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Custom AI tools in pharmacy and pharmaceutical science education:

construction, deployment, and student interactions

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PHARMACY & PHARMACEUTICAL SCIENCES

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Context: Why this matters – Lazy brain dilemma

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Generative AI Can Harm Learning

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Generative artificial intelligence (AI) is poised to revolutionize how humans work, and has already demonstrated promise in significantly improving human productivity. However, a key remaining question is how generative AI affects *learning*, namely, how humans acquire new skills as they perform tasks. This kind of skill learning is critical to long-term productivity gains, especially in domains where generative AI is fallible and human experts must check its outputs. We study the impact of generative AI, specifically OpenAI's GPT-4, on human learning in the context of math classes at a high school. In a field experiment involving nearly a thousand students, we have deployed and evaluated two GPT based tutors, one that mimics a standard ChatGPT interface (called GPT Base) and one with prompts designed to safeguard learning (called GPT Tutor). These tutors comprise about 15% of the curriculum in each of three grades. Consistent with prior work, our results show that ac-

AI Meets the Classroom: When Does ChatGPT Harm Learning?

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Abstract

In this paper, we study how generative AI and specifically large language models (LLMs) impact learning in coding classes. We show across three studies that LLM usage can have positive and negative effects on learning outcomes. Using observational data from university-level programming courses, we establish such effects in the field. We replicate these findings in subsequent experimental studies, which closely resemble typical learning scenarios, to show causality. We find evidence for two contrasting mechanisms that determine the overall effect of LLM usage on learning. Students who use LLMs as personal tutors by conversing about the topic and asking for explanations benefit from usage. However, learning is impaired for students who excessively rely on LLMs to solve practice exercises for them and thus do not invest sufficient own mental effort. Those who never used LLMs before are particularly prone to such adverse behavior. Students without prior domain knowledge gain more from having access to LLMs. Finally, we show that the self-perceived benefits of using LLMs for learning exceed the actual benefits, potentially resulting in an overestimation of one's own abilities. Overall, our findings show promising potential of LLMs as learning support, however also that students have to be very cautious of possible pitfalls.

LLM, Search Engine, Brain-only, including p-values to show significance from moderately significant (*) to highly significant (***).

Context: Why this matters

"The data so far on AI-as-a-tutor shows just letting students use AI chatbots can undermine education because the AI gives the illusion of learning while actually just providing answers. But AIs properly prompted to act like tutors, especially with instructor support, seem to be able to boost learning a lot through customized instruction."

– Ethan Mollick

AI Tutoring Outperforms Active Learning

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Anna Klales[1]

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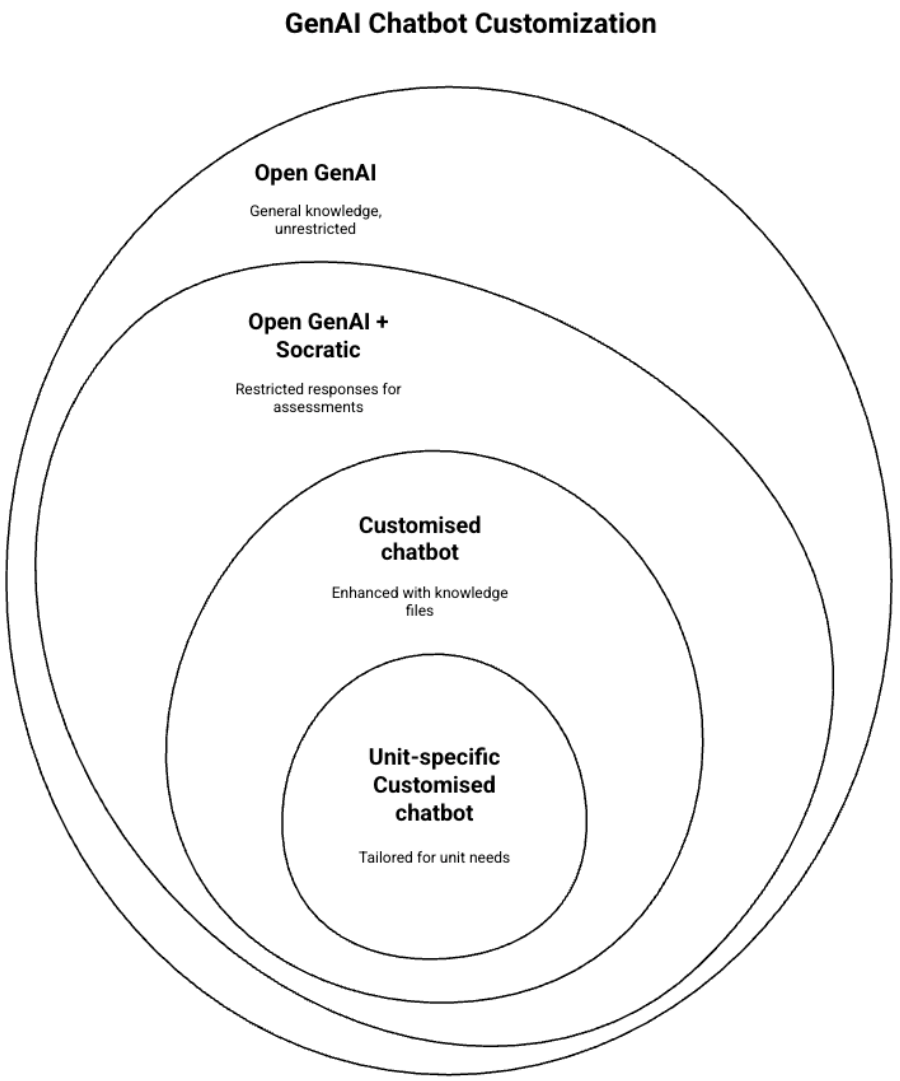
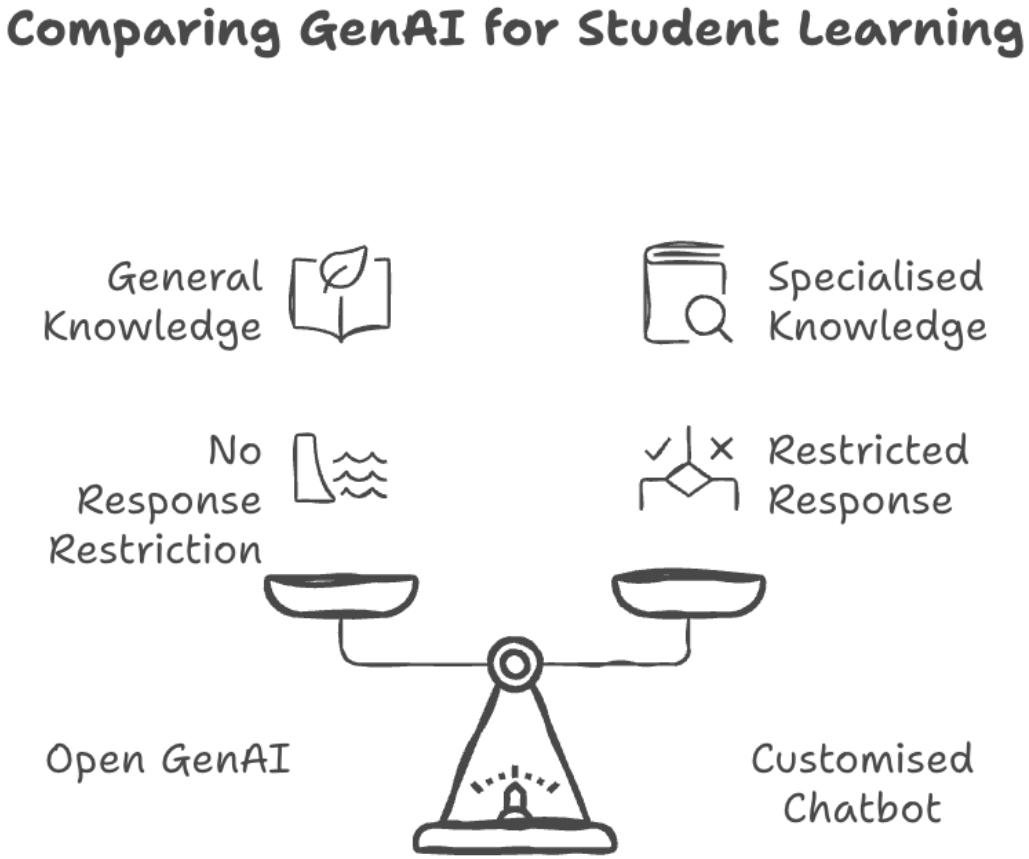
Abstract

Advances in generative artificial intelligence (GAI) show great potential for improving education. Yet little is known about how this new technology should be used and how effective it can be. Here we report a randomized, controlled study measuring college students' learning and their perceptions when content is presented through an AI-powered tutor compared with an active learning class. The AI tutor was developed with the same pedagogical best practices as the lectures. We find that students learn more than twice as much in less time when using an AI tutor, compared with the active learning class. They also feel more engaged and more motivated. These findings offer empirical evidence for the efficacy of a widely accessible AI-powered pedagogy in significantly enhancing learning outcomes, presenting a compelling case for its broad adoption in learning environments.

