

Study Habits and Beliefs of Engineering Undergraduates

Studying Mathematics in a Blended Learning Context

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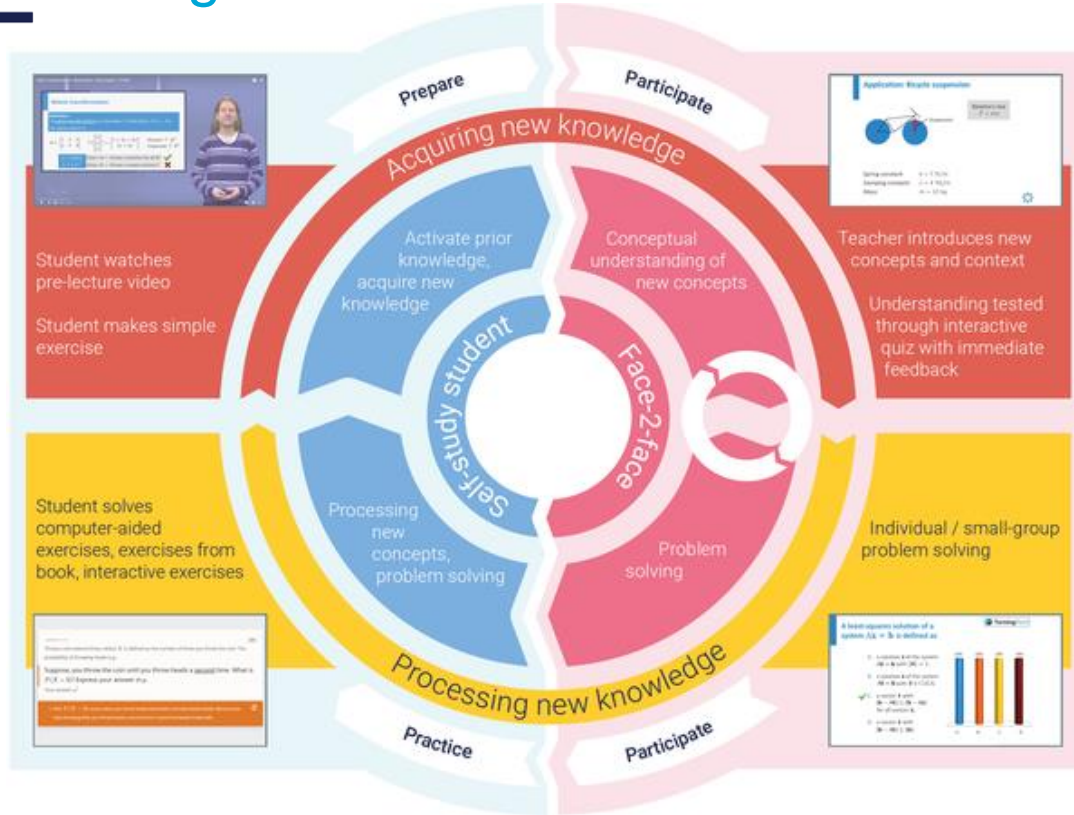
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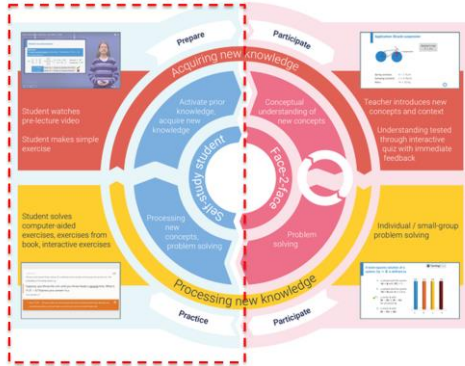
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PRIME: PRogramme of Innovation in Mathematics Education



Role of Self-Regulated Learning



Performance

Self-Control
Imagery
Self-instruction
Attention focusing
Task strategies

Self-Observation
Self-recording
Self-experimentation

Forethought

Task Analysis
Goal setting
Strategic planning

Self-Motivation Beliefs

Self-efficacy
Outcome expectations
Intrinsic interest/value
Learning goal orientation

Self-Reflection

Self-Judgment
Self-evaluation
Causal attribution

Self-Reaction
Self-satisfaction/affect
Adaptive/defensive

Research Question:

1. What are the **study habits** of engineering undergraduates in **blended mathematics courses**?

Comparing with previous studies...

