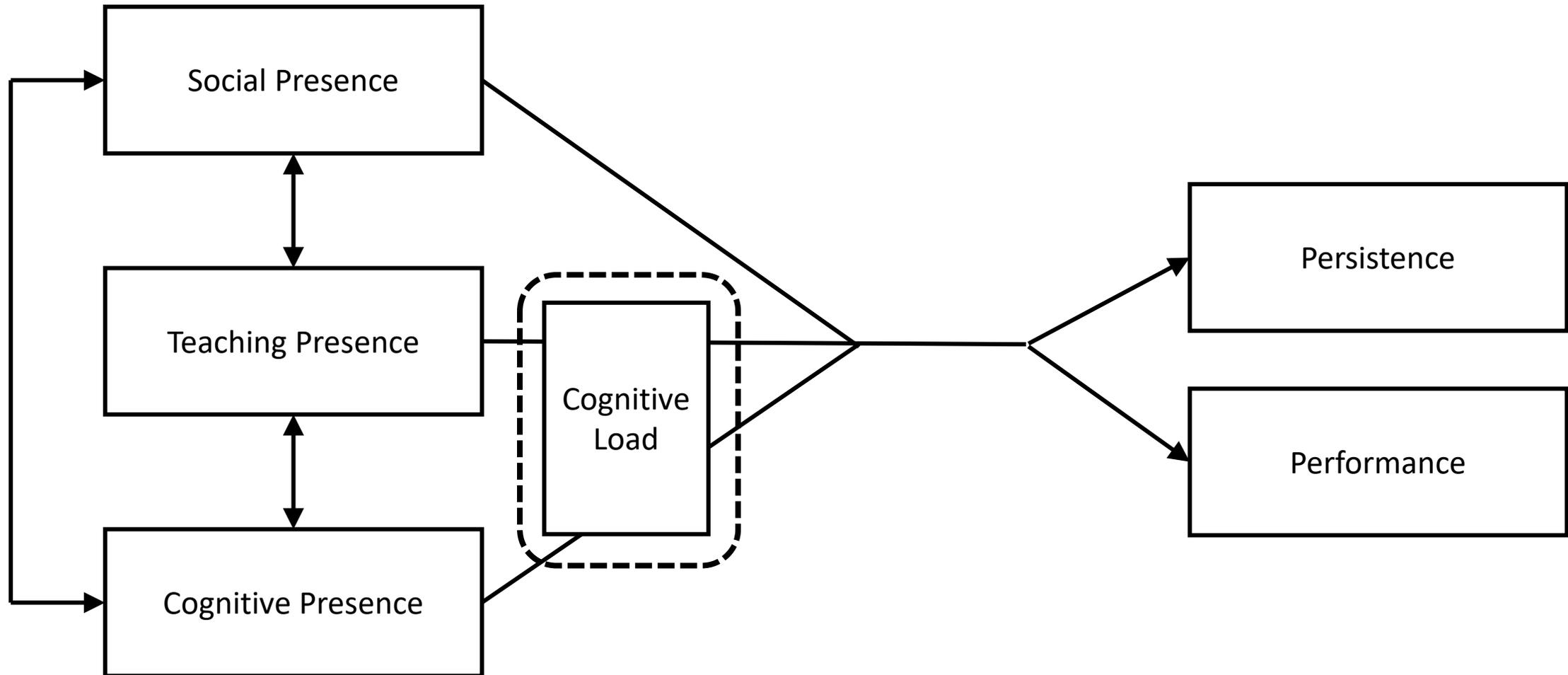
A positive average standardized rating scaled for error suggests the extraneous cognitive load is higher for this item compared to others.

There are gaps in our understanding of the influence of Col and cognitive load.

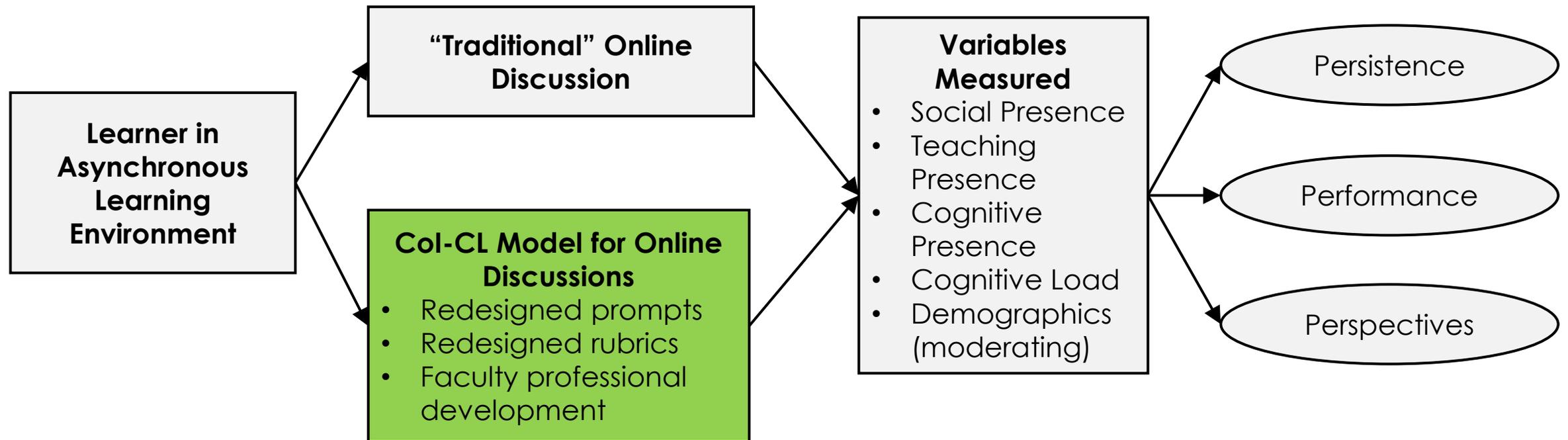
Context: asynchronous discussions in online STEM classes

