

Rethinking Assessment for future-ready graduates: Making learning visible through Objective Structured Practical Examinations (OSPES)

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Why rethink assessment now?

- Generative AI has changed *what* students can produce.
- The real problem isn't cheating - it's **invisible learning**.
- We can no longer rely on products alone (reports, answers, calculations).
- Need for performance-based measurement of learning
- Desire to assess practical and applied reasoning in a laboratory curriculum.

If learning is increasingly invisible in what students submit, the real question becomes:

How do we design assessments that let us see learning again?

What do we mean by 'Making learning visible'?

- Visible learning = reasoning, decision-making, justification, application.
- In pharmacology/science:
 - Why did they choose this mechanism?
 - How did they interpret uncertainty?
 - Can they apply concepts to unfamiliar contexts?



A case study of assessment redesign

Context:

- BPS2011 - 2nd year pharmacology unit
- Focus on biochemical signalling
- Cohort size ~200 students
- High-stakes assessment point

What would assessment look like if we designed it around visibility of learning in a Generative AI era?

What I'll share next is what we actually did - the assessment design choices we made, what we started seeing in student learning, and what that taught us.



BPS2011 – Assessment overview 2024



Assessment Overview

Assessment	Value	Week due	Learning Outcomes
Assessment 1: Participation in interactive lectures and forums	5%	On-going	1 - 5
Assessment 2: Progress tests: individual	15%	Weeks 5,9, and 12	1 - 5
Assessment 3: Team outputs from workshop sessions (moderated by Feedback Fruits)	10%	Weeks 4, 8, and 10	6 & 7
Assessment 4: Laboratory reports: individual	30%	On-going	6 & 7
Assessment 6: End-of-semester Final Exam: individual	40%	Examination period	1 - 7

BPS2011 – Assessment overview in 2025



Assessment Overview

Assessment	Value	Week due	Learning Outcomes
Assessment 1: Progress tests: individual (on-campus; invigilated)	15%	Weeks 5, 9, and 12	1 - 6
Assessment 2: Workshop outputs: team	15%	Weeks 2, 6, and 8	1-7
Assessment 3: Laboratory outputs: individual	30%	On-going	1-7
Assessment 4: End-of-semester Final Objective Structured Practical Examination: individual (on-campus; invigilated)	40%	Examination period	1 - 7

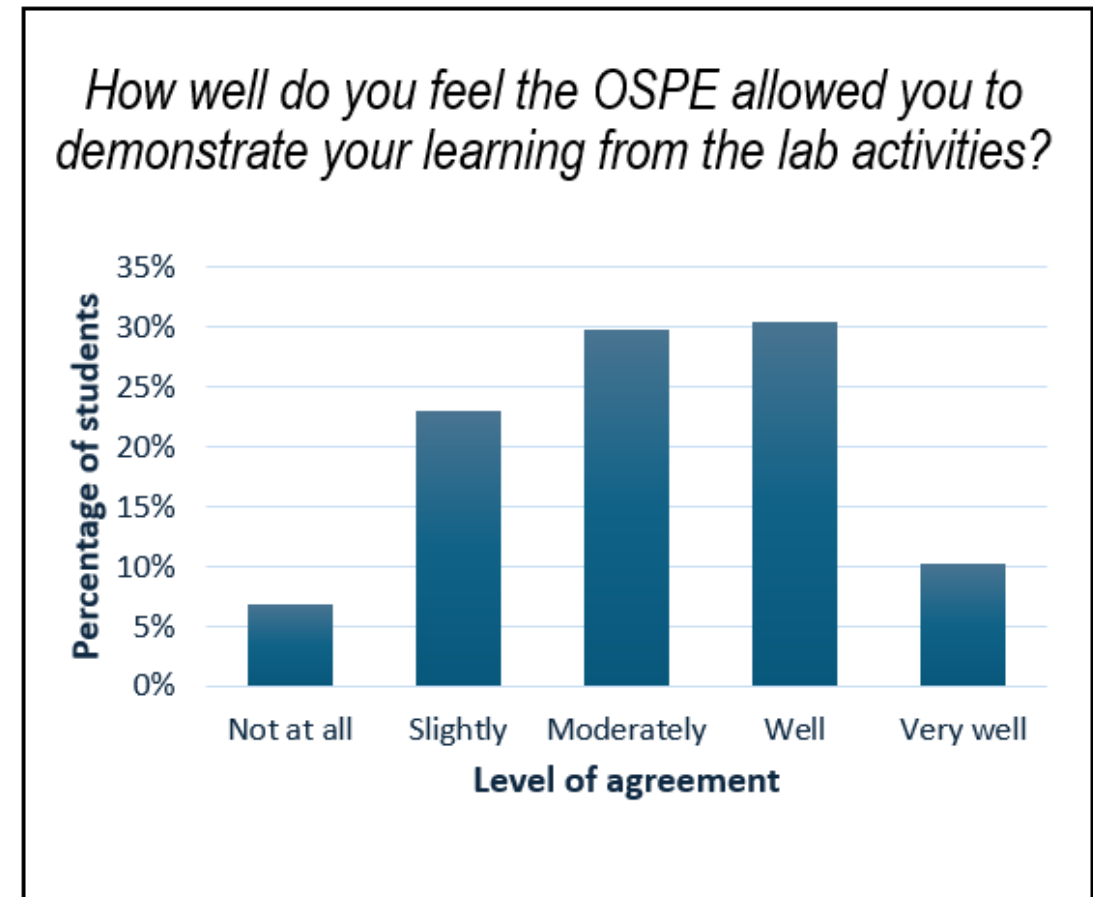
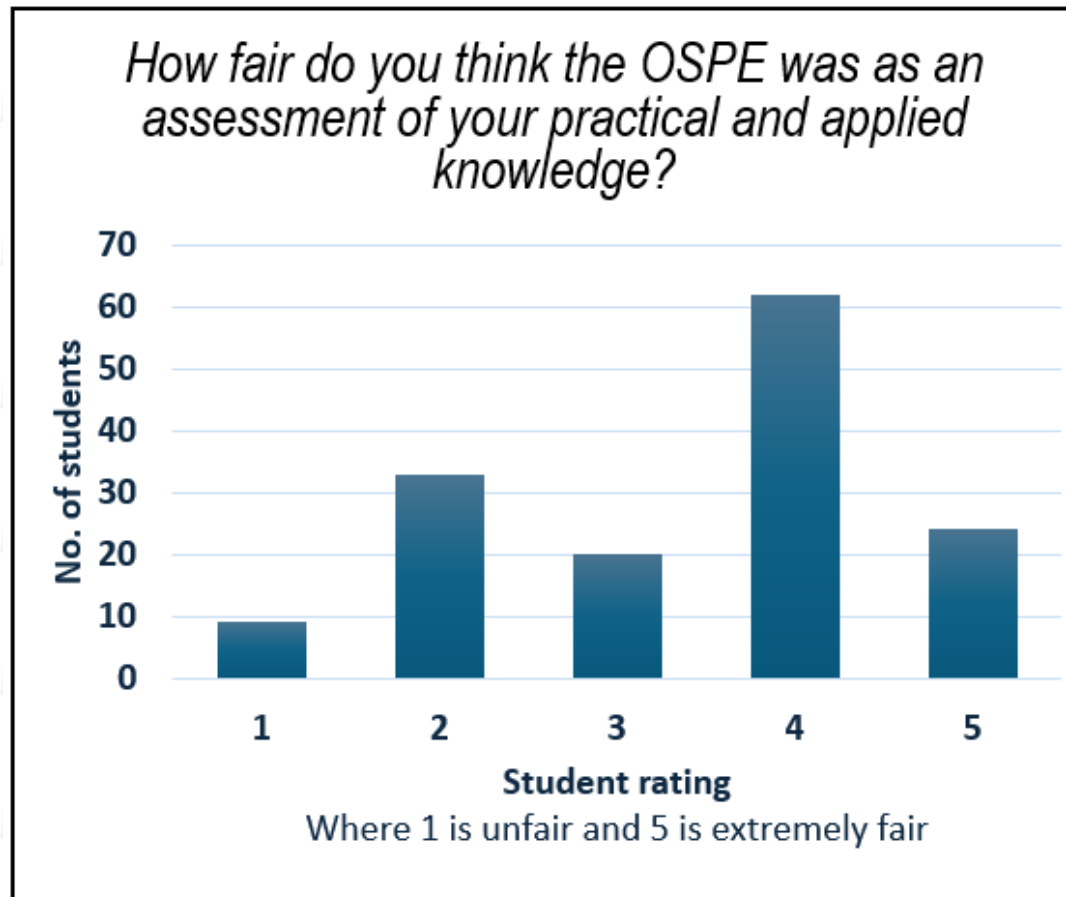
a BIG change in BPS2011 in 2025...

