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Investigating Community of Inquiry and Cognitive Load

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INVESTIGATING COMMUNITY OF INQUIRY AND COGNITIVE LOAD

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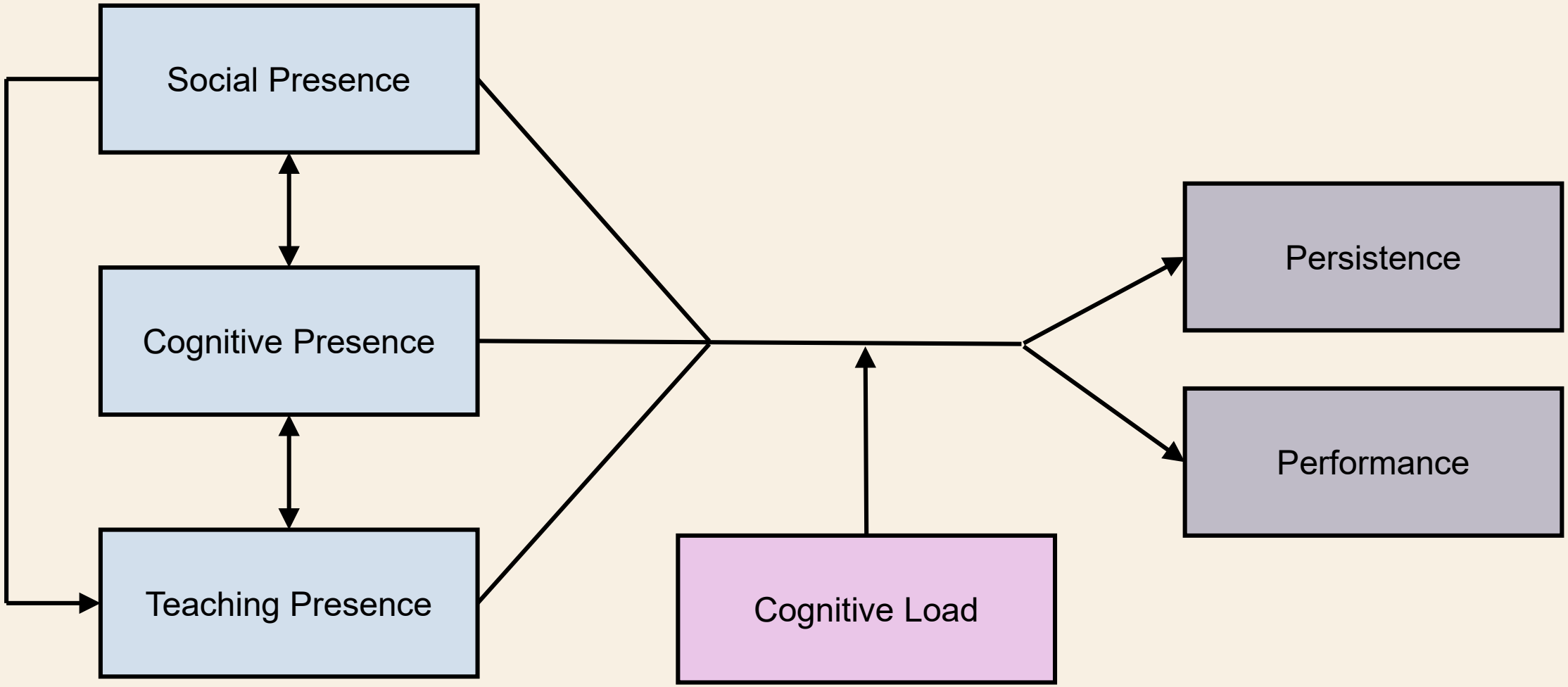
NSF PROPOSAL ABSTRACT

This project will design and research a pilot program for infusing best practices into online discussion forums in STEM courses to reduce extraneous load, improve instructional presence, instructor social presence, student social presence, and student cognitive presence.