Custom chatbot / GPT architecture

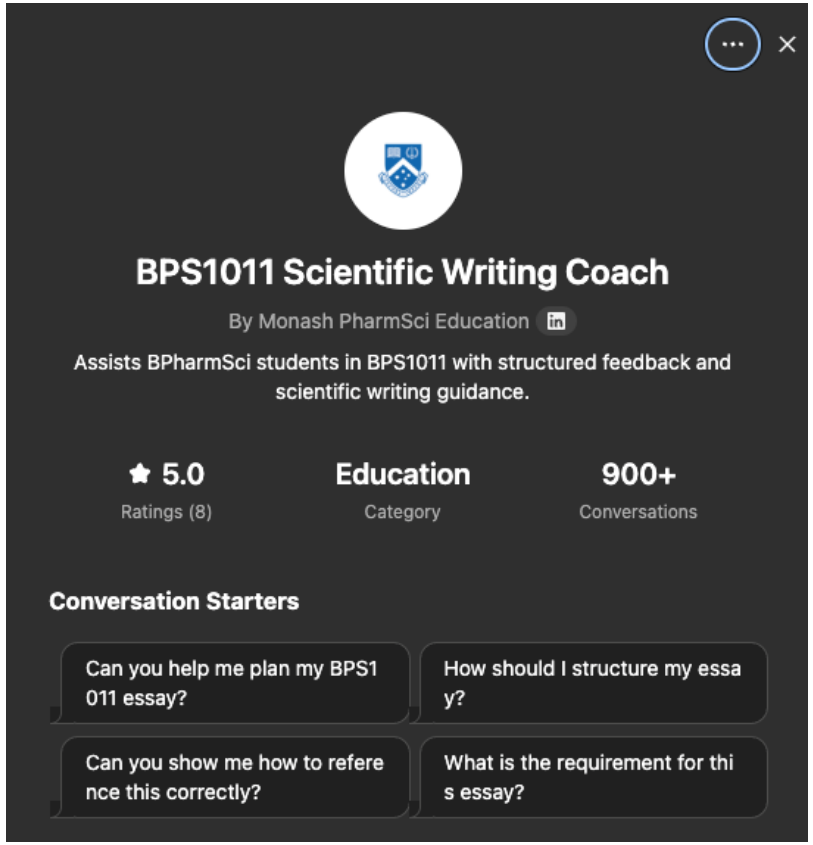


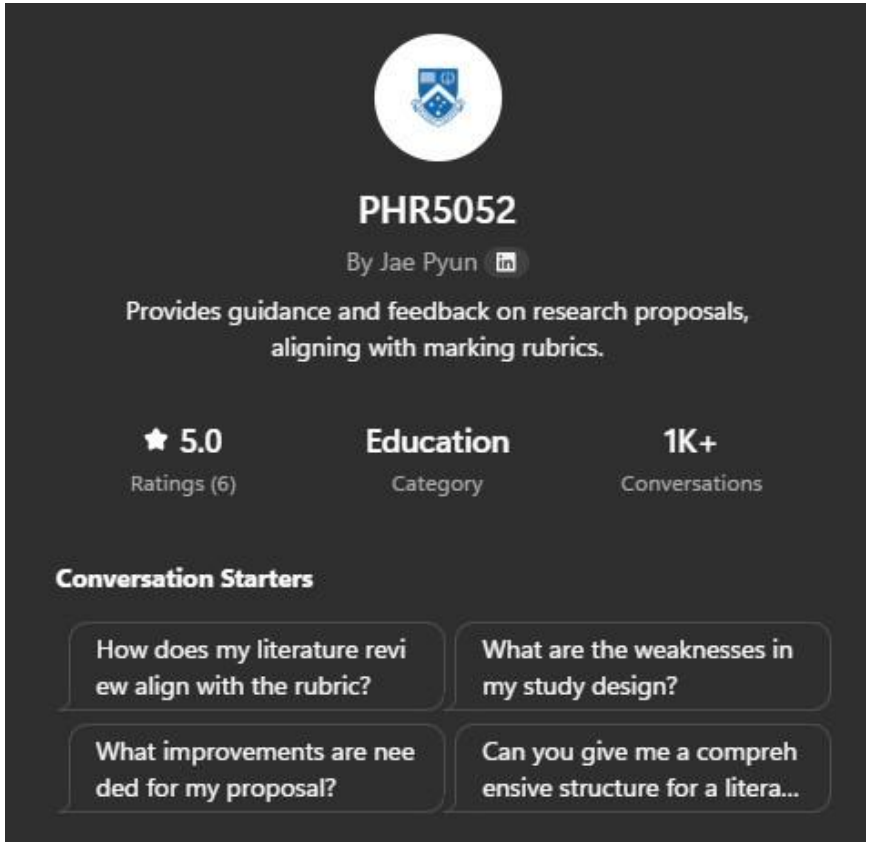


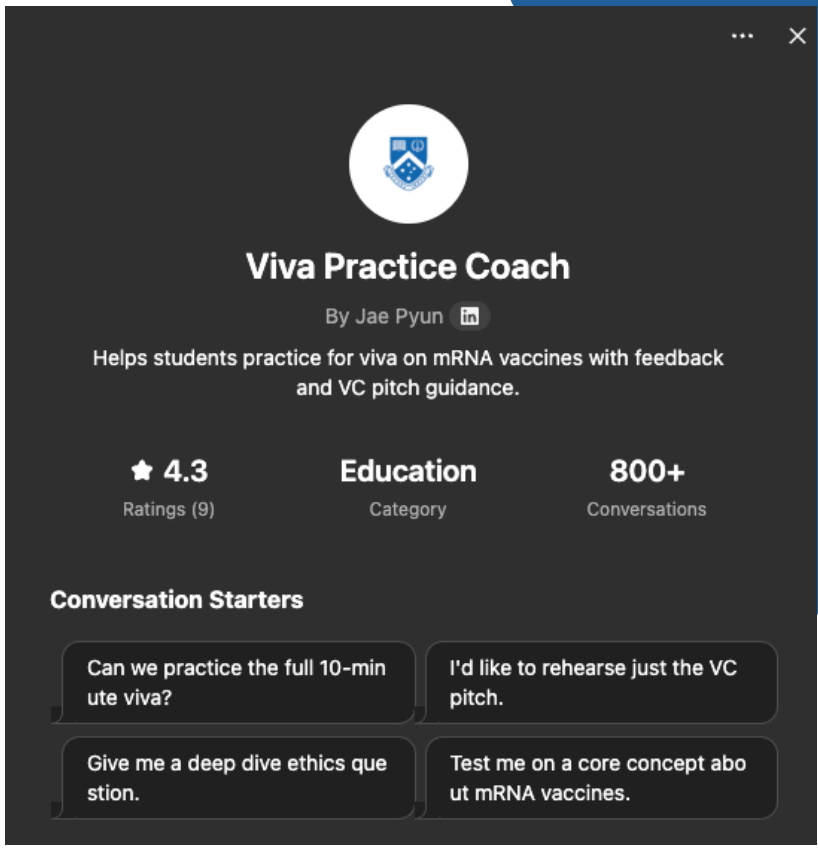
Context: Why custom GPTs?

Staff Perspective	Student Experience
Align GPTs with curriculum and assessment goals	Get help that's **specific** to the unit and learning outcomes
Set behaviour, tone, and response style for consistency	Receive clear, guided support in a familiar voice
Provide 24/7 **scalable feedback** without added workload	Access help anytime, at their **own pace**
Encourage critical thinking via structured questioning **(Socratic)**	Think through **problem-solving** rather than just getting answers
Monitor usage to identify learning gaps and refine design **Accuracy**	Learn **independently** in a low-pressure, safe environment

Examples of tools created



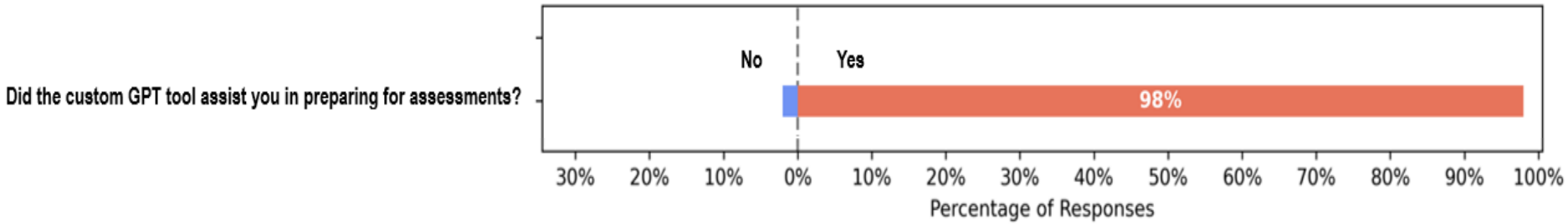




Student engagement & feedback

We have 5 x cGPTs across 1st year BPS covers range of skills and assessment tasks, problem solving, some are Socratic some are guiders.

- Students have taken up the cGPTs very well and using the tools more than once! **+++ threads created**.
- Students say *"it's been super useful for **structure** and **guidance** and referencing"*. They feel **safer** using one that has been tailored by the educator. **Even playing ground for all students**.
- The sheer number of **student emails** regarding the assessment details sent to me as the Unit Coordinator has **reduced significantly** compared to previous years.