**End of semester written exam replaced with a
3 station OSPE**

What did the students tell us?

(n=153, 77% response rate)

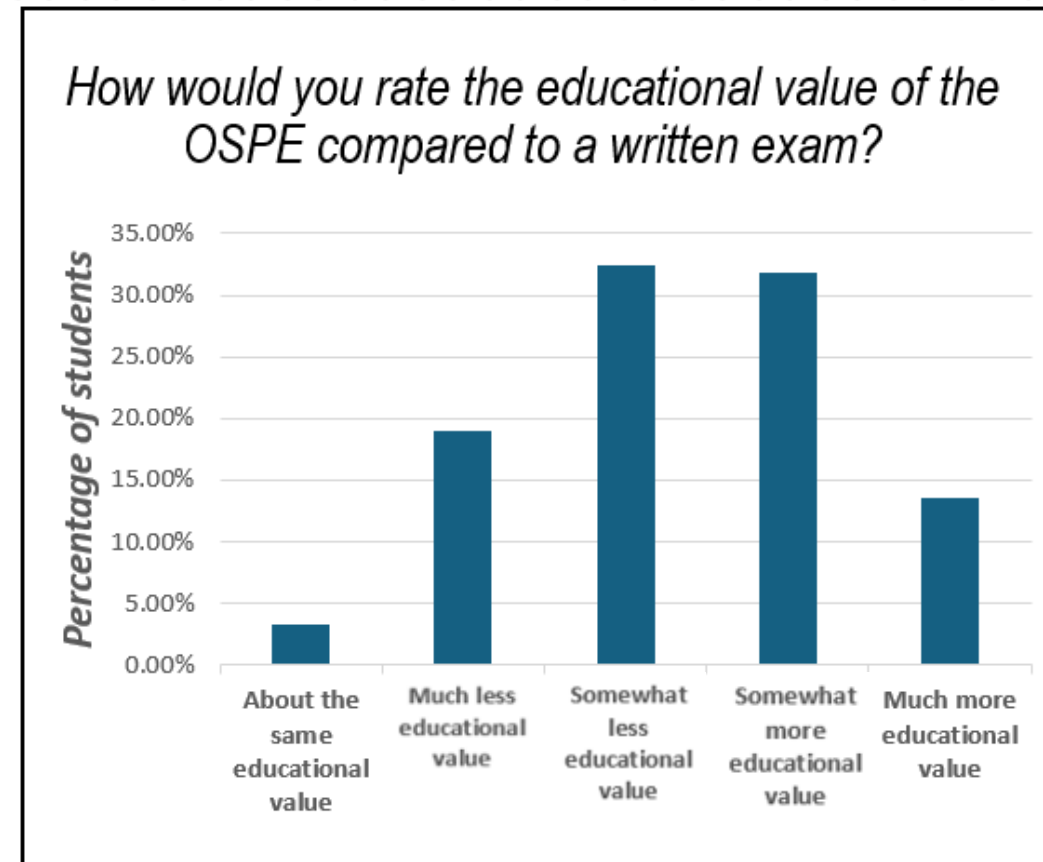
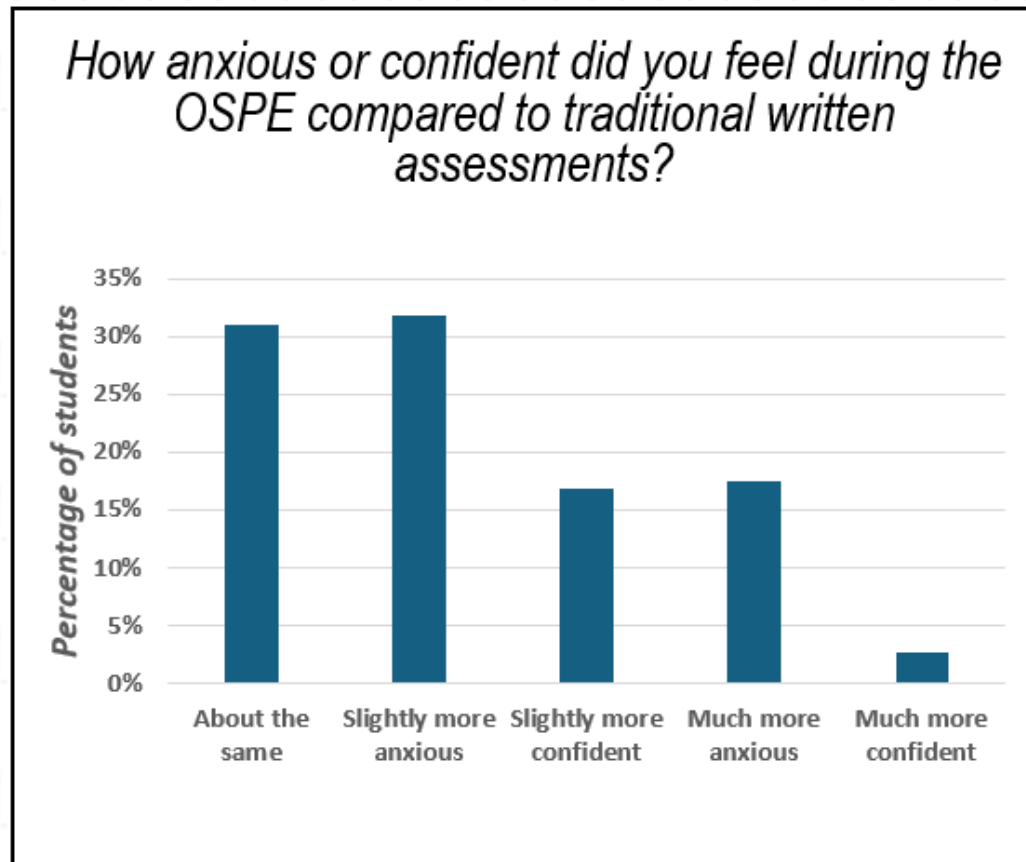
Fairness & learning: moderate



What did the students tell us?

(n=153, 77% response rate)

Experience: anxious...but educationally richer?



What did the students tell us?

(*n*=153, 77% response rate)

Preparation technique

OSPE preparation technique	Percentage (%)
Reviewed lab notes and worksheets	75%
Attended lab classes consistently	73%
Practised with peers	35%
Used practice OSPE resources (e.g., mock questions)	70%
Revisited feedback from previous lab activities	55%
Other	15%

What did the students tell us?

(n=153, 77% response rate)

Preparation methods - Other

"I practised explaining concepts out loud...speaking to myself, role-playing questions, and focusing on clarity and pronunciation."

"I used AI to revisit and revise key concepts, generate practice questions, and critique my responses."

"I tested my understanding by throwing questions at AI and then practising how I would respond verbally under time pressure."

"I created cue cards and diagrams to explain processes in depth, especially receptor mechanisms."

"I worked through all the laboratory content, connecting it back to core theory and focusing on reliability, accuracy, and experimental interpretation."

"I practised verbalising content through conversations with friends, reviewing lab reports, and recording myself to refine my explanations."

What did the students tell us?

(n=153, 77% response rate)

What students found most challenging

Q11. What did you find most challenging about the OSPE format?

Themes	Quotes
Timing	"The lab wasn't enough time to complete everything required so more time even 5-10 more minutes would be extremely helpful"
	"Station 1- Finishing all the tasks in this Station was tough"
	"The very short amount of time provided to complete the laboratory activities."
Verbal reasoning	"Just verbal reasoning behind the concepts were tricky, as many things written on paper didn't translate well into my head and verbally "
	"It is more challenging to present ideas vocally rather than written. "
	"Didn't have any authentic practice with the verbal component so it was difficult to gain confidence with. "
Question content and or unfamiliarity	"Calculating the dilutions in the lab, due to the uneven dilution factors, decimals, and having to convert between mass conc. and molar concentration."
	"The verbal consult questions clearly required very specific answer despite being very open ended and vague questions that could be answered in lots of different ways."
	" Preparing so much to only get 4 questions all that study feels like a waste "

What did the students tell us?

(n=153, 77% response rate)

What students found most surprising

Q12. What surprised you most about the OSPE experience?