	Persistence	Performance
Cognitive Load		✓
Social Presence	✓	✓
Teaching Presence		✓
Cognitive Presence		

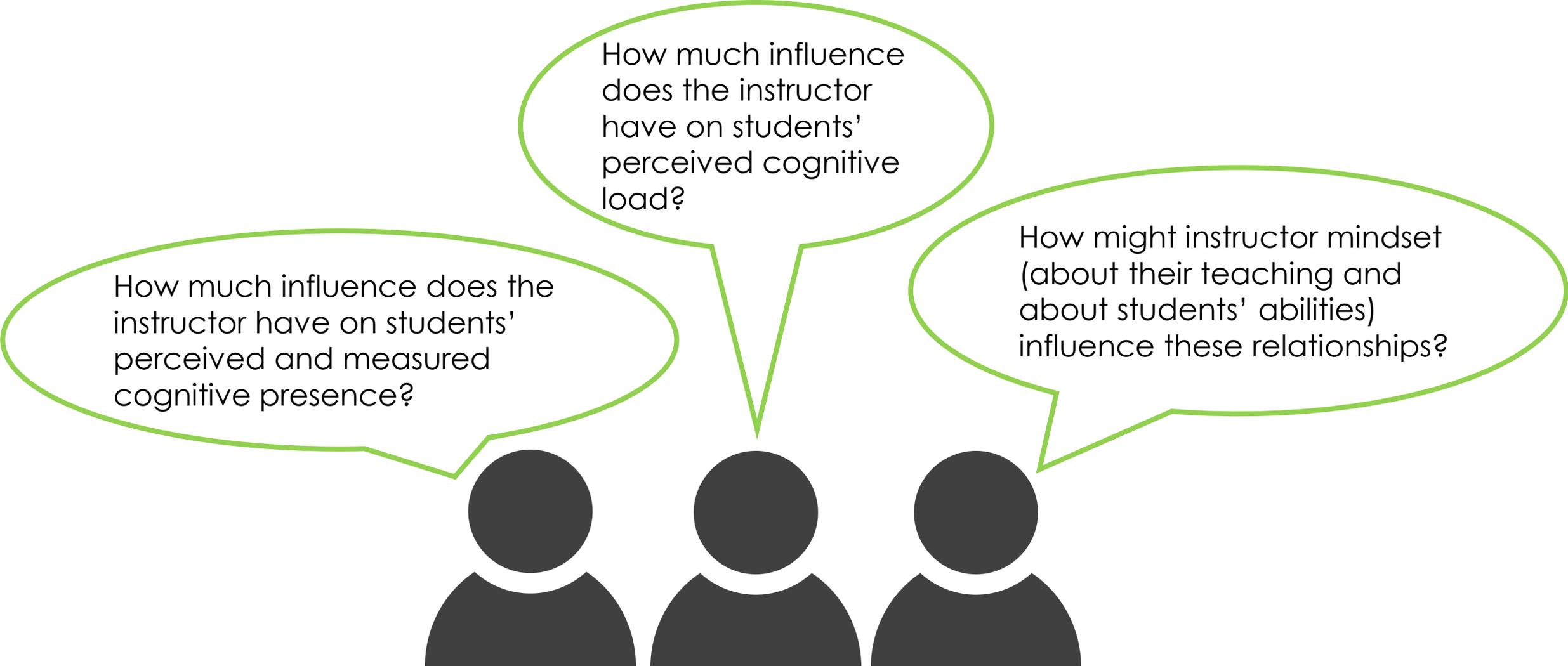
We are developing a model to explain these relationships.



Intervention: Support Community of Inquiry in asynchronous discussions while mitigating impacts to cognitive load.



But in answering questions, we are asking new ones ...



How much influence does the instructor have on students' perceived cognitive load?

How much influence does the instructor have on students' perceived and measured cognitive presence?

How might instructor mindset (about their teaching and about students' abilities) influence these relationships?

We are also exploring how community and cognitive load influence STEM attitudes and identity.

HELLO, I'M

A Scientist

HELLO, I'M

An Engineer

And we are asking bigger questions.

Prevalent cognitive
presence: Info Sharing and
Personal Narrative

High Cognitive
Load: Crafting
First Post

What role could STEM
identity play in a
student's first post?

Brainstorm: What questions could we ask next?



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Questions?

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