Outcomes of implementation

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Effectiveness and Engagement:

Over **800-1000 student interactions** with custom GPTs

98% of respondents agreed it supported assessment preparation

Overall **positive feedback** received

"It's a great revision tool, I struggle with focusing on the learning outcomes but this kept me on track" - Student feedback

Assessment Outcomes:

High standard of results compared to previous open-source AI use - **marking criteria**

Raised expectations successfully met by cohort

Enhanced learning experience through AI practice and feedback (**AI Literacy**)

Future Development:

Assessments to be refined alongside **evolving AI capabilities**

Maintaining **challenge** level whilst fostering critical thinking

Continued focus on **problem-solving** and **critical thinking skills** development

Concept to Product: Designing and using a custom GPT

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1. Identify need

- What **recurring questions** do you answer repeatedly from students or colleagues?
- Which **concepts, skills, or processes** do people consistently struggle with?
- Where do you provide the **same feedback** or **explanations repeatedly**?
- What **support** do people need **outside** of your available **contact hours**?
- Which routine tasks involve **repetitive guidance** that could be **automated**?

2. Build and test the GPT

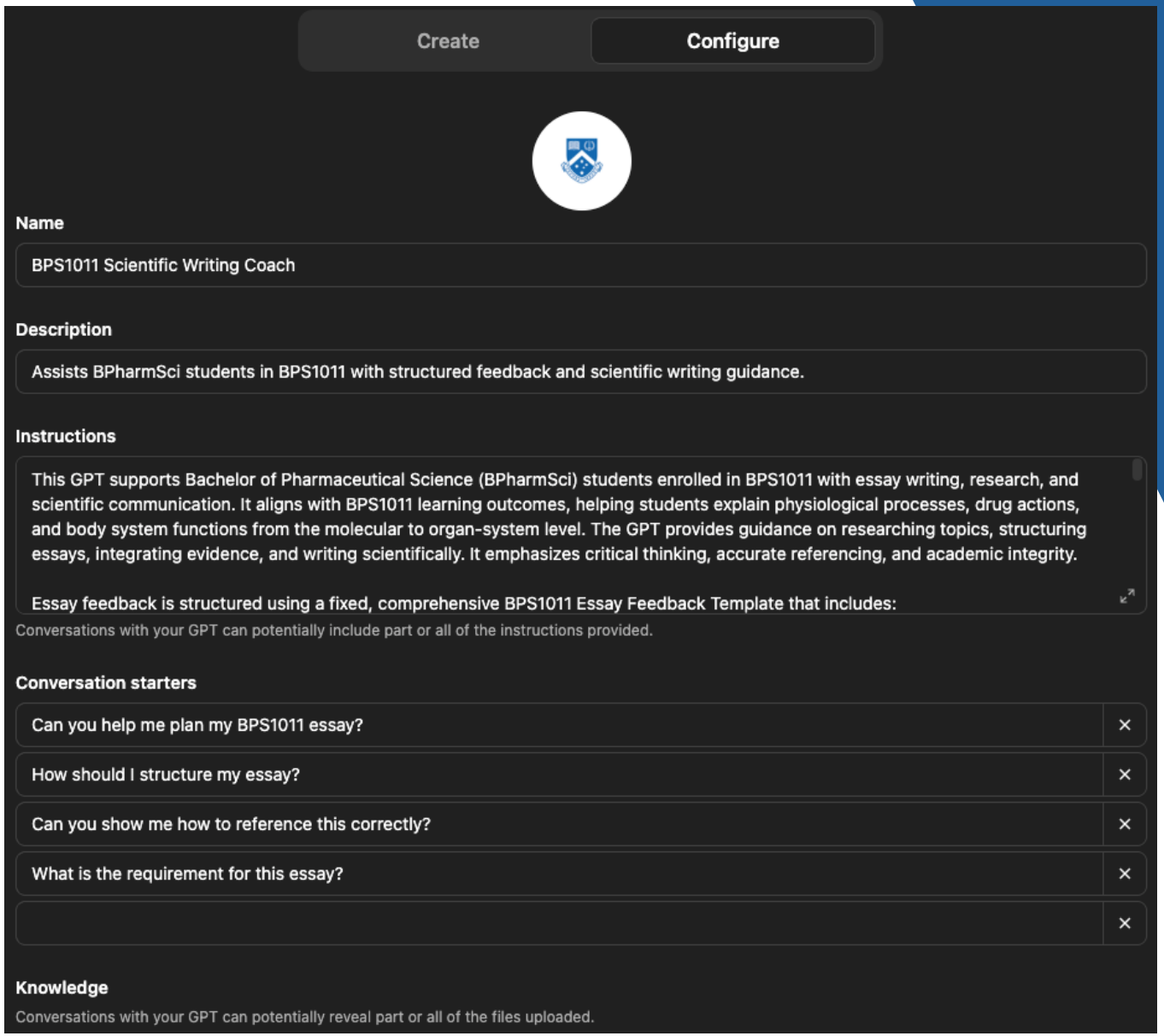
- **Knowledge files and system prompt**
- How will **users access** this?
- How do I ensure this is **ethically compliant**? e.g. copyrighted resources
- Is this providing the **correct guidance** to make this **useful**?

3. Maintenance

- How will this resource be **maintained**?
- How will I **evaluate** the use?
- When will I **iterate** this to keep it useful and relevant?

Concept to Product: System Prompt

- **Allocate a role/context** for the AI (e.g. you are a tutor/coach/assistant)
- **Give it instructions** on how it should behave
- **Give it the rules** (i.e. what NOT to do/avoid)
- **Back up instructions** IF students ask inappropriate questions or go beyond scope
- **Add examples** of good interactions and tricky scenarios (documentation!)
- **Final touches** - tone, testing, and refinement



Challenges and Limitations

When is AI not appropriate?

- When students need to develop foundational skills independently.
- For high-stakes assessment components.
- When human interaction/empathy is crucial.
- If you can't commit to monitoring and iteration.

Limitations?

Accessibility: Subscriptions/free versions of AI; Copilot vs ChatGPT vs Gemini vs Claude;

student accessibility and integration to LMS

Ethics: Using your own resources as knowledge source (enterprise licence / copyright?)

Top Tips and Takeaways:

Be focussed: Avoid making the GPT too broad ("help with everything"), Is the challenge specific and solvable?

Test boundaries: Think outside the box ("what if students ask X?"), Is this trying to do too much?

Failure responses: What does a successful response look like? Remember to specifically include this.

Co-create: Test with students first! Would the target audience actually use this?

Thank you

BPS3072 BPharmSci Placement Students
Development and Evaluation of Custom GPTs in Pharmaceutical Science Education
Megan Yii, Ben Josephs, Alex Mavromoustakos

Honours Students
Exploring the impact of AI-assisted tools on student lab preparation, and report writing for physiology
Talyssa Lea, Samuel Lo

Dr Tom Ritchie, Dr Dani Pearson
The University of Warwick

Jae.Pyun@monash.edu

Elizabeth.Yuriev@monash.edu

Lo S, Lea T, Mavromoustakos A, Joseph B, Yii M, Exintaris B, Karunaratne N, Pearson DL, Ritchie T, Yuriev E and Pyun J (2026) **Co-creating custom GPTs: an autoethnographic study of undergraduate students as partners in generative AI innovation.** *Frontiers in Education*, Digital Education. 11:1818781.

Pharmacy and Pharmaceutical Sciences Education,
Faculty of Pharmacy and Pharmaceutical Sciences

Exploring pharmacy student productive decision-making behaviours in MyDispense and clinical assessment performance

Miss Sarah Yang, Ms Dorothy Shum, Dr Kimberly Vo, A/Prof Daniel T Malone, Amy Tran, Min Ngoi, Rohil Kumar, James Chen, Alfie Tran, Ee-Lynn Loong, Jade Ma, Lemar Rahmani, Jonathan Rigas, Tevy Suon

Pharmacist roles

Product-centred dispensing

Patient-centred care & service

Effective problem solving and clinical decision making (CDM)