Themes	Quotes
Speed of OSPE	"How fast the time went!"
	" Time management to do dilutions twice within 30min"
	" Time constraints on the lab"
Question content	"The difficulty of converting thoughts into words "
	"The depth of the knowledge tested. "
	"The knowledge is being asked in a more dept way that expected"
The atmosphere of the experience	"The TAS/ examiners were very relaxed ? And it felt comforting and made me much less nervous"
	"How simple but effective it was "
	"It's better than traditional exams where we get breaks in between "

OSPE structure at a glance

Station 1: Practical Station

Location: Teaching labs (e.g., 314A/B)

Time: 30 minutes (10 min reading time prior to beginning)

You will be assessed on:

- ☐ Safety and procedural compliance
- ☐ Experiment planning based on a given objective
- ☐ Calculations (e.g., dilutions, concentrations)
- ☐ Pipetting technique and serial dilution accuracy
- ☐ Data interpretation and evaluation

Station 2: Verbal Consult – Defending Experimental Decisions

Location: Consulting suites / designated workshop rooms

Time: 7 minutes (5 min reading time prior to beginning)

You will be assessed on:

- ☐ Your ability to interpret example data
- ☐ Your ability to justify decisions in terms of methodology, data analysis, and interpretation
- ☐ Verbal communication

Station 3: Verbal Consult Explaining Concepts

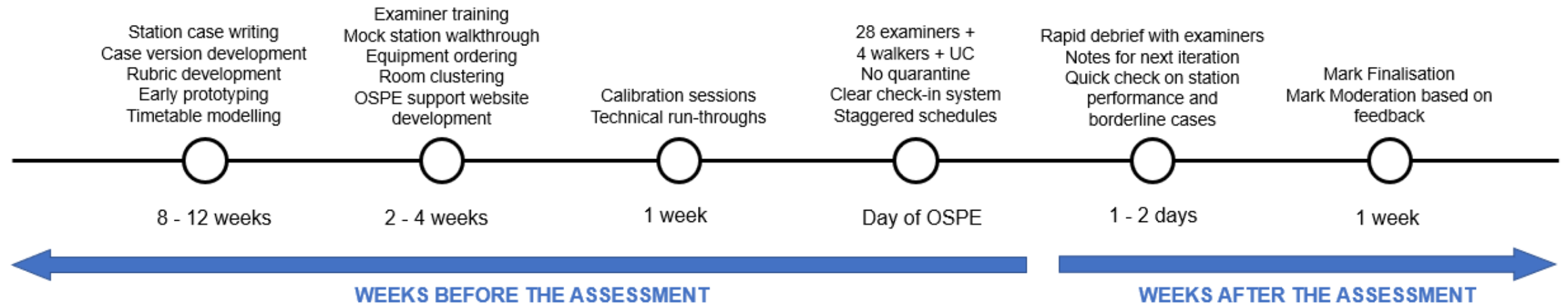
Location: Consulting suites / designated workshop rooms

Time: 7 minutes (5 min reading time prior to beginning)

You will be assessed on:

- ☐ Your ability to explain a key concept or technique from the unit's labs
- ☐ Verbal communication

Logistics and implementation



Lessons learnt

- Separate days for lab vs verbal stations
- Tighter integrity procedures
- Deeper calibration of case versions upfront. Early prototyping / refinement of station & rubrics
- Have contingency plans for everything!
- Practical stations need longer piloting
- Clearer scripts reduce cognitive load
- Students need explicit OSPE-thinking practice
- Logistics matter more than you think

Station 3 – Version 1 – Objective Structured Checklist

Analytical Checklist

Each criterion below is scored 1 = Yes, 0 = No (or N/A where appropriate).

Criterion	Yes (1)	No (0)	Comments
Explains that CAMYEL is a BRET-based biosensor that detects conformational changes in response to cAMP binding	☐	☐	
Describes that BRET ratio decreases when cAMP levels increase, as the conformational change increases the distance between donor (luciferase) and acceptor (YFP)	☐	☐	
Connects that forskolin increases cAMP by activating adenylyl cyclase, while M2/M4 muscarinic receptors (via Gi/o) inhibit cAMP production	☐	☐	
Explains that the assay enables real-time, indirect measurement of cAMP changes in live cells	☐	☐	
Identifies that mechanical stimulation (e.g. plate bumping or media changes), can activate signalling pathways through mechanosensitive membrane proteins (e.g., Piezo, TRP, ion channels), potentially confounding experimental outcomes.	☐	☐	
Explains that avoiding mechanical disturbance is important to maintain assay specificity and data integrity	☐	☐	

Communication Checklist

Criterion	Yes (1)	No (0)	Comments
Communication is clear, concise, and demonstrates command of scientific explanation	☐	☐	
Explanation follows a logical progression (e.g. connects CAMYEL readout to GPCR signalling)	☐	☐	
Response is fluent, well-paced, and appropriately timed within the 7-minute limit	☐	☐	
Uses appropriate terminology (e.g., cAMP, BRET, GPCR,) and explains terms when needed	☐	☐	
Responds to follow-up prompts confidently and appropriately, showing active listening	☐	☐	
Uses appropriate tone and expression to maintain engagement (e.g., confident tone, eye contact, calm delivery)	☐	☐	

Total Marks: /12

Similar to the comments below, with ALL versions of station 3; the yes, no system is clear IF there is only one thought in each section - some students would say the first half of a criteria but not the second. If the two points were made different criterion then it would be easier to have a yes no system

not all students said both points consider whether you want and AND or and OR statement here

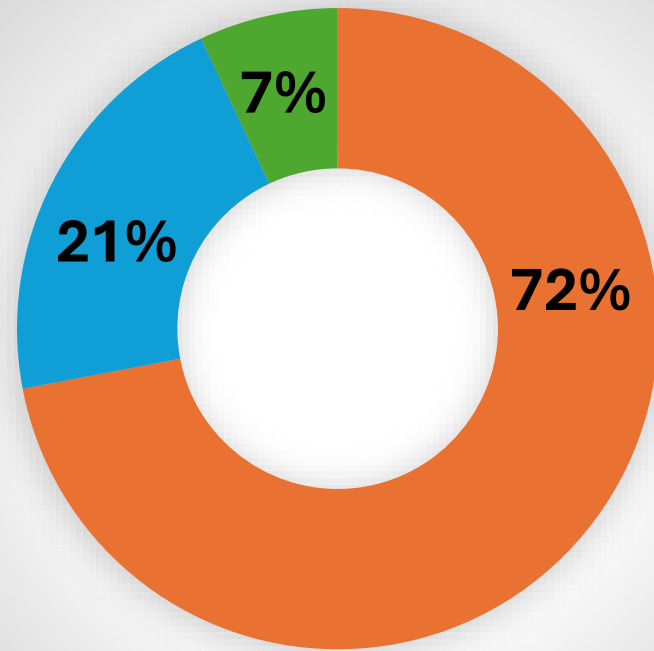
not all students said both points consider whether you want and AND or and OR statement here

not all students said both points consider whether you want and AND or and OR statement here. Also Not many students mentioned this.

I observed this too, where not many students explicitly mentioned the real-time and indirect measurement of cAMP. Perhaps it might be more effective to have multiple prompts with reading/thinking time between each one so they can give more focused/direct answers.

What's next?

Would you support the use of OSPEs in other science/laboratory-based units?



Yes No Not sure

2025 Cohort size: ~200 students

OSPE average: 70.14%

Station 1 average: 64%

Station 2 average: 73%

Station 3 average: 74%

Fails: 8%

What's next?

- Link to core concepts...?

Recently awarded grants

Faculty Education Innovation Grant

Bridging Learning and Assessment: Developing Prep-to-Practice Modules for Pharmacology OSPEs

Nilushi Karunaratne, Karen Gregory, Lauren May, **Sadia Alvi**, Edris Chan, Betty Exintaris

Faculty Education Research Grant

Core Concepts and metacognition in a pharmacology Objective Structured Practical Examination

Nilushi Karunaratne, **Sadia Alvi**, Edris Chan, Karen Gregory, Lauren May, Betty Exintaris



Acknowledgements

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All the examiners and facilitators



What we assessed and how

Station 1: Practical Station (10 min reading + 30 min lab)

Students demonstrate hands-on laboratory skills, accuracy in performing techniques, and ability to troubleshoot experimental procedures.

Students are assessed on their ability to:

1. work safely and effectively within the lab environment;
2. design and perform a serial dilution using Allura Red dye, and;
3. analyse and evaluate a protein assay dataset.

TASK 2: EXPERIMENTAL DESIGN AND EXECUTION

2A: Demonstrate your experimental skills by designing and generating a standard curve using serial dilutions of AlluraRed dye, creating independent technical duplicates (i.e. **make each sample twice**). Once completed, transfer 100 μ L from each sample to a 96-well plate. Show your calculations for each sample and then complete the dilution table below. Calculate the Molar concentration of Allura Red in each sample and enter this information into your dilution table.