Conceptual Framework



WHY STUDENTS WITHDRAW FROM ONLINE STEM COURSES

Emily Faulconer, Beverly Wood,
Amanda Branton & Marcus Chuasunsu

Expected publication in the next issue of
Quarterly Review of Distance Education

Brief

Literature Review on Course Attrition

Bandura, A. (2002). Social cognitive theory in cultural context. *Applied Psychology, 51*(2), 269–290. https://doi.org/10.1111/1464-0597.00092

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Literature Review on Course Attrition

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Muljana, P.S. & Luo, T. (2019) Factors contributing to student retention in online learning and recommended strategies for improvement: A systematic literature review. *Journal of Information Technology Education: Research, 18,* 19-57. https://doi.org/10.28945/4182

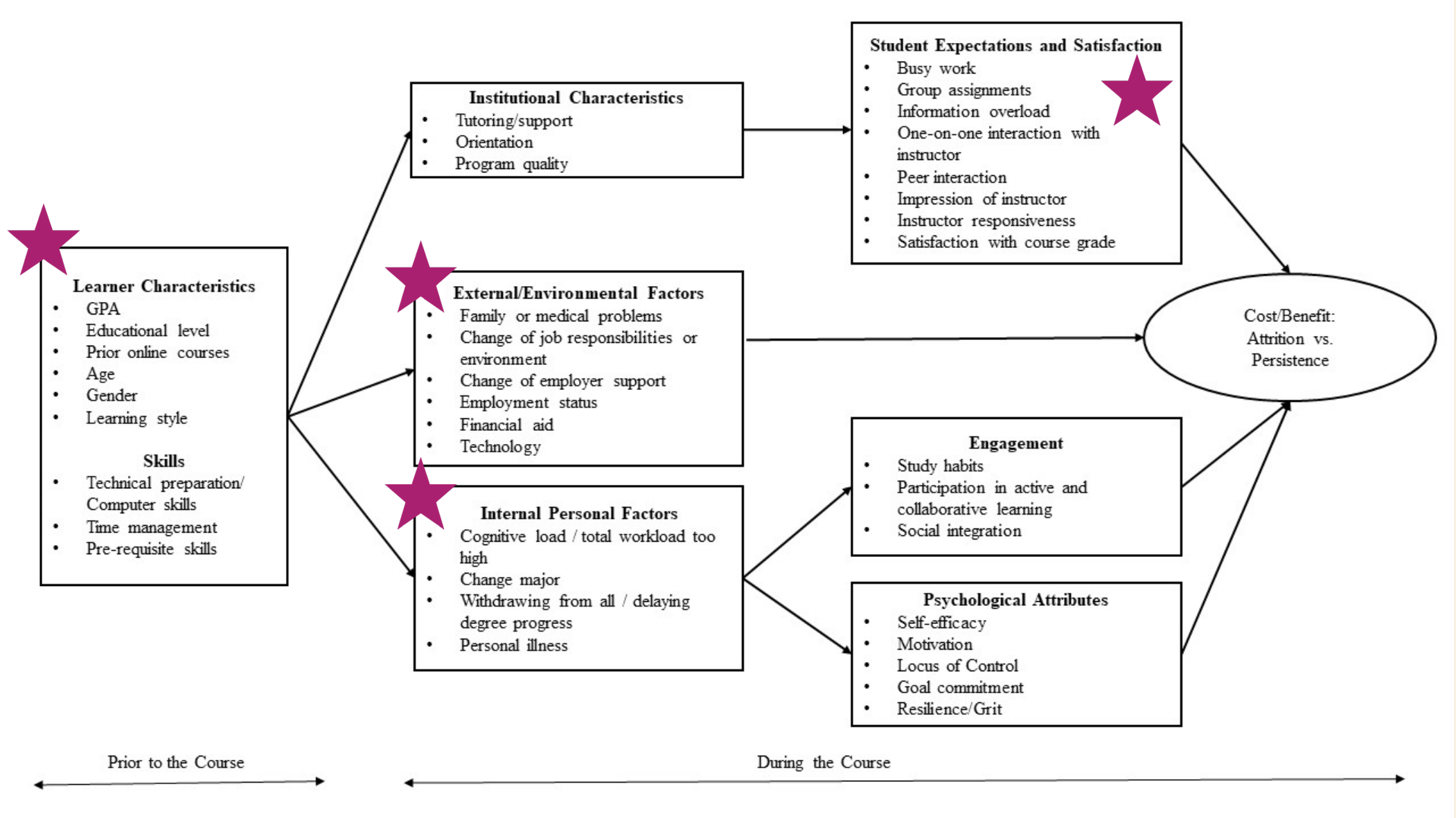


Figure 1: Conceptual framework for student online course withdrawal