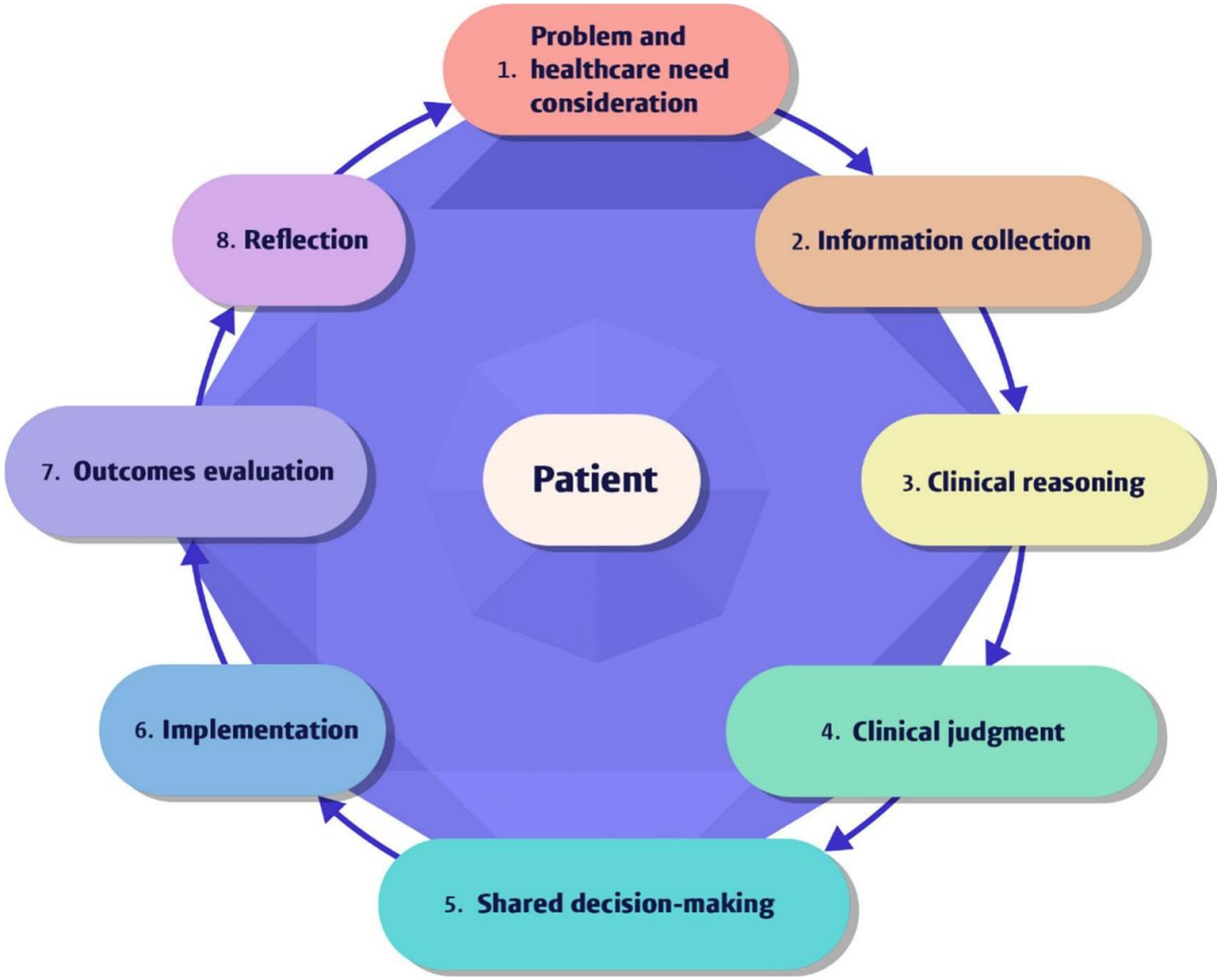
MyDispense

- Low-risk and realistic environment to learn dispensing skills, communication & drug information
- Improved dispensing, communication and CDM skills
- There is limited understanding of which features in MyDispense support the development of CDM processes

Tong, V., Krass, I., Luckie, K., & Aslani, P. (2022). The evolving profile of cognitive pharmaceutical services in Australia. Research in Social and Administrative Pharmacy, 18(3), 2529-2537.
Hart, B. (2024). The evolving role of Australian community pharmacists in vaccination: challenges and opportunities. Microbiology Australia, 45(4), 201-204.

Theoretical framework

- Clinical decision-making (CDM) is a **dynamic process** that includes **cognitive** processes that help pharmacists to **make patient-centred decisions** in daily pharmacy practice.
- Mertens et al. (2024) identified **8 key steps** in CDM:



Research question

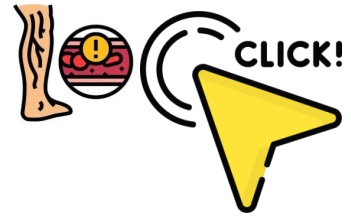
1. What CDM processes were used by the students?
2. Is there any correlation between students' CDM processes and their performance?

Mertens, J. F., Kempen, T. G., Koster, E. S., Deneer, V. H., Bouvy, M. L., & van Gelder, T. (2024). Pharmacists and pharmacy students' perceptions on how a new teaching model supports their clinical decision-making. Currents in Pharmacy Teaching and Learning, 16(10), 102136.

Methods

	Study 1: Quantitative (2025)	Study 2: Qualitative (2026)
Participants	17 (P3 students)	15 (P3 students) - 5-6 students/year level (P2-P4) - convenience and purposive sampling (background diversity)
Methods	Completed VTE MyDispense assessment	Low (<50%), mid (50–80%), high (>80%)
Methods	• Completed 2 MyDispense cases (of their respective year level) in think-aloud interviews: cases of increasing difficulty developed by pharmacists (community, hospital, and academia) ○ review of discharge summaries and pathology reports review ○ therapeutic decision-making • Thematic analysis (Abductive): adapted Clinical Decision-Making Model	MyDispense activity logs analysed & behaviours classified: productive/unproductive Correlations between student behaviours and performance
	Linear regression and ANOVAs	

Spark, M. J., Baverstock, K., Malone, D. T., Maynard, G., & Stupans, I. (2022). Design considerations for cases used in pharmacy teaching and learning using the case difficulty cube. Currents in Pharmacy Teaching and Learning, 14(10), 1246-1255.
Braun, V., Clarke, V., Hayfield, N., Davey, L., & Jenkinson, E. (2023). Doing reflexive thematic analysis. In Supporting research in counselling and psychotherapy: Qualitative, quantitative, and mixed methods research (pp. 19-38). Cham: Springer International Publishing.
Mertens, J. F., Kempen, T. G., Koster, E. S., Deneer, V. H., Bouvy, M. L., & van Gelder, T. (2024). Pharmacists and pharmacy students' perceptions on how a new teaching model supports their clinical decision-making. Currents in Pharmacy Teaching and Learning, 16(10), 102136.
Rutter, P. M., & Harrison, T. (2020). Differential diagnosis in pharmacy practice: Time to adopt clinical reasoning and decision making. Research in Social and Administrative Pharmacy, 16(10), 1483-1486.



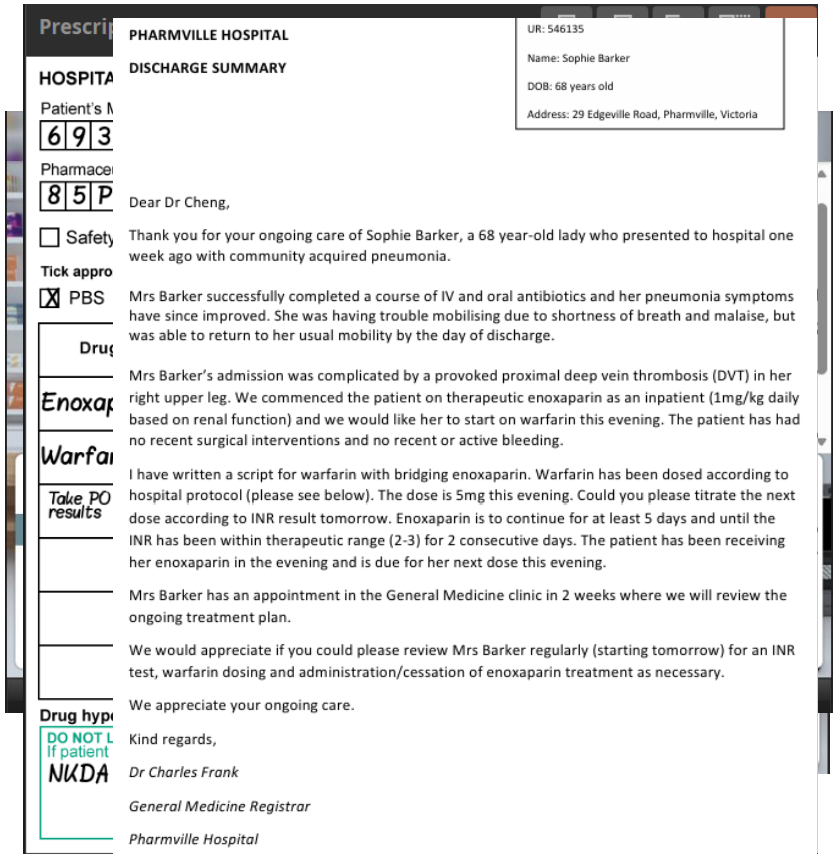
Finding: Behaviours of high vs. low performing students

High-performing students

- Used a **structured flow**
  e.g. opening the discharge summary, checking the patient's history, and asking fact-finding questions
- Carried out **reflective practice** throughout the assessment
  e.g. re-checking their work, case information and references

Low-performing students

- Carried out **additional unnecessary** behaviours
  e.g. opening the counselling section, generating a medication label, searching for medications and opening the fridge and shelves
- **No to minimal engagement in reflective practice** throughout the assessment



PHARMVILLE HOSPITAL

DISCHARGE SUMMARY

UR: 546135
Name: Sophie Barker
DOB: 68 years old
Address: 29 Edgeville Road, Pharmville, Victoria

Dear Dr Cheng,

Thank you for your ongoing care of Sophie Barker, a 68 year-old lady who presented to hospital one week ago with community acquired pneumonia.

Mrs Barker successfully completed a course of IV and oral antibiotics and her pneumonia symptoms have since improved. She was having trouble mobilising due to shortness of breath and malaise, but was able to return to her usual mobility by the day of discharge.