Reagents provided:

Diluent: distilled water

Allura Red AC, MW: 496.43 g/mol - **refer to bench label for concentration**

SAMPLE	[FINAL] ug/mL	[INITIAL SAMPLE]	VOLUME OF INITIAL SAMPLE	DILUENT VOLUME	Log[AlluraRed], M
1	40				
2	20				
3	8				
4	3.2				
5	1.2				
6	0				N/A

Space for your calculations:

2B: Your pipetting accuracy will be assessed based on the standard deviation between technical replicates and linearity of the absorbance vs concentration plot. Indicate in the plate map below where your samples are located.

PLATE NUMBER: _____

	REPLICATE 1						REPLICATE 2						STUDENT ID
	1	2	3	4	5	6	7	8	9	10	11	12	
A	1	2	3	4	5	6	1	2	3	4	5	6	
B	1	2	3	4	5	6	1	2	3	4	5	6	
C	1	2	3	4	5	6	1	2	3	4	5	6	
D	1	2	3	4	5	6	1	2	3	4	5	6	
E	1	2	3	4	5	6	1	2	3	4	5	6	
F	1	2	3	4	5	6	1	2	3	4	5	6	
G	1	2	3	4	5	6	1	2	3	4	5	6	
H	1	2	3	4	5	6	1	2	3	4	5	6	

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MATERIAL SAFETY DATA SHEET (MSDS) #1

SUBSTANCE:	Allura Red AC Formula: $C_{16}H_{14}N_2Na_2O_8S_2$ Molecular Weight: 496.42 g/mol CAS-No.: 25956-17-6
ALTERNATIVE NAMES:	None known
USES OF SUBSTANCE:	For R&D use only; not for pharmaceutical, household or other uses.
HAZARDS IDENTIFICATION:	Not a hazardous substance or mixture

MATERIAL SAFETY DATA SHEET (MSDS) #2

SUBSTANCE:	Bovine Serum No.: 1943609-65-1 Original source: bovine fetus Origin: Australia Purity: sterile-filtered, irradiated. Form: sera, serum
HAZARDS IDENTIFICATION:	R&D use only; not for pharmaceutical, household or other uses. Not a hazardous substance or mixture

1943609-65-1, version 6.2, revision date: 26.01.2024, downloaded from <https://www.sigmaaldrich.com/product/sial/1943609-65-1> accessed on 30-MAY-2025.
1943609-65-1, version 6.3, revision date: 20.12.2024, downloaded from <https://www.sigmaaldrich.com/product/sigma/12007c> accessed on 10-JUN-2025.

TASK 1: WORKING SAFELY WITHIN THE LABORATORY

1A: Complete the risk assessment table below for experimental techniques participated in during semester.

TECHNIQUE	RISKS & HAZARDS	MITIGATION STRATEGIES
Chemical handling (see MSDS #1)		1)
Cell imaging	Genetically modified CHO cell lines - individual exposure	1)

1B: How might accidental ingestion of the **substance listed in MSDS #2** affect gut function? Explain your reasoning based on your knowledge of how this substance influences different proteins, intracellular signalling and tissue types within the gastrointestinal tract.

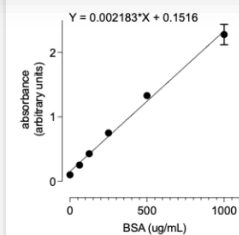
Substance name: _____
Answer: _____

Continues over page

PREPARED EXPERIMENTAL DATA

BSA is a protein assay performed in duplicate, where absorbance is labelled with the absorbance reading for an unknown sample (enter this information in the table below). Based on the information provided, calculate the protein concentration in the unknown sample (enter your answer in the table below).

Space for your calculation:



Unknown sample absorbance:	
Calculated protein concentration:	

3B: Briefly, outline any suggested changes for repeating the experiment and/or presenting the data.

Suggested changes:	
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What we assessed and how

Station 1: Practical Station (10 min reading + 30 min lab)

BPS2011_OSPE_LAB_RUBRIC

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Students' performance was assessed through their responses recorded on their worksheet and in-lab observation.

What we assessed and how

Station 2 and 3: Verbal Consult Stations (5 min reading + 7 mins to respond)

Station 2:

Students reviewed example experimental data and responded verbally to questions about the design, analysis, and interpretation of the experiment.

Students were assessed on their scientific reasoning and their ability to clearly justify their decisions.

Station 3:

Student's explained a key concept or technique drawn from one of the unit's laboratory activities.

Students were assessed on their understanding and your ability to clearly and confidently communicate the concept.

acetylcholine receptors (M3 mAChR). The aim was to monitor extracellular signal-regulated kinases 1 and 2 (ERK1/2) phosphorylation in response to increasing concentrations of carbachol, a muscarinic agonist. You generate a concentration-response curve based on FRET ratio changes of an ERK1/2 biosensor in the absence or presence of U0126.



Station 2 – Version 1 – Objective Structured Checklist

Analytical Checklist

Each criterion below is scored 1 = Yes, 0 = No (or N/A where appropriate).

Criterion	Yes (1)	No (0)	Comments
Suggests a publication-relevant suggestion, such as: - Add Y-axis labels with units OR how FRET ratio was normalised - Include the biological replicate number. - Remove error bars if only n=1 OR define error as SD or SEM - Include a graph title. - Include the concentration of U0126 used. - Include a figure legend describing experimental conditions - Annotate the statistical significance between the two curves. - Include the nonlinear regression equation used to fit the data in the legend	☐	☐	
Suggests a publication-relevant suggestion	☐	☐	
Suggests a publication-relevant suggestion	☐	☐	
Suggests a publication-relevant suggestion	☐	☐	
Correctly explains that ERK1/2 phosphorylation downstream of M3 mAChR activation is reduced due to MEK1/2 inhibition by U0126	☐	☐	
Accurately connects M3 → Gq → PKC → Raf → MEK1/2 → ERK1/2, showing that MEK is essential for the observed signalling response	☐	☐	

Communication Checklist

Criterion	Yes (1)	No (0)	Comments
Communication is clear, concise, and demonstrates command of scientific explanation	☐	☐	
Explanation follows a logical progression	☐	☐	
Response is fluent, well-paced, and appropriately timed within the 7-minute limit	☐	☐	
Uses appropriate terminology (e.g., MEK1/2, inhibitor, ERK1/2) and explains terms when needed	☐	☐	
Responds to follow-up prompts confidently and appropriately, showing active listening	☐	☐	
Uses appropriate tone and expression to maintain engagement (e.g., confident tone, eye contact, calm delivery)	☐	☐	

[EXAMINER RESOURCE – VERSION 1]

BPS2011 Objective Structured Practical Examination

Station 2: Verbal Consult (Defending Experimental Decisions)

Station time: 15 minutes

Reading time: 5 minutes

Response time: 7 minutes

Overview

In this station, you will review example experimental data and respond to questions about the design, analysis, and interpretation of the experiment, your scientific reasoning and ability to clearly justify your decisions.

Please turn over the page for the station task.

You will be presented with both the **prompt** and the **follow-up**.

A blank piece of paper and pen is provided for your use to sketch and/or explain concepts if required.

[EXAMINER INSTRUCTIONS]

- For each prompt, you are able to probe the student ONCE.
- Suggested phrasings – can you expand on that? Would you like to add anything else? Etc.

The Impact of Interruptions and Distractions on Pharmacists' Clinical Decision-Making and Task Prioritisation: A Mixed- Methods Study Using MyDispense



Presenter: Meaza Ayanaw

Assoc/Prof Dan Malone , Dr Thao Vu, Dr Harjit Khera, Dr Angelina Lim

Background



\$42 billion

annual global financial
burden resulting from
medication errors¹



5-6%

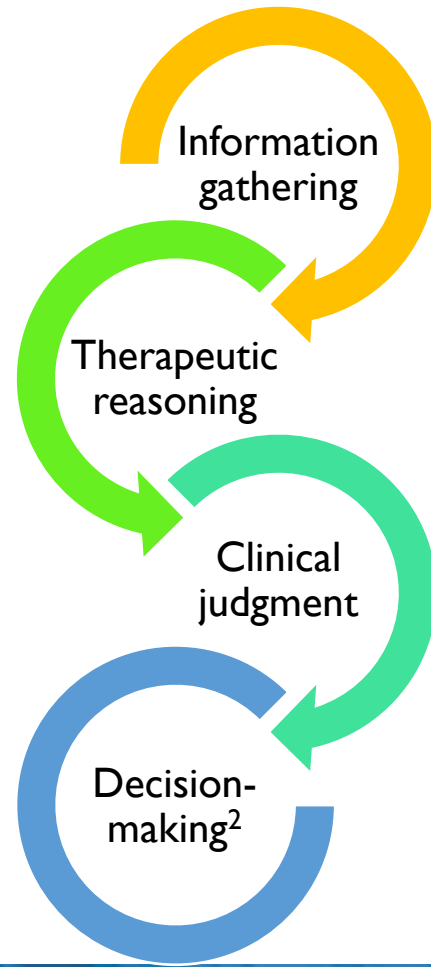
of all hospital admissions are
caused by preventable
medication errors²

Pharmacists are the final safeguard against prescribing mistakes, but an overloaded environment forces them to become sources of error themselves

1. World Health Organization. Medication Without Harm. Geneva: World Health Organization; 2017.
2. Tariq RA et al. Medication Dispensing Errors and Prevention [Internet]. 2023. PubMed PMID: 30085607.

