Trinity College Dublin
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LAIDLAW SCHOLARS

Don't Just Tell Me I'm Right:

A User Study of Self-Explanation Prompting in AI-Assisted Learning

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Introduction

Generative AI is built to prioritize delivering answers over encouraging active learning. learners who rely on AI to bypass the effort of thinking risk losing the critical thinking that effort builds. Self-explanation, asking learners to put their own reasoning into words, is one of the most reliable ways to counter this, yet current AI tutors rarely ask for it.

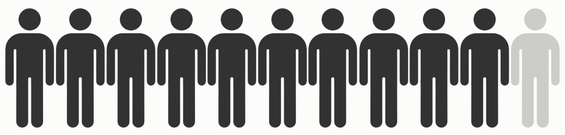
Aims

- **Build an AI tutor** that prompts self-explanation two ways: writing freely, or choosing from a menu of options
- Compare **how each format is experienced** by a small sample of students
- Find out what would **make learners want to engage** in self-explaination during AI-assited learning

Methodology

Problem diagnosis

A survey of **26** Laidlaw Scholars found strong demand but little supply. **24** respondents report self-explanation to be a useful learning technique, yet only **10** respondents report AI ever prompting them to self-explain while learning.



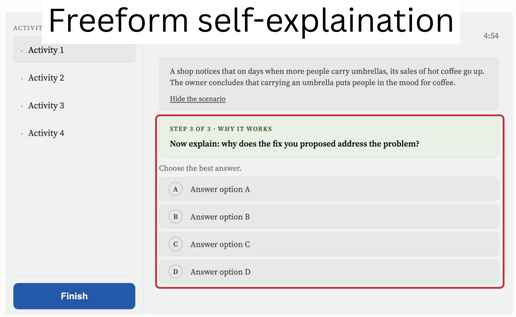
92% find self-explaination useful for their learning

Only 38% have ever been asked to do it by an AI tutor

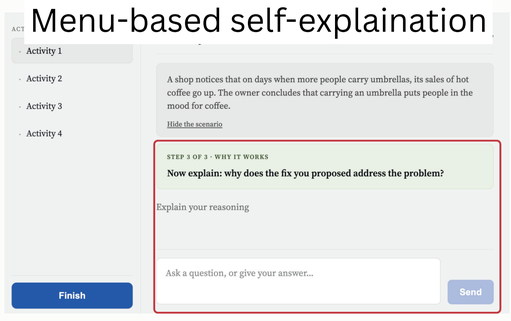
Software Development

Built **SET AI: an AI tutoring web app** which helps learners work a **lesson on research biases**. Given a flawed research design, learners are asked to spot the flaw, and fix it with an AI tutor's help. Once they have arrived at an answer **learners are asked to their reasoning** rather than moving on immediately.