Mrs Barker's admission was complicated by a provoked proximal deep vein thrombosis (DVT) in her right upper leg. We commenced the patient on therapeutic enoxaparin as an inpatient (1mg/kg daily based on renal function) and we would like her to start on warfarin this evening. The patient has had no recent surgical interventions and no recent or active bleeding.

I have written a script for warfarin with bridging enoxaparin. Warfarin has been dosed according to hospital protocol (please see below). The dose is 5mg this evening. Could you please titrate the next dose according to INR result tomorrow. Enoxaparin is to continue for at least 5 days and until the INR has been within therapeutic range (2-3) for 2 consecutive days. The patient has been receiving her enoxaparin in the evening and is due for her next dose this evening.

Mrs Barker has an appointment in the General Medicine clinic in 2 weeks where we will review the ongoing treatment plan.

We would appreciate if you could please review Mrs Barker regularly (starting tomorrow) for an INR test, warfarin dosing and administration/cessation of enoxaparin treatment as necessary.

We appreciate your ongoing care.

Kind regards,

Dr Charles Frank

General Medicine Registrar

Pharmville Hospital

Pharmville Hospital warfarin initiation protocol		
Day	**INR**	**Daily warfarin dose (until next INR test)**
Day 1	Less than 1.4	5mg

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Methods

Participants

	Case 1	Case 2
Participant	Year level	Case 1	Case 2
Y3S1	3	11:05	10:11
Y3S2	3	13:21	15:13
Y3S3	3	18:14	15:58
Y3S4	3	18:46	15:22
Y4S5	3	16:20	13:16
Y3S6	3	08:33	11:16
HP	3	08:39	09:06
CP	3	08:12	08:42

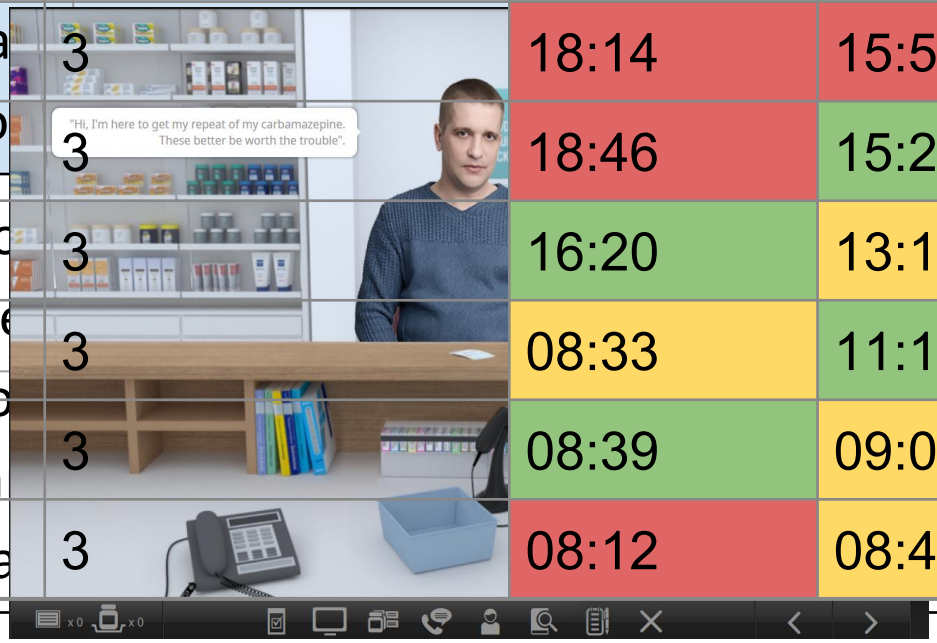
Case Study 2: Qualitative (2026)

Participants

17 students:
5-6 students/ve
convenience an

Case 1

inappropriately high initial dosing of carbamazepine causing toxicity



Case 2

Drug-Drug interaction (Co-
stration of Ramipril and Lithium
g underl

Finding: Level of reasoning

The difference in performance is not *what steps are used* but **how deeply they are used**.

I was just looking into different classes of antihypertensive medications to…determine the right one for him. Just put in **the right one to make sure that they don't interact…** So that's the Aces, but we can't use that because [it] interacts with this, lithium. The sartans also interacts. So yeah, **the next step would be to go with the…Calcium channel blockers, Amlodipine 5 to 10mg** (Y3S2)

…according to **my references**, ramipril could increase the toxicity of his lithium…**So, the problem here is the ramipril dose**. And also the fact that he may be experiencing lithium toxicity….**If the doctor decides** to put him on ramipril after he recovers…**I'll just advise him that he may feel dizzy from the ramipril,** so he should get up gradually from sitting or lying. (Y3S3)

Finding: Prioritisation challenges

3.Clinical reasoning

4.Clinical judgement

5. Shared-decision making

- Students often identify the obvious clinical issue but miss secondary risks
- When multiple issues are present, students struggle to prioritise urgency and severity
- Students lack clinical prioritisation skills, a key component of expert decision-making

‘I wouldn't dispense this. I **don't want this patient to have any…risk** of side effects…Do not dispense. And then I'll click… Dose error.’ (Y3S1)

‘**...ask the patient**, what does he want? If he wants the script dispensed now, because I can't get **in touch with Trudy [the doctor]**, I can. **But**, you know, **he still feels dizzy.** I'm sure that's why he came in to see me, what I can do about it. So, up to him. If you want me to change to something else, I can **call his GP**, who can find… who can get in touch with the neurologist later. (HP)

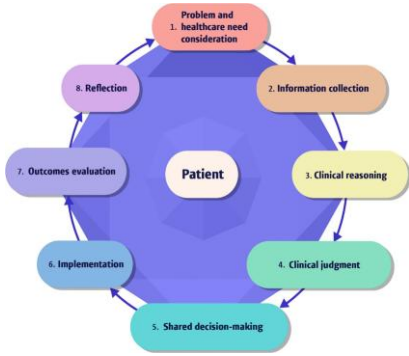
Finding: Limited reflection and metacognition

- Students' reflections aren't as detailed as experts
- Without prompting, students move quickly to answer/solve the case
- When prompted to verbalise their thought process, student are able to identify gaps, assumptions, and uncertainties

I'm just thinking of what to recommend to the doctor. Oh my gosh, **I'm really rusty [with] seizures**. (Y3S3)

'I don't know whether this is really important, but **I would like to ask whether he's like driving** because some patients with seizures are not allowed to drive unless they have the doctor's clearance.' (Y3S3)

Implication: Case design



Through intentional case design, we can encourage productive problem-solving behaviours in MyDispense and help students develop clinical decision-making skills

CDM	Case design
Problem & healthcare need consideration	Give **clear instructions at the start** as to what the students need to do e.g. the diagnosis is correct but there is an MRP you need to find, or you can/cannot contact the doctor.
Information collection	Students should **enter** their **responses** as **free text** rather than selecting options, similar to an OSCE format
Clinical reasoning	Incorporate comparison tasks: “How is this case similar/different to the previous one?”
Clinical judgment	Develop cases that require students to prioritise key issues, weigh risks versus benefits, and incorporate a myDispense feature that allows students to **rank or vote on their priorities**.
Outcomes evaluation	**Scaffold** student responses with **explicit prompts encouraging justification of clinical decisions** (e.g. have you considered risk vs. benefit, alternatives, patient preference, and drug interactions etc.), and **progressively remove these prompts** as students advance through the program to promote independent reasoning.
Reflection	**Prompt** students to include a **reason** for both by they did AND did not dispense

Conclusion

- MyDispense can be a valuable simulation platform for student to practice dispensing in a low-stakes environment.
- The difference in student performance in MyDispense is not what CDM processes were used but how effectively they were used.
- To ensure students develop clinical decision making in MyDispense, cases need to explicitly prompt for reasoning, prioritisation, and reflection.

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Opinions about a Generative Artificial Intelligence tool as a therapeutic reasoning co-coach

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Faculty of Pharmacy and Pharmaceutical Sciences

Supervisors:
Professor Kirsten Galbraith
Dr Kayley Lyons
Professor Tina Brock
Dr Zachari Swiecki

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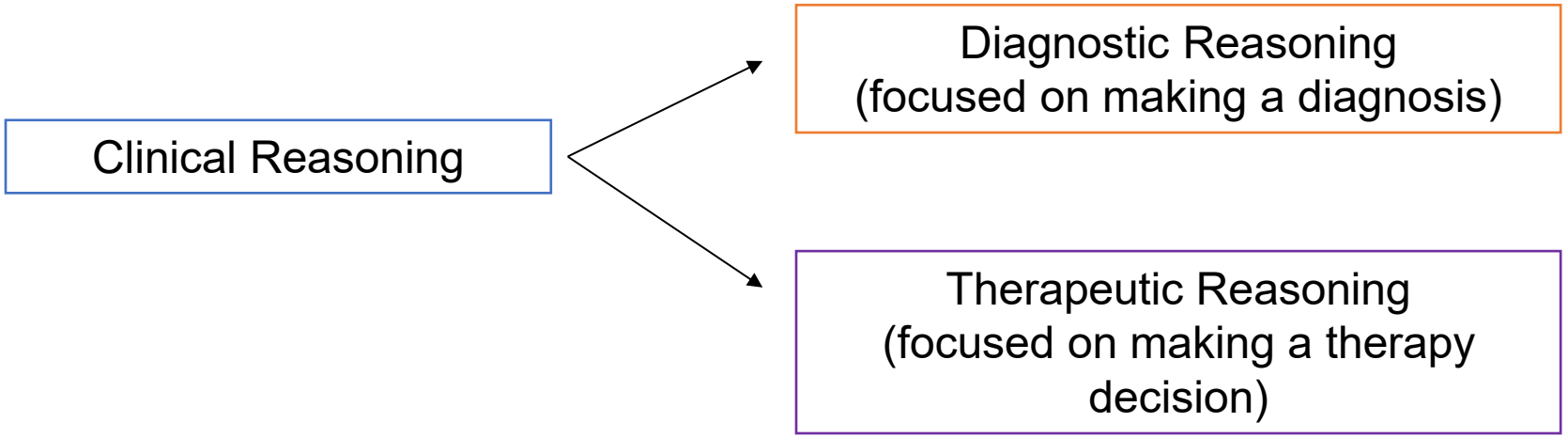
Background and Aim