DATA COLLECTION

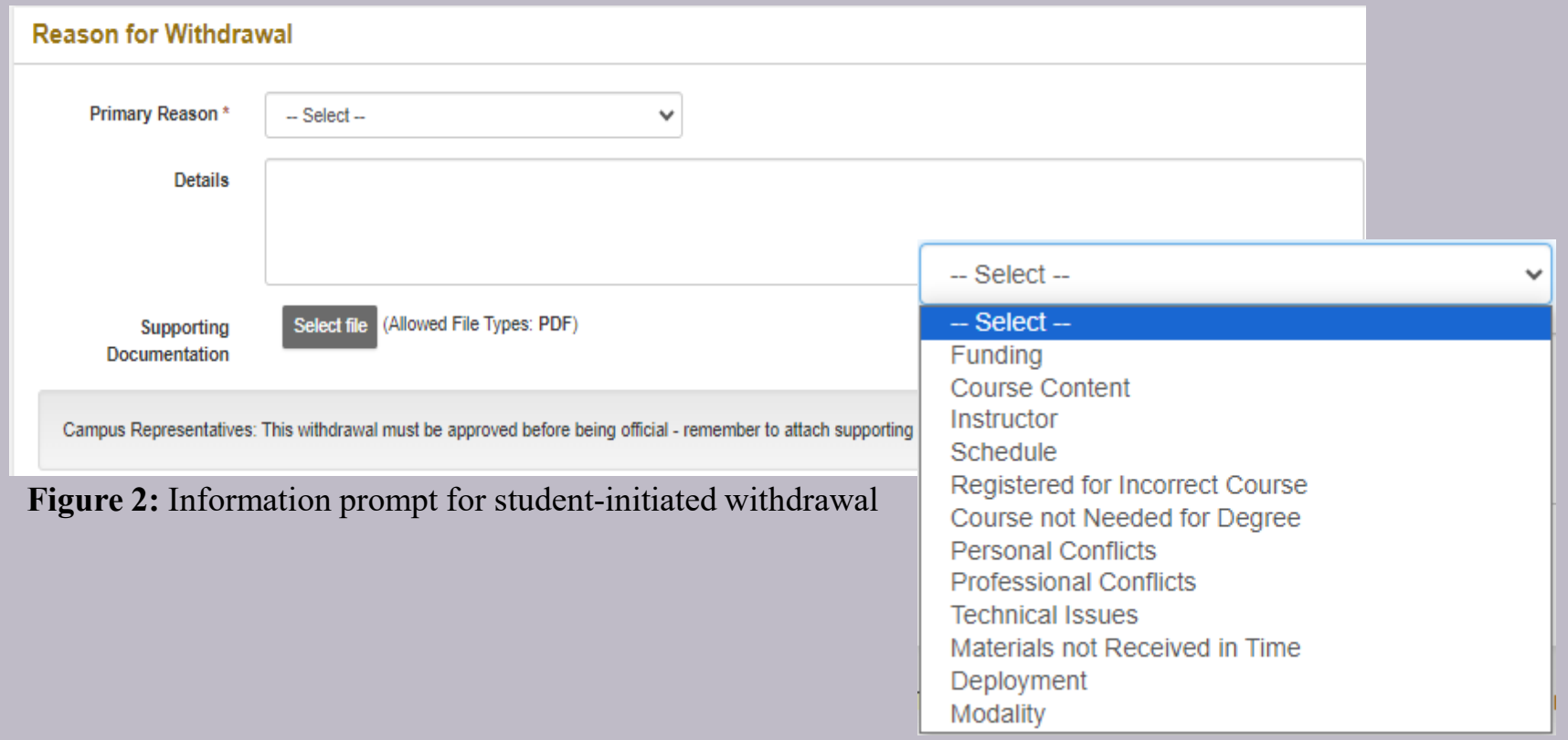


Figure 2: Information prompt for student-initiated withdrawal

METHODOLOGY

- Institutional data (IRB, #22-080) in Excel

- Data management
  - Anonymized
  - Filtered to the nine targeted course
  - Filtered by date to exclude add/drop period
  - Created separate lines for withdrawals from multiple courses

- Double-coded by researchers not involved in data management

	Course Name	Catalog Number	Enrolled at Term Start
General Education	Introduction to Computers and Applications	CSCI 109	1456
	Introduction to Computing for Data Analysis	CSCI 123	510
	Basic Algebra & Trigonometry	MATH 106	997
	Exploration in Physics	PHYS 102	1373
	Science of Flight	PHYS 123	473
Degree Support	Introduction to Engineering	ENGR 101	417
	Introduction to Computing for Engineers	ENGR 115	301
	Statics	ESCI 201	264
	Pre-calculus for Aviation	MATH 111	1572
Total			7363

Table 2:

STEM Courses Included in Study

Level 1	Code	Level 2	Code
Administrative Reasons	ADMN	Registered for incorrect course	INCOR
		Course not needed for degree	NOTND
		Materials not received in time	MATRL
External/ Environmental	EXTNL	Funding	FUND
		Deployment	DEPLY
		Personal conflicts (e.g., schedule, family obligations)	PERSC
		Professional conflicts (e.g., career change, work schedule)	PROFC
		Lack of internet access	TECH
Internal Personal	INTL	Personal illness	MDCL
		Workload - Cognitive Load	WORK
		Change major	CHANGE
		Delaying all progress	DELAY
		Engagement	ENGAGE
		Self-efficacy and motivation	MOTIV
		Goal commitment, resilience/grit	GOALS
Learner Characteristics/ Skills	LEARN	Pre-requisites and Prior Knowledge	PRIOR
		Insufficient technical or computer skills	COMPTR
		Time Management	TIME
Institutional Characteristics	ICHAR	Institutional Support	SUPPORT
		Program Quality	PROGRAM
		Negative impression of instructor	INSTR
		Lack of interaction with instructor	INTERACTION
		Lack of timely and/or constructive feedback	FEEDBK
		Topics	TOPIC
		Course Design & Assignment Types	DESIGN
		Modality Preference	MODE
		Peer Interactions	PEER
		Dissatisfaction with course grade	GRADE
Not Enough Information	NONE		

Table 1:

Coding Chart for Student Withdrawal Reasons

RESULTS

Target Course	% Withdrawals per Course
ENGR 115	9.6
ENGR 101	5.5
CSCI 123	4.1
PHYS 123	4.0
ESCI 201	3.8
PHYS 102	3.6
CSCI 109	2.6
MATH 111	2.6
MATH 106	2.0
Overall	3.41

Table 3: Withdrawal Data by Target Course

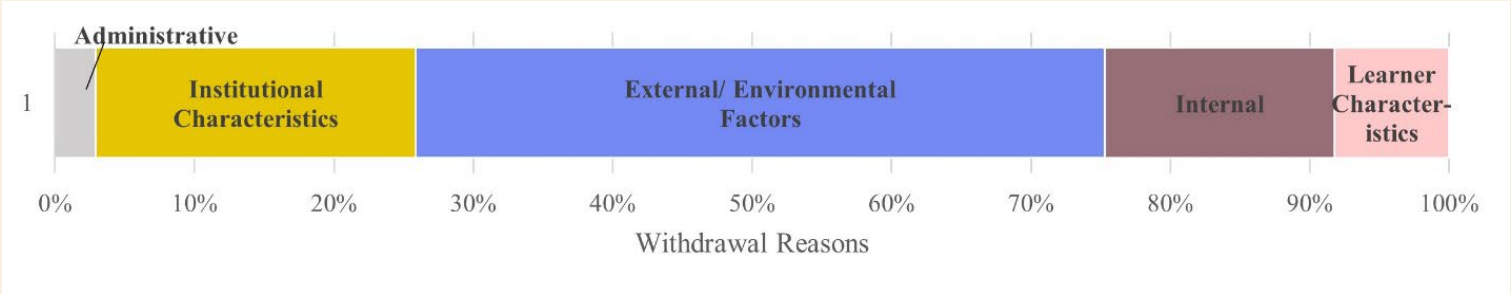


Figure 3: Withdrawal reasons from online STEM courses (Level 1)

