LEARNING CRITICAL THINKING SKILLS WITH ONLINE BITE-SIZED VIDEOS: CAN PRECISION TEACHING HELP?

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INTRODUCTION

Critical thinking is highlighted as a key learning goal of university education. However, it is challenging to teach this skill, which requires **explicit instruction, training, & practice**. Critical thinking education is also challenged by the **limited contact time** as well as **barriers to engagement** in online classrooms.

AIM: The current study evaluated the effectiveness of a technology-enhanced intervention for critical thinking, focusing on the identification of logical fallacies.

VIDEO-BASED LEARNING

- Bite-sized videos: Minimise cognitive load & improve students engagement

PRECISION TEACHING

- Frequency-building practice: Timed repetition of tasks coupled with performance feedback provided immediately after timed trials

PROBLEM-BASED LEARNING

- Context-based learning: Embedding critical thinking training into context-focused courses

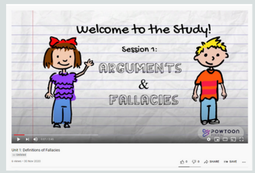
METHODOLOGY

A total of 57 participants:-

- Group A: PRECISION TEACHING Intervention group
- Group B: PRECISION TEACHING + PROBLEM-BASED TRAINING Intervention group
- Group C: SELF-DIRECTED LEARNING Control group

Two learning episodes on common logical fallacies:

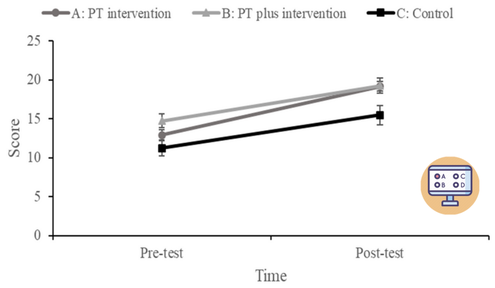
- A pre- & post-episode assessment
- A 3-minute learning video
- A practice phase specific to each group



RESULTS/FINDINGS

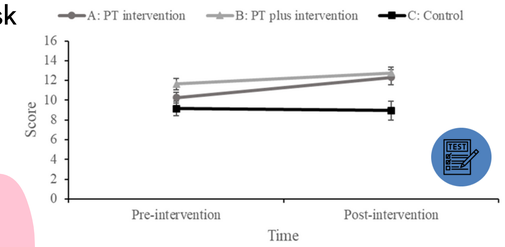
Multiple-choice fallacy identification questionnaire (25 items):

- Improvements at post-intervention, regardless of groups
- Lower-scoring participants had higher gains than high-scoring participants



Informal Reasoning Fallacy Identification Task (IRFIT):

- Intervention groups (A & B) showed higher improvements than the control group



Feedback from Students:

""Interesting"
"Educational"
"Informative"

"It was a good learning thing...although you are learning something, it becomes more interactive, when you watch a video and then do some tests related to the videos"

"I don't think it would be any less helpful than a teacher in-person teaching these constructs"

"I haven't really thought about logical fallacies too much. And it was quite interesting to just learn something new and then apply it."

CONCLUSION

- Bite-sized video-based approaches can be used to improve critical-thinking skills.
- Precision Teaching, on its own or combined with problem-based training, can improve the ability to generalise learning to novel contexts.
- To our knowledge, no research has integrated video learning technologies with Precision Teaching to enhance critical-thinking skills in university students.
- Our findings have clear implications for critical thinking instruction in HE and, more broadly, for the development of online learning interventions.

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