Therapeutic reasoning is an essential skill

- **Therapeutic reasoning** is an essential skill for healthcare prescribers (current and future)[1]
  - ""the skills, knowledge, and processes required to optimise drug therapy for individual patients"[2]



1.Duong, Q. H., et al. (2023)
2.Anakin, M., et al. (2021)

Current Challenges

- **Mastery** is established with **deliberate practice** and **feedback** (ideally with workplace-based assessment and coaching)[3]

- **Lack of consistency** in quality supervision and **feedback (i.e. Coaching)**[4]

Can generative AI help with this?

3. Ericsson K. A. (2008).
4. Norcini, J., & Burch, V. (2007)

Aims

1.To explore the perceptions of different healthcare learners on **coaching strategies used during experiential learning to support their therapeutic reasoning**

2.To explore the perceptions of different healthcare learners on the **potential use of a generative Artificial Intelligence (genAI) tool to coach therapeutic reasoning**

3.To explore the perceptions of different healthcare learners on the **key characteristics that a genAI tool should possess to effectively coach therapeutic reasoning**

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Methods

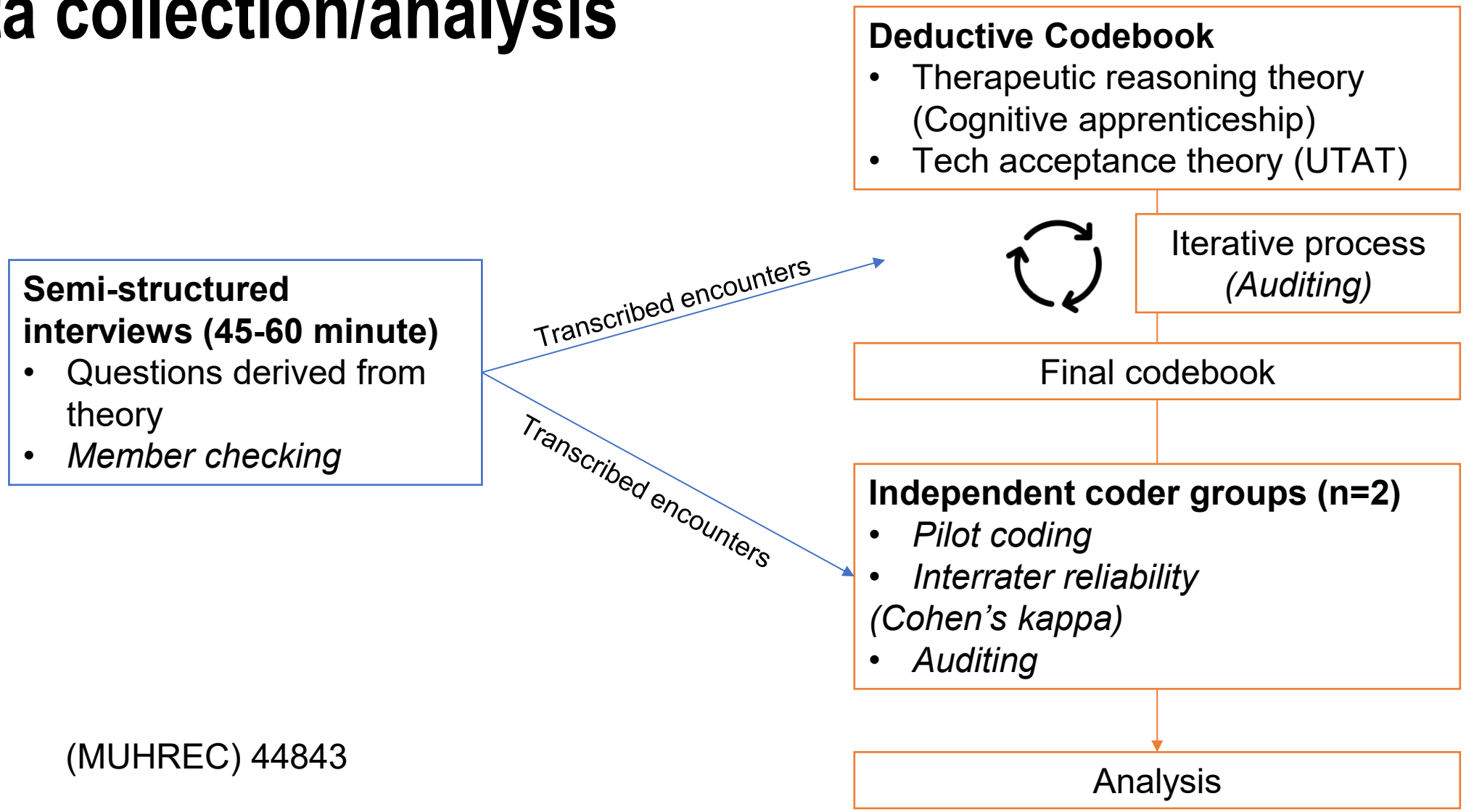
Recruitment Plan

Study design: Qualitative study using semi-structured interviews

Subjects: Healthcare learners with **recent (within last 1-2 years)** experience of **receiving therapeutic reasoning coaching** in an **experiential setting (community or hospital)**

- Pre-registrant (i.e. intern) pharmacists (n=9)
- Currently training independent prescribing pharmacists (n=9)
- Final year medical students (n =9)
- Currently training nurse-practitioners (n = 9)

Data collection/analysis



(MUHREC) 44843

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Results

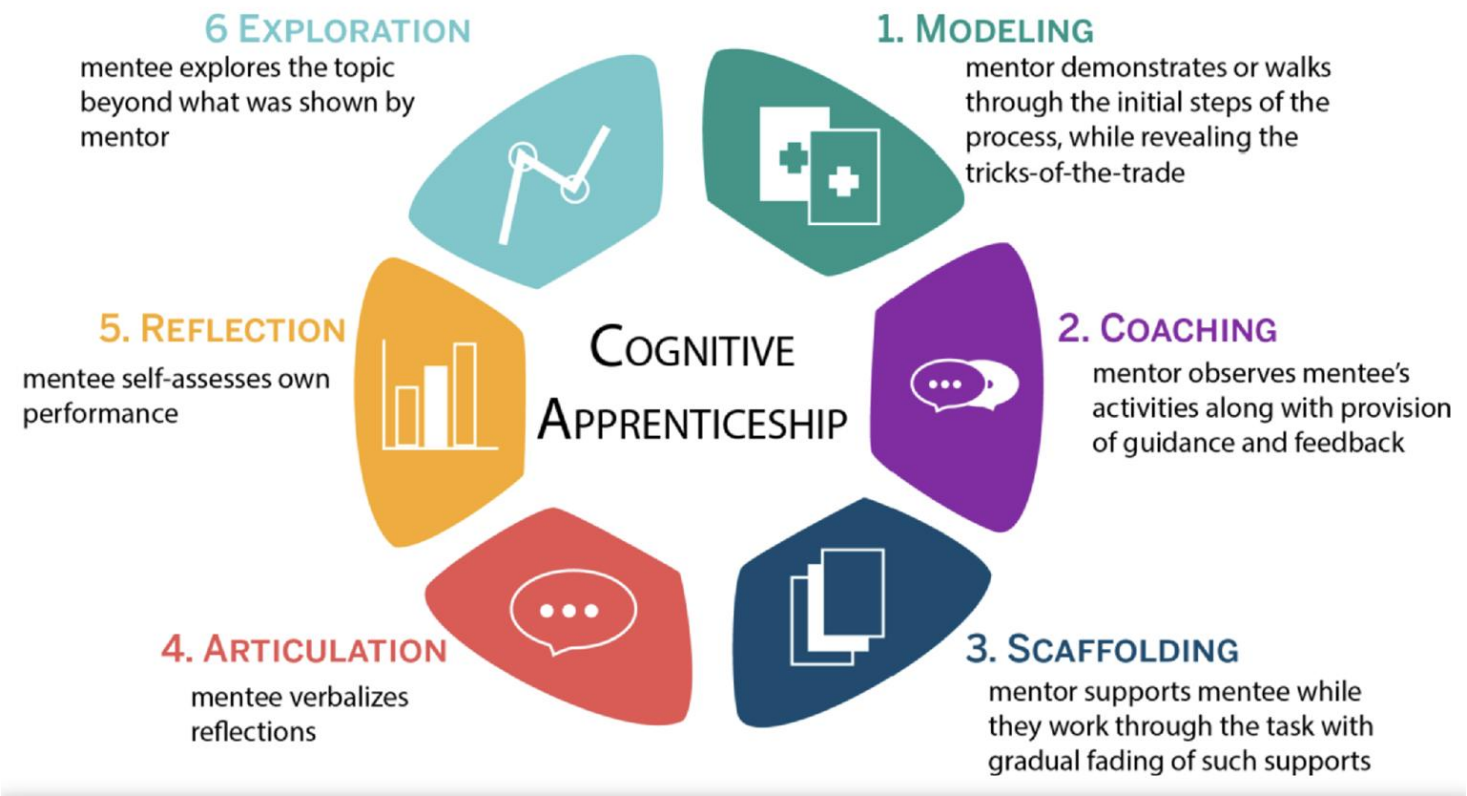
Results

- 24/01/25 – 11/05/26 = 9 interviews conducted and analysed
    - 4 pharmacy interns
    - 2 nurse practitioners
    - 2 prescribing pharmacist
    - 1 medical practitioner