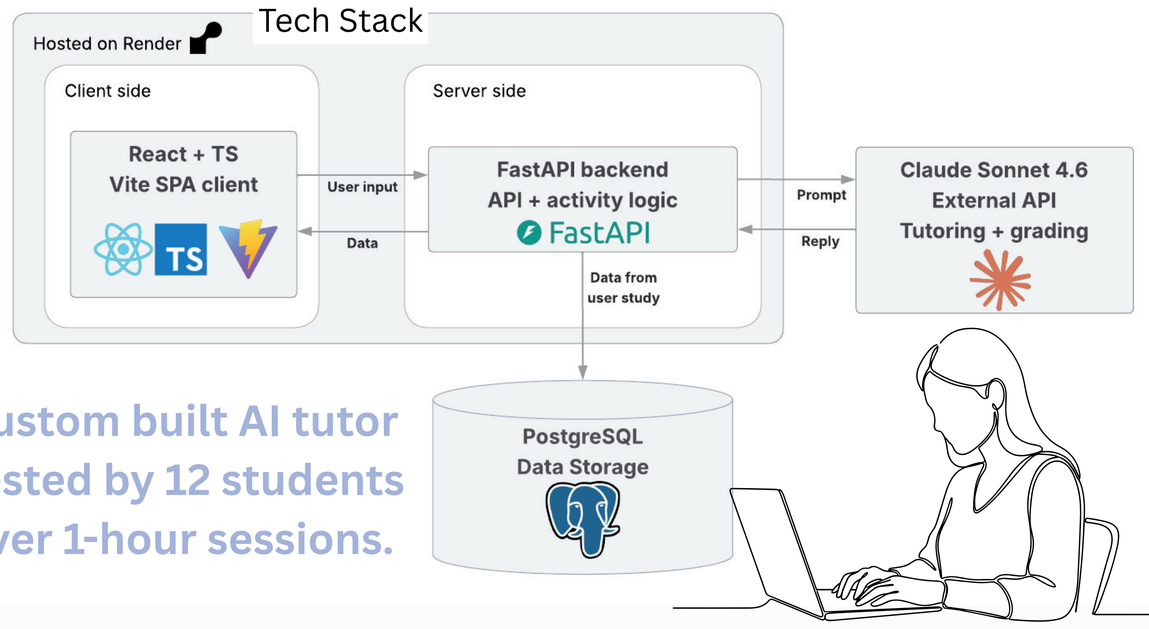
Freeform self-explaination



Menu-based self-explaination



Tech Stack

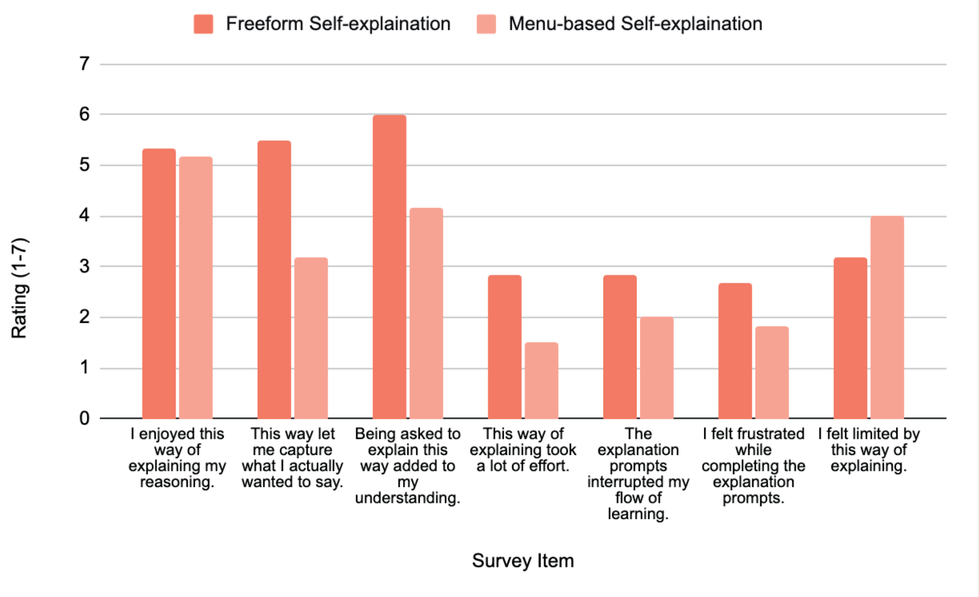


User Study

12 current and past Laidlaw Scholars from varied academic backgrounds each completed two lesson using SET AI, with the **two self-explaination formats** respectively. After which a **survey** and a short **interview** were conducted on how the two formats felt to use.

Custom built AI tutor tested by 12 students over 1-hour sessions.

Survey Results



What Learners Said

On The Act of Self-Explanation:

"Just being told you're right feels like 'I can do no wrong', explaining produces more critical understanding"

"You can think you understand something, but explaining it stress-tests your understanding."
"Helped reinforce the answer, and stopped me from immediately moving on to the next thing."
"Had to justify why it was obvious, like I was explaining to someone else."

On Freeform Format

"In my own words, not put in my mouth"
"More effort in the moment, but retains for longer"
"better capture my understanding"
"Siloed into my own way of thinking"

On Menu-based Format

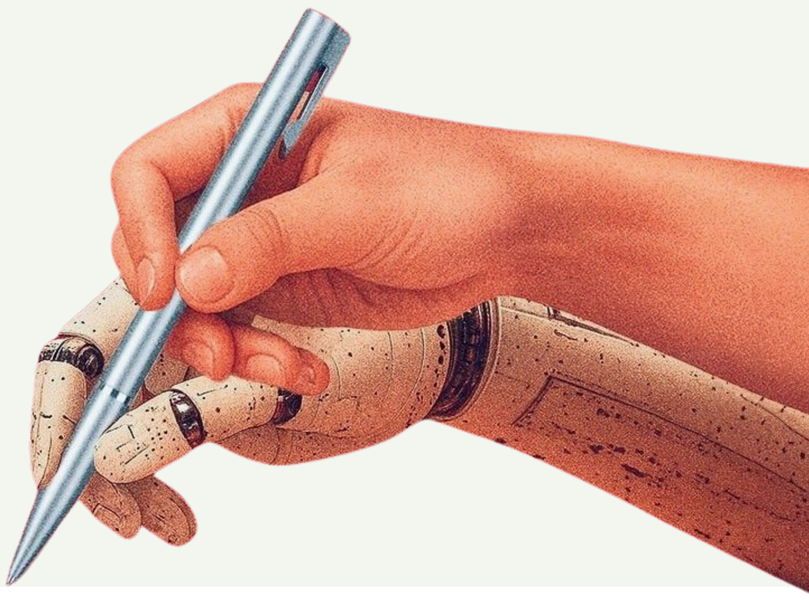
"Gave you clearly defined ways to think"
"Felt good that it gave you correct options"
"Just picking the option that looks right"
"Felt boxed into someone else's options"

Conclusion

Being asked to explain their reasoning shifted learners from passively accepting an answer to actively interrogating it.

Freeform self-explaination demands more effort but yields explanations closer to what learners actually think. Menu-based lowers the barrier at the price of depth.

Next Steps: This study measured how self-explanation felt, not whether it produced measurably better learning. That link, and whether it holds at scale, is the natural next test.



Full Report

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