Clinical Decision Making (CDM) and Task Prioritisation

CDM uses cognitive and metacognitive processes for patient-focused therapeutic decisions¹



Prioritisation

- Focusing on high-risk patients and critical tasks
- Enhance CDM efficiency and workload management³

1. Wright et al. Clinical decision-making: An essential skill for 21st century pharmacy practice. *Res Soc Adm Pharm.* 2019;15:600-6.
2. Duffull et al. Understanding the process of clinical judgement for pharmacists when making clinical decisions. *Res Soc Adm Pharm.* 2019;607-14.
3. McGlynn et al. How we equip undergraduates with prioritisation skills using simulated teaching scenarios. *Med Teach.* 2012;526-9.

Distractions and Interruptions



Distractions

External stimuli that divert attention without halting the task at hand¹



Interruptions

Breaks in task performance initiated by internal or external sources²



Workplace
Stress &
Burnout



Compromised
Record-Keeping



Professional
Misconduct



Depression &
Substance use

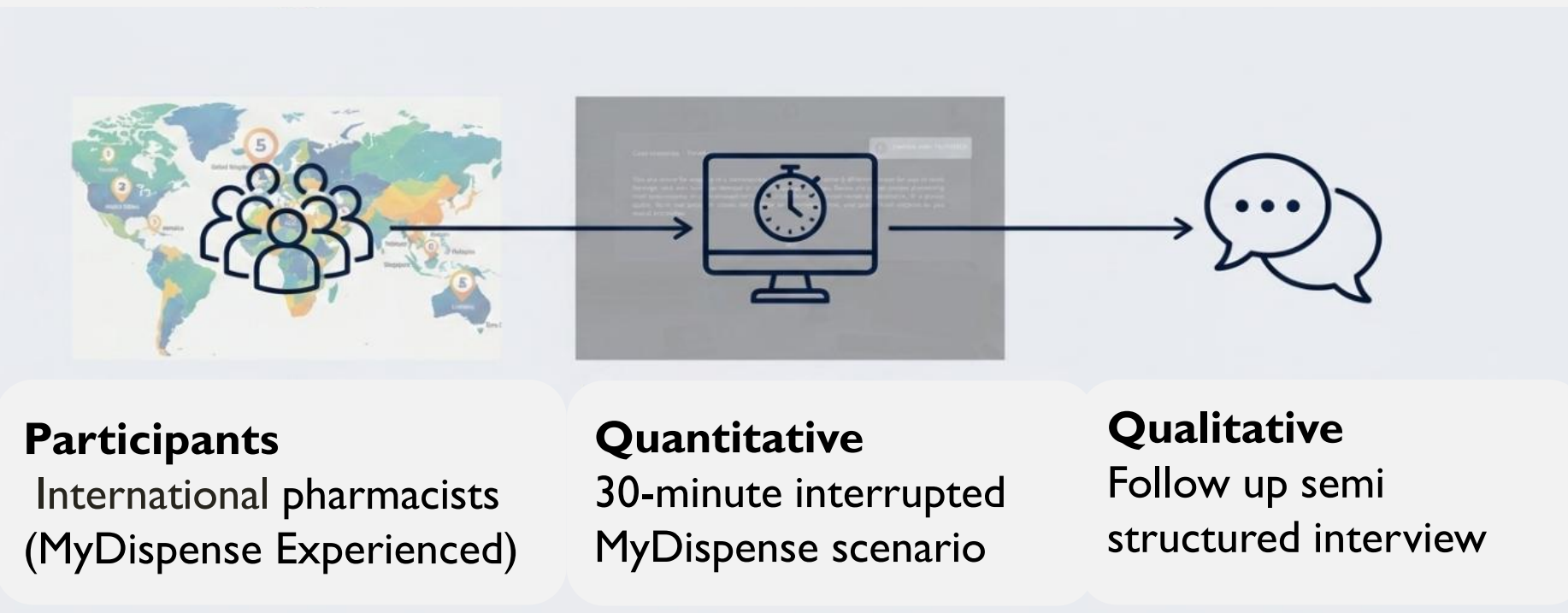
1. Rivera-Rodriguez AJ et al. Interruptions and distractions in healthcare: Review and reappraisal. *Qual Saf Health Care*. 2010;19(4):304-12.
2. Bixey JJ et al. A Concept Analysis of the Phenomenon Interruption. *Adv Nurs Sci*. 2007;30(1):26-42.

Objective

- ❖ This study examined how simulated interruptions affect pharmacists' task prioritisation and CDM skills
- ❖ Explored pharmacists' perspectives on the use of these scenarios in teaching and assessment

Methodology

- Convergent Mixed-Methods Approach¹
- Descriptive statistics and hybrid thematic analysis of interview transcripts²



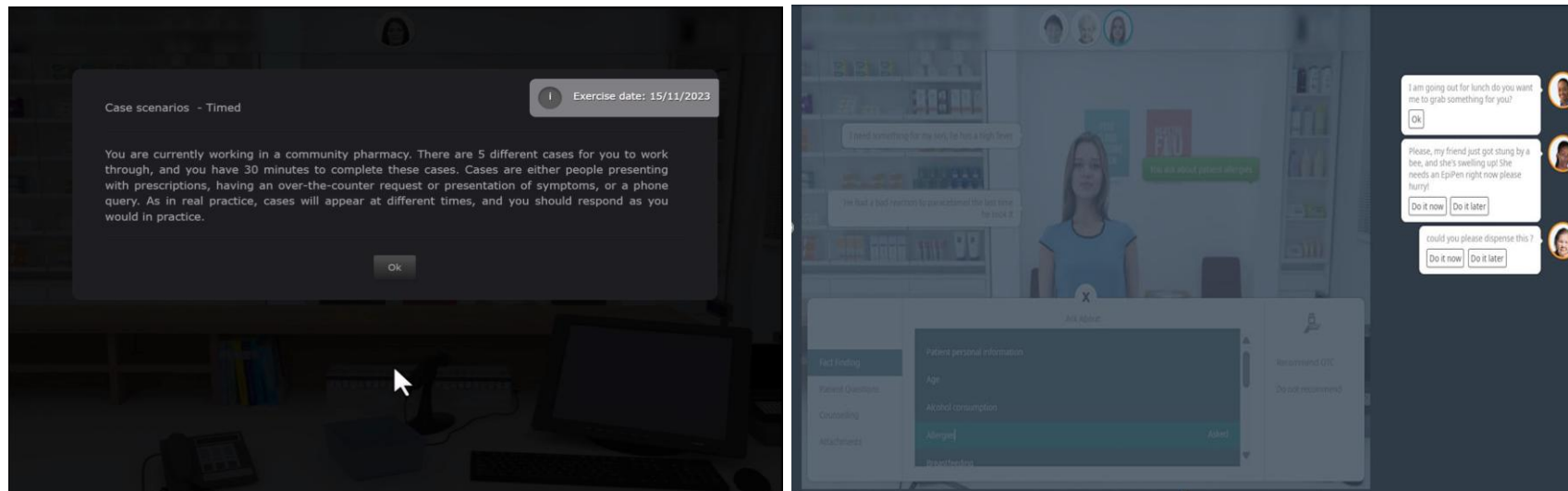
1. Creswell JW et al. *Designing and Conducting Mixed Methods Research*. 3rd ed. SAGE Publications; 2018.

2. Xu W et al . Applying Thematic Analysis to Education: A Hybrid Approach to Interpreting Data in Practitioner Research. *Int J Qual Methods*. 2020;19.

Interrupted Scenario

- Consisted of seven tasks with different priority levels
- Interruptions and distractions were triggered by time or task progression e.g.