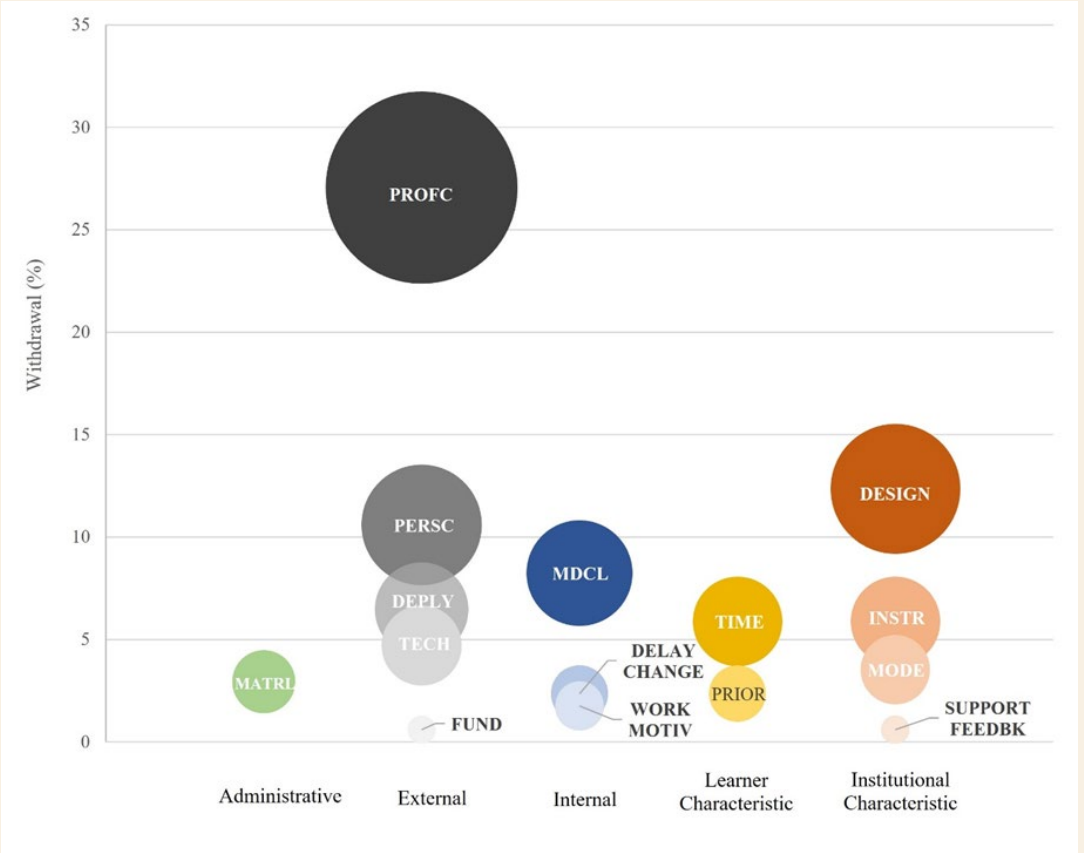


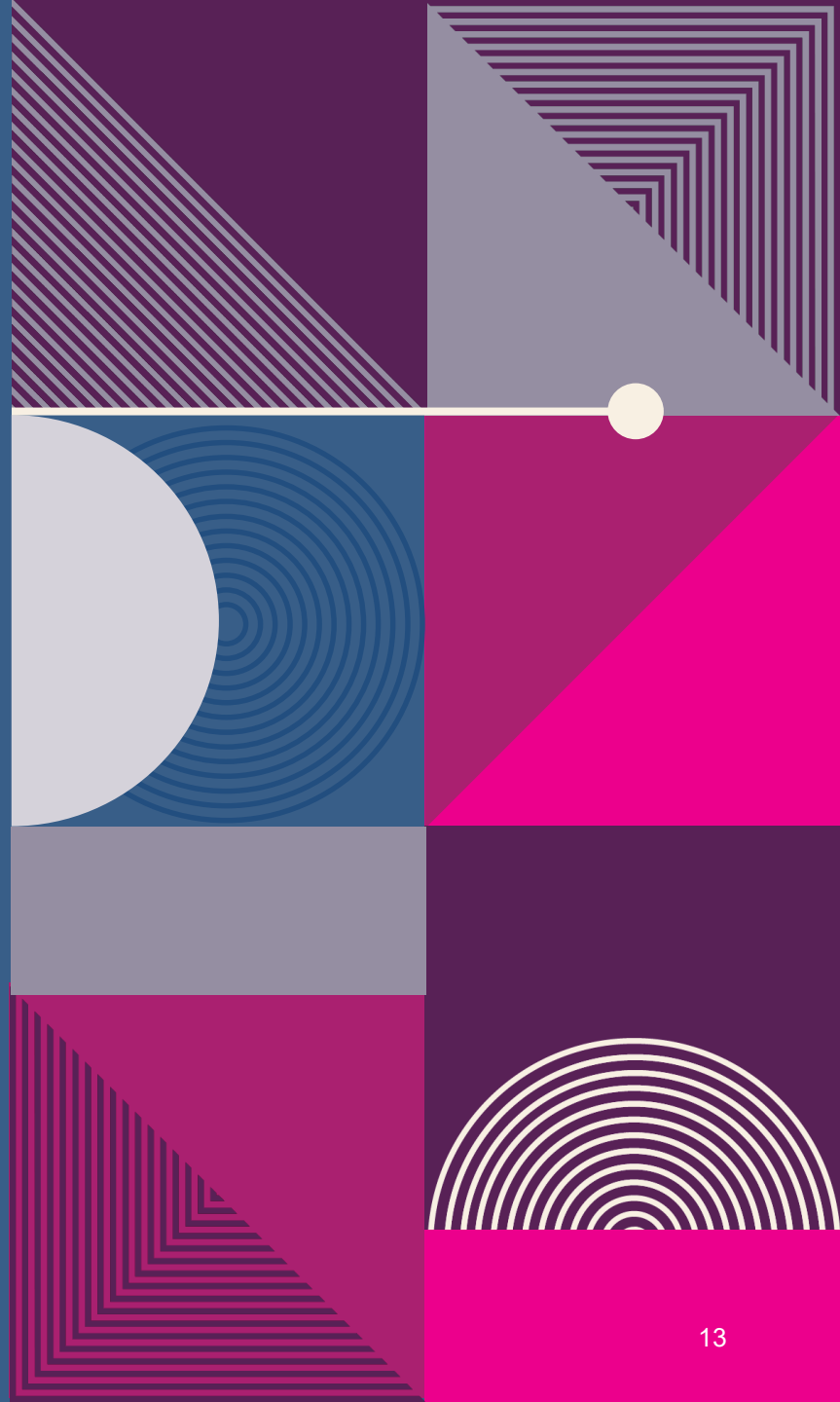
Figure 4: Withdrawal reasons from online STEM courses (Level 2)