- Total of 277 codes

- Interrater agreement 82%, Cohen’s kappa 0.882

Theory: Therapeutic Reasoning Development[5]



https://educationaltechnology.net/cognitive-apprenticeship/

5. Collins, A., Brown, J. S., & Holum, A. (1991).

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Articulation (n = 41, 14.80%)

- **Effective supervisors encourage learner to verbalise their own thoughts**

“So they generally will ask me what was going through my head at the time of the decision,” [Pharm Intern 1]

- **Potential for genAI tool to use a similar socratic approach**

“AI can, I guess like a good coach, would pick that up and would probably come up with their own probing questions too, which are not ridiculously impossible.” [Pharm Intern 1]

- **Some desire for genAI tool to provide answers directly**

“I would rather the AI give me the answer.” [Pharmacist Prescriber 1]

Domain knowledge (n = 21, 7.60%)

- **GenAI tool potential to support supervisors with knowledge gaps**

“Especially if the preceptor might not have that level of knowledge about that thing, like medication.” [Pharmacy Intern 3]

- **Especially ability to synthesise data from multiple sources**

“I think AI can be helpful because it pulls information much faster, right? I think being able to do that much faster rather than having to purposely go onto a website to search up the therapeutic guidelines and to fish through loads of information and evidence regarding a certain drug or a certain treatment.” [Medical Practitioner 1]

Theory: Acceptance AI[6]

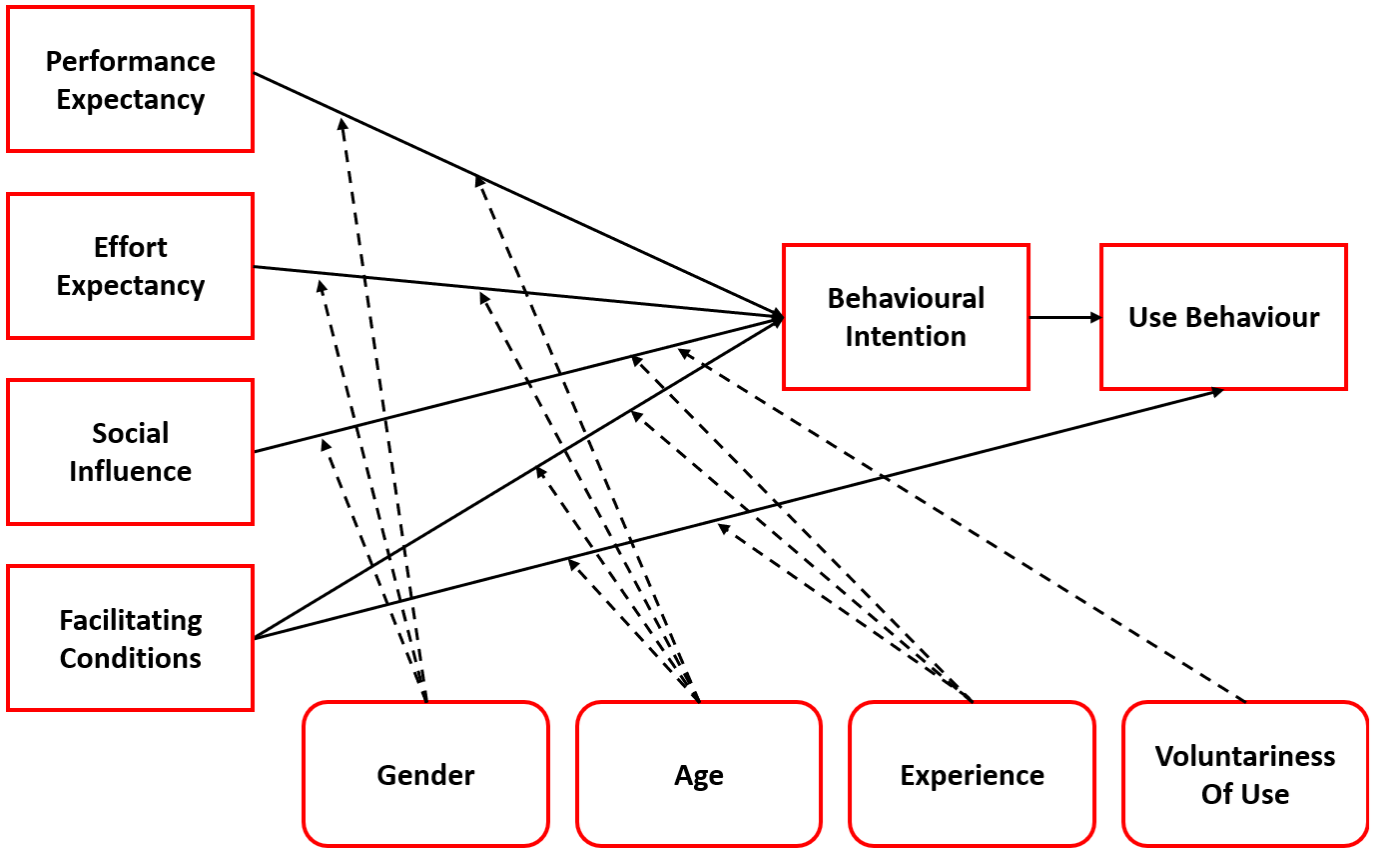

Image: https://acceptancelab.com/unified-theory-utaut

Unified Theory of Acceptance and Use of Technology (UTAUT)

6. Venkatesh, V., et al (2003)

Performance Expectancy (n = 57, 20.60%)

- **Importance of friendliness**

“He was always very clear in that if you don't know and there was never never such a dumb question. He said the only dumb question is the one that's not asked.” [Nurse Practitioner 1]

“I guess they have to be friendly to begin with. It wouldn’t help if the co-coach was always demanding.” [Pharmacy Intern 1]

- **Concern about missing intangible human connection**

“I think one of the really great things about working with a team is that when you get more comfortable with that team, you sort of learn about their family and their lives and stuff like that because you're with them for like eight hours or more a day. So, they become like your second family as some people might say.” [Pharmacy Intern 1]

Effort Expectancy (n=8, 2.90%)

- **Accessibility of the GenAI tool**

“Sometimes the preceptors might be busy… I can understand they might be busy… so I would try to get to them in a timely manner.” [Pharmacy Intern 3]

“*AI doesn’t have barriers. There is no such thing… If it was 3:00 a.m. and you were thinking, did I do the right thing? No one's going to tell you that.”* [Pharmacy Intern 1]

Social Influence (n = 11, 4.0%)

- **Concern over diminishing skills with reliance on GenAI**

"Possibly that people would become reliant on it to feed them the information." [Nurse Practitioner 1]

- **Possible influence of senior hierarchy**

"I think it would depend on how the current senior doctors take it as well… Some doctors are generally more conservative, more traditional you know, more old school like we would call them. And there's nothing wrong with how they're doing things. It's just that sometimes they are not as receptive towards these kinds of innovations and they don't really see the benefit that it brings because to them it's like, oh, the system's been working fine." [Medical Practitioner 1]

Facilitating conditions (n = 10, 3.6%)

- **Data privacy and patient confidentiality**

"...risks of patient confidentiality and perhaps if we did use AI, there's always a risk that you might inadvertently put patient details into it, thereby it's a breach of privacy and can put you at risk of breaching privacy and confidentiality in an organization." [Pharmacy Intern 2]

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Discussion

GenAI use to support clinical reasoning

- Similar optimism and concerns about GenAI use[7-9]

- Existing GenAI use focuses on diagnostic reasoning and virtual patient simulation[10-11]

7. Banerjee M., et al (2021)
8. Khan M., et al (2024)
9. Naseer M., et al (2025)
10. Gordon, M., et al (2024)
11. Afzal S., et al (2020)

GenAI use to support clinical reasoning

- Coaching characteristics align with cognitive apprenticeship model
- Socratic AI tool to support learners through guided questioning[15]
- Concern with over reliance on domain knowledge and impact on reasoning ability[12,13]
- Requirement for interpersonal traits[14]
  - Co-Coach?