[moving from dispensing to counselling](#)

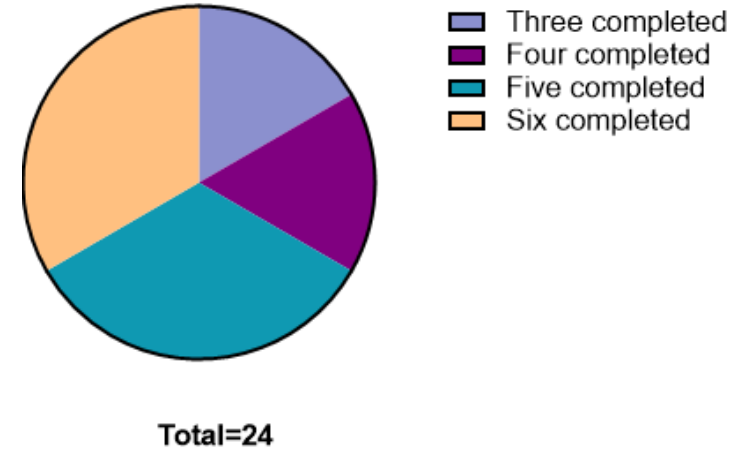


Results

Participant characteristics



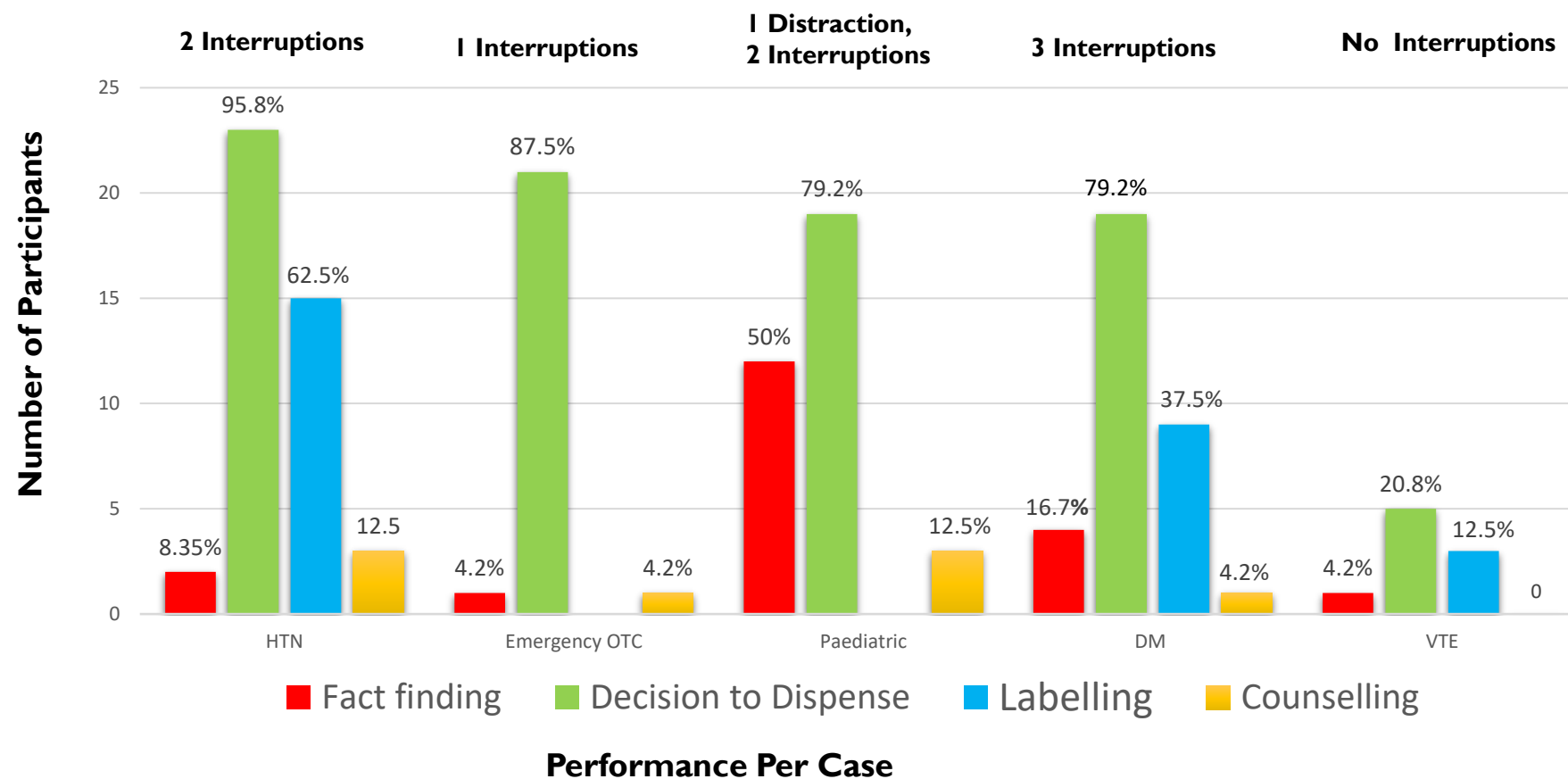
Scenario outcome



- Only 8 of 24 participants completed the scenario (33.3%)
- 16 of 24 Prioritised tasks incorrectly (66.7%)

Quantitative results

Overall performance across all cases



Diabetic Mellitus (DM), HTN: Hypertension, OTC: Over The Counter, VTE: Venous Thromboembolism

Qualitative Results



Realism of the Interrupted Scenario

- ✓ Similar to a real pharmacy interruption (I6)



Handling Interruptions in Simulation

- ✓ Different from real life, but a valuable learning experience (I0)



Cognitive Load In Simulation

- ✓ Cognitively more demanding than real practice (I3)

“It’s obviously a little less than what you find in real life because we’re in a controlled environment” (P7)
 “It’s obviously a little less than what you find in real life because we’re in a controlled environment” (P14)

Qualitative Results



Teaching Task Prioritisation

- ✓ Exposing them to interrupted scenarios (15)



Using Simulation to Develop Interruption Management Skills

- ✓ It is effective in preparing students for practice (13)



Suggestions to Improve the Scenario

- ✓ Modify cases and interruptions to enhance realism (10)

“Definitely because as a physician, I don’t like to deal with post-it notes, I’d rather have people giving me feedback. It’s easier if we speak with the patient rather than clicking things” (P21) and they agreed giving feedback platform differs “(P2) strategies ..., would be great” (P3)

Strengths and Limitations

+ Strengths

- International sample diversity
- Direct observation of performance
- Deeper insights

- Limitations

- Lack of face-to-face interactions in the online environment
- Absence of real time environmental pressure

Integrating interrupted scenarios into pharmacy education enhances preparedness for real-world practice



Mc
Ur

Thank you



Future-proofing Pharmacy Education: A programmatic assessment design approach for AI integration and authentic, integrated learning

Helen Enright, Snr Educational Designer
A.Prof Dan Malone, Pharmacy Course coordinator
A. Prof Betty Exintaris, Assoc Dean Learning & Teaching
Dr Nilushi Karunaratne, Senior Lecturer

Faculty of Pharmacy & Pharmaceutical Sciences
Monash University

Overview

1. Programmatic assessment and AI review (PAAIR)
2. Our context - Faculty of Pharmacy and Pharmaceutical Sciences
 - our approach
 - the benefits



PAAIR Programmatic Assessment and AI Review

- response to TEQSA requirements to ensure calibration of our courses for AI context
- University wide comprehensive review and programmatic adjustment of all learning outcomes and assessments across all courses to reshape and redefine assessment
- diverse assessments thoughtfully scaffolded across courses
- enhance AI security and ensure AI is strategically integrated into courses
- prepare students for rapidly changing AI world



Australian Government

Tertiary Education Quality and Standards Agency

Our programs and approach

- Bachelor of Pharmaceutical Sciences / Bachelor of Pharmaceutical Sciences (Advanced Honours)
- Masters of Pharmaceutical Sciences
- Bachelor of Pharmacy/ Hons / Master of Pharmacy program – placement based)
- Pharmacy theme unit clusters:
 - 6 Enabling science, 5 Inquiry, 6 Professional practice and 7 Comprehensive care units
- Our approach
 - Collaboration with faculty Education leaders
 - Bespoke workshops with course and unit teams



Learning outcome review

Stage one - review quality of learning outcomes

- clarity, measurability, AQF level



Stage two - coherence review – domain level

- do these ULOs capture all elements of the unit effectively?
- are they aligned with our new CLOs effectively?



Stage three - Gen AI inclusion

- Is this explicit? Implicit? AI mitigation?