DISCUSSION

“Gateway” courses:

- credit-bearing, lower division courses that develop key foundational knowledge for which many students are at risk of failure and thus therefore can be a barricade to further degree progress

Varying ease to address and keep students in courses.



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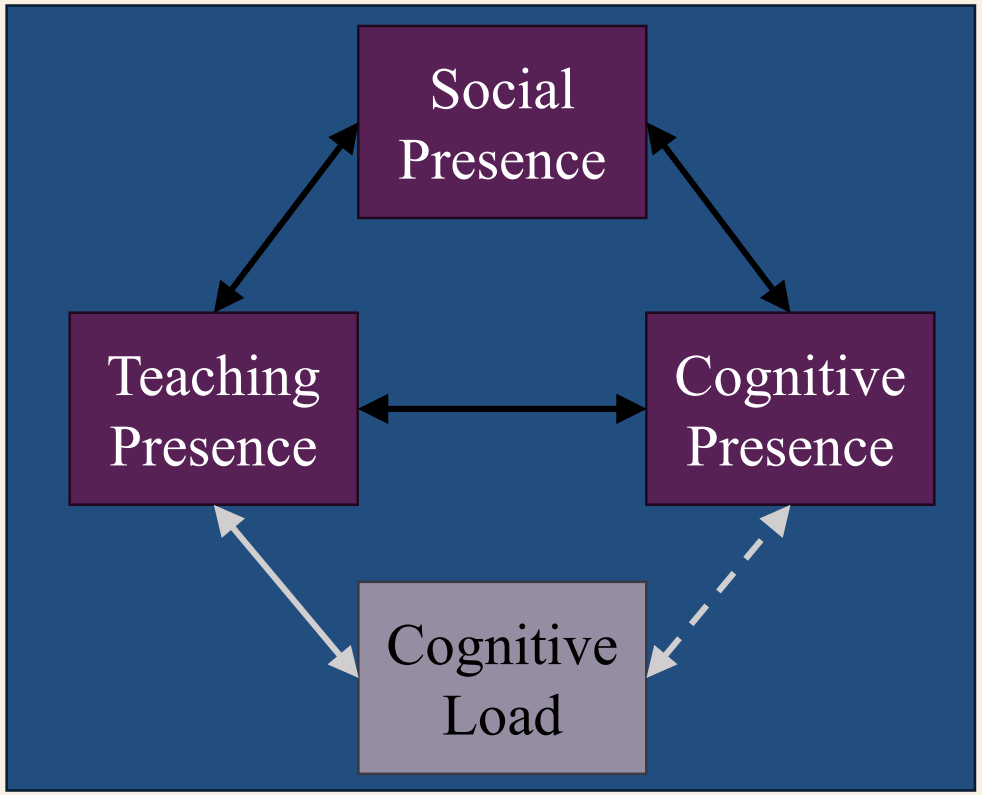

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Faulconer, E., Bolch. C., & Wood, B.L. (2022). Cognitive load in asynchronous online undergraduate STEM courses on persistence and performance. *Journal of Research in Innovative Teaching & Learning.* Doi: 10.1108/JRIT-02-2022-0010

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THANK YOU

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