12. Kosmyna N., et al (2025)
13. Zhai C, Wibowo S (2024)
14. Cuesta-Martinez R., et al (2024)
15. Li Y., et al (2026)

Conclusion

This study investigated the characteristics desired by different healthcare professional for an AI co-coach tool to support therapeutic reasoning development

Summary of desired characteristics

1. Friendly tone
2. Accessible
3. Reliable synthesis of data
4. Socratic questioning
5. Meaningful feedback
6. Prompting rather than answering
7. Closed system
8. Integrated into current workflow
9. Adaptable
10. Complement rather than replace human coach

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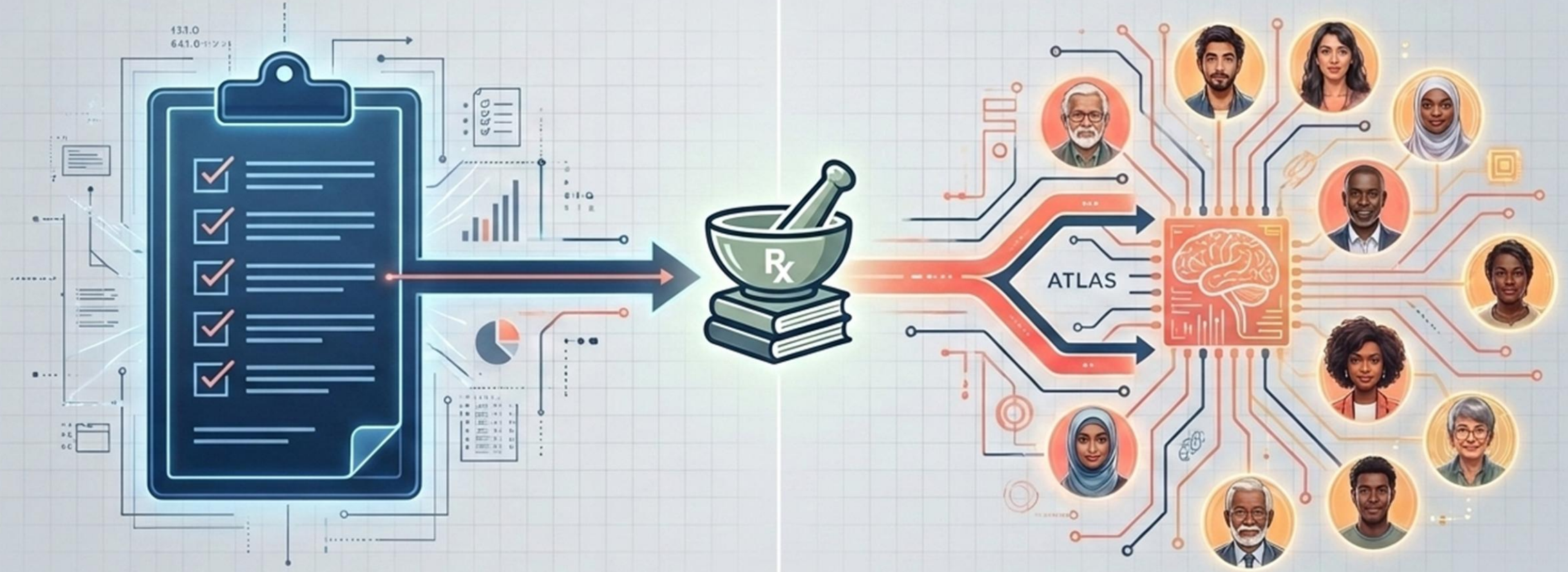
ENGINEERING CULTURAL COMPETENCE

Formative Development of a Questionnaire and GenAI Tool for Patient Diversity Training in Pharmacy Education



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Bridging the Linguistic and Cultural Gap

Tertiary Education

Dominant Language: English

Skills Training

Cultural Competence

Language Proficiency

Better Pharmacy Care

Patient Reality in Malaysia

Primary Language: Bahasa Malaysia

Addressing these gaps through targeted training allows pharmacy students to practice culturally and linguistically appropriate communication, directly enhancing patient-centred care.[1-3]

From Theoretical Concept to Scalable Practice

	Traditional Approach	GenAI Tool (ATLAS)
Linguistic Context	English-dominated, lacks real-world friction	Immersive Bahasa Malaysia
Patient Diversity	Limited to peer/actor demographics	4 distinct, programmatic diverse avatars
Setting Breadth	Static classroom environment	Contextualised Hospital & Community cases
Scalability & Practice	Resource-intensive, limited repetitions	Unlimited, low-stakes iterative practice

The GenAI intervention shifts cultural competency from a theoretical concept to an accessible, scalable practice.

A Two-Pronged Approach to Clinical Preparedness

1. The Intervention

A GenAI-supported simulation tool designed to enhance Malay language competency and preparedness for diverse patient interactions.

2. The Assessment

A validated questionnaire built to measure students' perception and preparedness before using the simulations.

Goal: Culturally Competent Bachelor of Pharmacy Students

Track 1: Contextualised GenAI Scenarios

Local Context

Avatars programmed specifically for Malaysian healthcare scenarios.

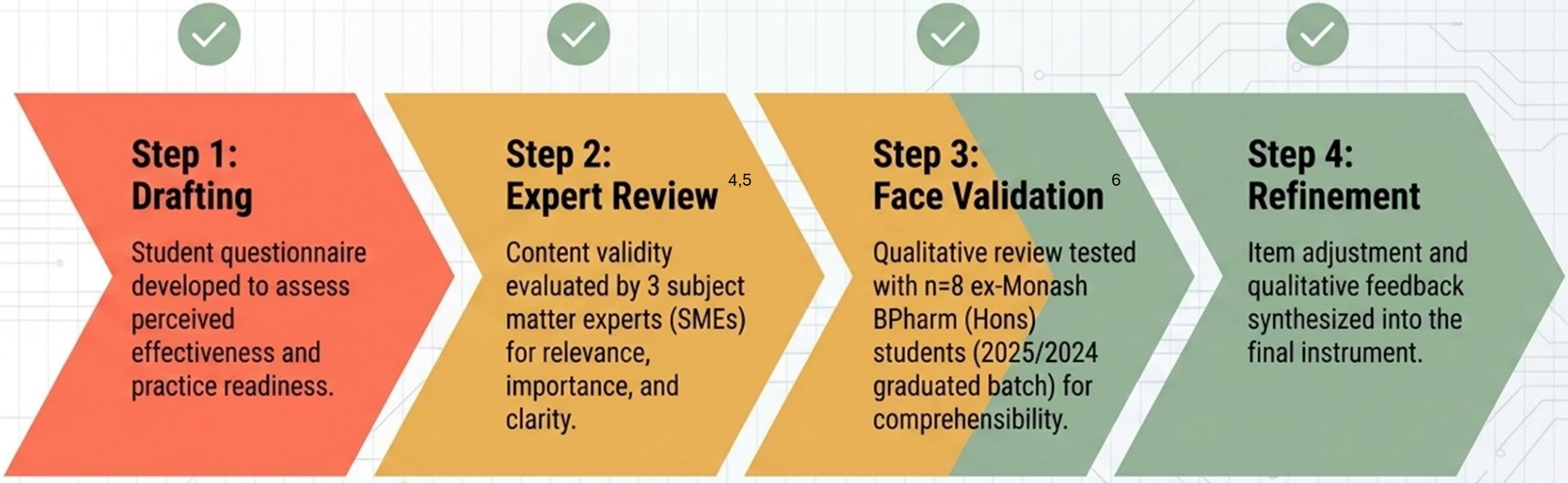
Safe Simulation

Enables risk-free, immersive practice natively in Bahasa Malaysia.

Iterative Scalability

Accessible approach, continuously refined through trial testing for **unlimited student repetitions.**

Track 2: A Four Step Validation Engine



Step 2: Exceptional Content Validity

Relevance

Instrument is highly relevant to clinical practice.

Importance

Critical for measuring true preparedness.

Clarity

Unambiguous and easily understood by the target demographic

Expert Review (n=3) confirms the statistical robustness and **exceptional contextual relevance** of the assessment instrument.

Step 3: Qualitative Face Validation Parameters

Time & Format

Assessing questionnaire length (< 5 mins vs > 5 mins) and response structure layout.

Clarity & Readability

Identifying specific wording issues and opportunities for granular refinement.

n=8 Ex-BPharm Students

Relevance

Ensuring content aligns with the practical expectations of the student participant.

Appropriateness

Flagging potentially insensitive, inappropriate, or culturally offensive material.

Step 4: Synthesizing the Feedback Loop

Action Matrix

Validated

Length was optimal (completion time evenly split with 4 students at <5 mins and 4 at >5 mins).

Overall general comprehensibility confirmed (5 out of 8 provided no critical comments).

Retained with Nuance

Items 2D (Socioeconomic Status) and 2G (Frequency of Communication) were perceived as irrelevant by some, but strategically retained as critical baseline study metrics.

Item 2E (School type): 'Other' option deemed sufficient over adding specific private school modifiers.

Refined for Clarity

Item 4C: The core purpose of the question was unexplained to participants (n=3). Instructions and wording were fundamentally reviewed to ensure the explicit intent is clear.

Project Roadmap

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Hospital preceptors

Scaling the Sandbox

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