Stage four - unit description review:

- review unit description for quality, language, clarity, engagement and consistency



Stage five - course holistic review:

- Do these learning outcomes align well with other units?
- is there a consistent approach

Unit assessment review

PRINCIPLES OF AUTHENTIC, EFFECTIVE ASSESSMENT DESIGN

- Assessment for learning and Assessment of learning, ensuring validity and learning
- How to promote authentic, engaging student focussed assessments
- Incorporating Graduate attributes into assessments

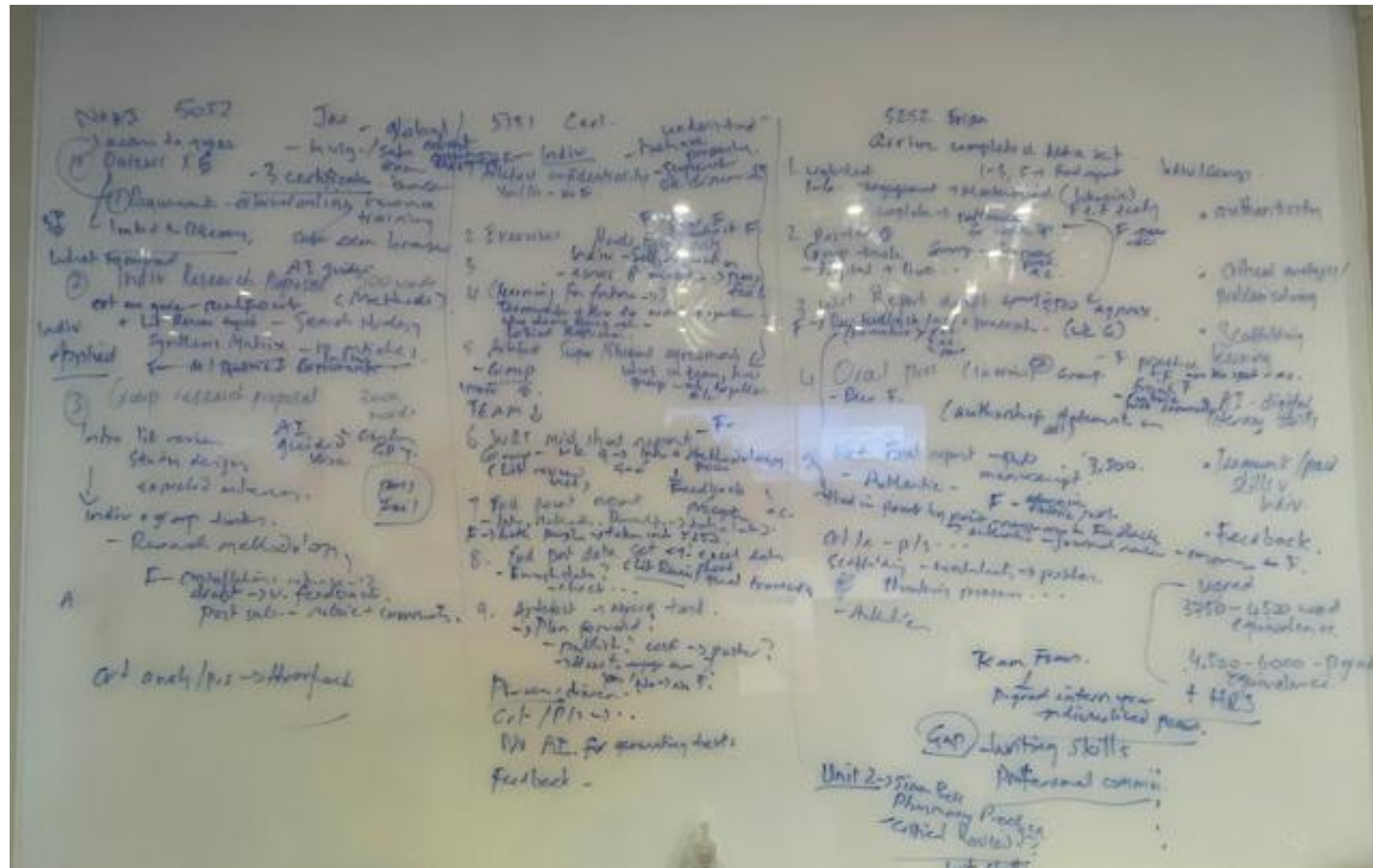
UNIT ASSESSMENT - REVIEWING OUR PRACTICE NARRATIVE DISCUSSION

- Stage 1 – Assessment task quality – purpose of assessment, authenticity, engagement, inclusive design, self reflection and peer learning, individual or group tasks
- Stage 2 – Assessment coherence - nesting and scaffolding assessments, weighting and workload of tasks, timing, strategic feedback and coherent assessment regime
- Stage 3 – AI integration - What level of AI use is designed? is student use of Gen AI assessed? AI as a marking tool, teaching of digital literacy skills
- Stage 4 - collaborative review and rewrite

PROGRAMMATIC THEMES

- What content themes are emerging? What skill themes are emerging?
- How is AI integrated across units?
- Design of educational framework to show cluster programmatic progression of learning