		Hartwig & Dunlosky (2012)	Gellar et al. (2018)	Current Study
Sample size		324 (70% females)	931	286 (70% males)
1. How do you decide what to study next?	Whatever's due soonest/overdue			
	Whatever I haven't studied for the longest time			
	Whatever I find interesting			
	Whatever I feel I'm doing the worst in			
	I plan my study schedule ahead of time and I study whatever I've scheduled			
2. All other things being equal, what do you study more for?	Short answer exams			
	Open-ended essay exams			
	Multiple-choice exams			
	About the same for all exam types			

Comparing with previous studies: **study decisions**

		Hartwig & Dunlosky (2012)	Gellar et al. (2018)	Current Study
1. How do you decide what to study next?	Whatever's due soonest/overdue	56%	58%	41%
	Whatever I haven't studied for the longest time	2%	2%	5%
	Whatever I find interesting	5%	4%	6%
	Whatever I feel I'm doing the worst in	24%	19%	22%
	I plan my study schedule ahead of time and I study whatever I've scheduled	13%	17%	27%
2. All other things being equal, what do you study more for?	Short answer exams	20%	21%	9%
	Open-ended essay exams	-	-	31%
	Multiple-choice exams	25%	24%	1%
	About the same for all exam types	58%	55%	59%

Comparing with previous studies: **scheduling**

		Hartwig & Dunlosky (2012)	Gellar et al. (2018)	Current Study
3. What time of day do you most often do your studying?	Morning	<1%	6%	15%
	Afternoon	11%	19%	45%
	Evening	69%	53%	31%
	Late night	20%	22%	9%
4. During what time of day do you believe your studying is (or would be) most effective?	Morning	15%	21%	37%
	Afternoon	27%	33%	38%
	Evening	50%	37%	19%
	Late night	9%	8%	5%
5. Which of the following best describes your pattern of study?	I most often space out my study sessions over multiple days/weeks	47%	17%	59%
	I most often do my studying in a couple of sessions before the test (i.e., light cramming)	-	65%	38%
	I most often do my studying in one session before the test	53%	17%	3%

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Comparing with previous studies: rereading vs self-testing

		Hartwig & Dunlosky (2012)	Gellar et al. (2018)	Current Study
6. When you study, do you typically read a textbook/article/other source material more than once?	Yes, I reread whole chapters/articles	19%	15%	16%
	Yes, I reread sections that I underlined/highlighted/marked	64%	52%	43%
	Not usually	17%	33%	41%
7. If you quiz yourself while you study (either using a quiz at the end of a chapter, or a practice quiz, or flashcards, or something else), why do you do so?	I learn more that way than I would through rereading	27%	28%	28%
	To figure out how well I have learned the information I'm studying	54%	46%	43%
	I find quizzing more enjoyable than reading	10%	13%	7%
	I usually do not quiz myself	9%	13%	22%
8. Imagine that in the course of studying, you become convinced that you know the answer to a certain question (e.g. the steps to a problem). What would you do?	Read it again later	-	-	54%
	Test yourself on it again later	46%	38%	42%
	Put it aside and focus on other material	54%	62%	4%

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Research Question:

2. Are students' endorsement of study strategies related to engineering programme, gender, prior math performance, and grade goals?

Results from Chi-Square Test

	Questions	Programme	Gender	Prior Math	Min. Grade Satisfied	Grade Expect	Grade Aim
1	How do you decide what to study next?	.03	.12	.26	.01	.46	.01
2	All other things being equal, what do you study more for?	.29	.04	.77	.98	.81	.39
3	What time of day do you most often do your studying?	.01	.32	.75	.35	.23	.77
4	During what time of day do you believe your studying is (or would be) most effective?	.26	.52	.60	.70	.21	.40
5	Which of the following best describes your pattern of study?	.23	.03	.12	.36	.06	.01
6	When you study, do you typically read a textbook/article/other source material more than once?	.31	.01	.71	.51	.50	.68
7	If you quiz yourself while you study (either using a quiz at the end of a chapter, or a practice quiz, or flashcards, or something else), why do you do so?	.58	.01	.31	.65	.003	.01
8	Imagine that in the course of studying, you become convinced that you know the answer to a certain question (e.g. the steps to a problem). What would you do?	.11	.60	.92	.71	.09	.003

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Discussion

- Aligned (Q1,2,6,7): deadlines and use of self-testing as metacognitive tool
- Not aligned (Q3,4,5,8): scheduling patterns, planning
- Differences in endorsement of study strategies

Future Directions

- Are students' self-reports aligned with actual study behavior?
- How to support use of effective learning strategies?

Thank you...
.. Questions?



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