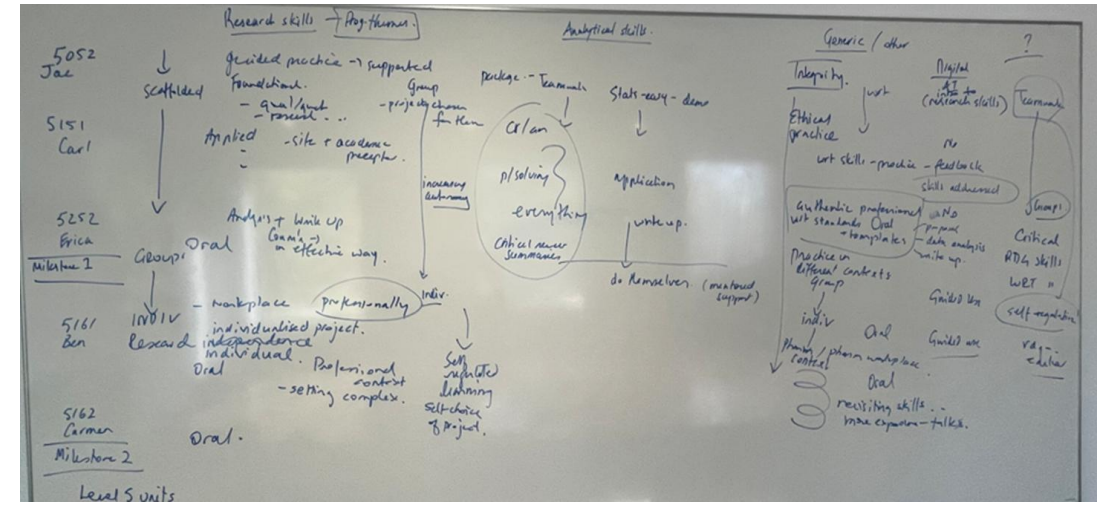
The narrative discussion



Sample Narrative summary of Inquiry unit - *Inquiry and innovation methods*

Assessment tasks and AI approach- NARRATIVE WHITEBOARD WORK	Assessment design approach - what is the purpose and why these tasks? How have you designed progression and scaffolding of learning Coherence of unit design - authenticity, scaffolding and building knowledge, Inclusivity - variety of tasks for engagement, individual, pair and group work- process of feedback	AI approach for each assessment task Guided use Unlimited use Not allowed Other?	Assessment Educational Framework Programmatic development eg: which assessments are foundational, applied practice or integration tasks BLOOMS level skills and OR A. Foundation eg: introductory concepts, knowledge/content based assessments B. Guided applied practice eg: applied learning - demonstration of knowledge tasks, applied individual or team assessments to scaffold learning C. Authentic integration eg: integration and culmination of skills to demonstrate consolidation of learning in assessments	Research skills (what broad inquiry research skills are developing across these units?) eg: qualitative and quantitative approaches and methodologies, research design, literature review structure and wrt skills -eg: search skills, proposal wrt skills, critical reading skills, critical evaluation, data analysis - statistical analysis etc	Analytical skills: (what analytical skills are developing and building across units?) eg: Content analysis- eg: Critical analysis demonstrated in critical summaries, critical review data analysis Teamwork analysis : team work function and contribution of members problem solving and negotiation	Generic skills (what critical communication, Gen AI, and academic literacy skills are developing across units?) Communication - Academic/scientific writing skills (eg: summary writing, paraphrasing and synthesis, creating coherent arguments report writing, research summaries/ proposal, literature review Visual communication - data clearly expressed visually - tables, graphs, stats Communication - oral skills eg: oral presentation, oral defense - VIVAs, podcasts, OSCEs) Teamwork - Assessed and not assessed
1. Quizzes x 6 Linked to discovery - Incl 3 certificates - required online resource training (Invigilated - safe exam browser) Introduction to research: Quiz (competency hurdle) Study design: Quiz (competency hurdle) Scientific writing: Quiz (competency hurdle) ICH Good Clinical Practice E6 (R2): Short course (competency hurdle) Literature review: Quiz (competency hurdle) Statistics: Extended Quiz (competency hurdle) NO AI 2. Individual research proposal Extension one quiz - scientific writing : Written (competency hurdle) 500 words literature informed methodology - Lit review topic search strategy Synthesis matrix - 10 articles in synthesis table AI GUIDED USE 3. Group research proposal Written (competency hurdle) 3000 words full project proposal study design and expected outcomes	Quizzes designed to focus on content knowledge - the what - eg: what is a literature review etc - first time exposure to content areas for many ss. Also meet certificate requirements. Assessment of learning focus Provides foundational background for following authentic tasks. Authentic practice tasks - Assessment for learning - individual research proposal, search engine process and matrix of literature task. Scaffolded skills to major group research proposal Nested assessment design approach: Individual and teamworks skills practised. Authentic range of tasks - steps students through the process of literature search and proposal design. Feedback approach: academic to learner focussed - designed to adopt feedback in draft form and apply to learning Ass 1 - global cohort feedback - incl misconceptions Ass 2 - rubric and individualised comments Ass 3 - consultation session week 10-12 draft targeted feedback Post submission rubric and comments Provides foundation for next unit - 5151	AI - integrated via explicit Custom AI tool built for proposal writing assessment AI & Generative AI tools may be used in GUIDED ways within assessment 2 and 3. AI digital literacy skills development designed into unit. AI mitigated task in assessment 1	Critical analysis and problem solving throughout Assessment 1 - foundational knowledge (understand, apply) Assessment 2 - active learning and demonstration of applying theory to practice apply, analysis, evaluate Assessment 3 - culmination of skills large integrated task (apply, analyse, evaluate , create)	Foundational research skills for practice Focus - Introduction to research: Qualitative and quantitative approaches to research Study design Scientific writing ICH Good Clinical Practice Introduction to the Literature review Research strategies and synthesis matrix design Introduction to Statistics Individual research proposal Group research proposal Pedagogical approach: Foundational guided practice to introduce concepts and key research knowledge via individual and group tasks. Facilitator as structured guide.	Critical analysis: Introduction to critical review, critical summary, evaluation of literature, study design and methodology Critical analysis in academic context as academic learner Data analysis: Introduction to statistics Teamwork analysis Analysis of team member roles, contribution and impact problem solving in teams	Communication skills: Introduction to academic literacy for research, Introduction to writing skills, including the literature review, scientific writing, communicating data and study design in research proposal Critical reflection skills: Introduction to critical reflection and reflecting on learning individually and as a team. AI digital literacy skills: Introduction to AI digital literacy and using chat bot to support learning, Critical evaluation of AI texts and explicit use of AI designed into unit and assessments to build AI literacy skills. Teamwork and group collaboration skills: Introduction to research teamwork through research group work and roles and responsibilities evaluation. sets up group work for following units which is primarily group work focussed. Self regulated learning: Introduction to self regulation tasks that reflect on individual learning, growth and development. Professional skills: Establishes the critical role of research in underpinning pharmacy practice. The importance of evidence based practice in pharmacy decisionmaking is introduced and establishment of clear alignment with the APC Pharmacy capability framework.

The programmatic lens – key questions



What is the student's journey?

What content/skills are we assessing? Product and process?

How are we scaffolding content/skills knowledge across units?

How are we mitigating AI risk? whilst building AI digital literacy skills?

How are we incorporating feedback for learning across units?

How are we building critical analysis and problem solving skills?

How are we assessing and building other generic skills – eg teamwork, communication, critical reflection – is this explicit or implicit?

Sample – Inquiry units - a programmatic approach to Assessment design

Programmatic theme
development

1. Inquiry &
Innovations
methods (6 cp)
3rd year

Foundational research skills
for practice

2. Inquiry &
Innovation
Projects
(12 cp) 4th year

Applied research skills for
practice

3. Inquiry &
Innovation
Communication
(6 cp) 4th year

Communicating research
skills in practice

4. Foundation
Practice 1
(12 cp) 5th year

Enacting research in
workplace contexts – sem 1

5. Foundation
Practice 2
(12 cp) 5th year

Enacting research in
workplace contexts – sem 2

Sample – Inquiry units - a programmatic approach to Assessment design

Programmatic theme development

Content knowledge development: the product - The WHAT

1. Inquiry & Innovations methods

Foundational research skills for practice

Introduction to research: qual & quant methods, study design, scientific writing, statistics and literature reviews

2. Inquiry & Innovation Projects

Applied research skills for practice

Confidentiality agreements, data collection & analysis, report and literature review writing

3. Inquiry & Innovation Communication

Communicating research skills in practice

Communication of research: journal manuscript style writing, digital poster, oral presentation

4. Foundation Practice 1

Enacting research in workplace contexts – sem 1

Writing research proposal in authentic context with complex workplace setting including drafts and final proposal draft

5. Foundation Practice 2

Enacting research in workplace contexts – sem 2

Digital poster based on workplace project, 3 minute lightening talk and mock job interviews

Sample – Inquiry units - a programmatic approach to Assessment design

Programmatic theme development

Content knowledge development: the product - The WHAT

Research skill development: the process - the HOW

1. Inquiry & Innovations methods

Foundational research skills for practice

Introduction to research: qual & quant methods, study design, scientific writing, statistics and literature reviews

Individual concept tasks, individual research proposal & group research proposal

2. Inquiry & Innovation Projects

Applied research skills for practice

Confidentiality agreements, data collection & analysis, report and literature review writing

Reflection tasks and learning agreements, mid short report incl brief lit review, group end report and data set matrix

3. Inquiry & Innovation Communication

Communicating research skills in practice

Communication of research: journal manuscript style writing, digital poster, oral presentation

Research synthesis task, group digital poster, group journal manuscript draft and final report, group oral presentation

4. Foundation Practice 1

Enacting research in workplace contexts – sem 1

Writing research proposal in authentic context with complex workplace setting including drafts and final proposal draft

Workplace learning plan and reflective practice and case – based tasks, delivery of Education presentation, writing reflections and workplace proposal draft

5. Foundation Practice 2

Enacting research in workplace contexts – sem 2

Digital poster based on workplace project, 3 minute lightening talk and mock job interviews

Workplace learning plan and reflective practice and case – based tasks, digital poster and 3 minute lightning talk, ATLAS AI interview and feedback

The programmatic lens

Academic meta skills



Critical Analysis

Gen AI skills
AI use and
mitigation

Communication
skills
Oral & written

Ethical
practice

Teamwork &
group
collaboration

Self
regulated
learning

Professionalism

Critical
reflection



1. Inquiry &
Innovations
methods

2. Inquiry &
Innovation
Projects

3. Inquiry &
Innovation
Communication

4. Foundation
Practice 1

5. Foundation
Practice 2

The programmatic lens

Academic meta skills



Critical Analysis

Gen AI skills
AI use and
mitigation

Communication
skills
Oral & written

Ethical
practice

Teamwork &
group
collaboration

Self
regulated
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Professionalism

Critical
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1. Inquiry &
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methods

2. Inquiry &
Innovation
Projects

3. Inquiry &
Innovation
Communication

4. Foundation
Practice 1

5. Foundation
Practice 2



Feedback for learning:
self, peer, teacher, drafts and
nested tasks

Pedagogy:

authentic practice, active learning,
nested drafts of assessments,
feedback, critical reflection,
assessment for learning focus

Benefits of PAAIR

- Critically reflect on big picture and granular level
- Articulated and mapped a whole range of skills – not just assessment types – holistic view of student learning
- Learning outcomes now make sense across units and better aligned to new Course Learning Outcomes (CLOs).
- Assessment for learning and assessment of learning - Integration of assessment into the learning process, rather than a separate activity.
- Robust discussions about Gen AI and strategic thinking about AI integration, mitigation and AI literacy skill development
- Allowing educators to tell the story of their assessment regime – what, how and why is critical



The background features a gradient from dark teal to light blue. Several translucent spheres of varying sizes are scattered across the scene. On the right side, a large, white, stylized letter 'W' is partially visible, extending from the top to the bottom of the frame.

Questions and comments?



MONASH
University

Identifying core concepts of pharmacotherapy for pharmacy education: An international study

Alison Ubong Etukakpan

PhD Candidate

Pharmacy and Pharmaceutical Science Education, Monash University

Supervisors

Prof Paul White, Monash University

Dr Megan Waldhuber, Monash University

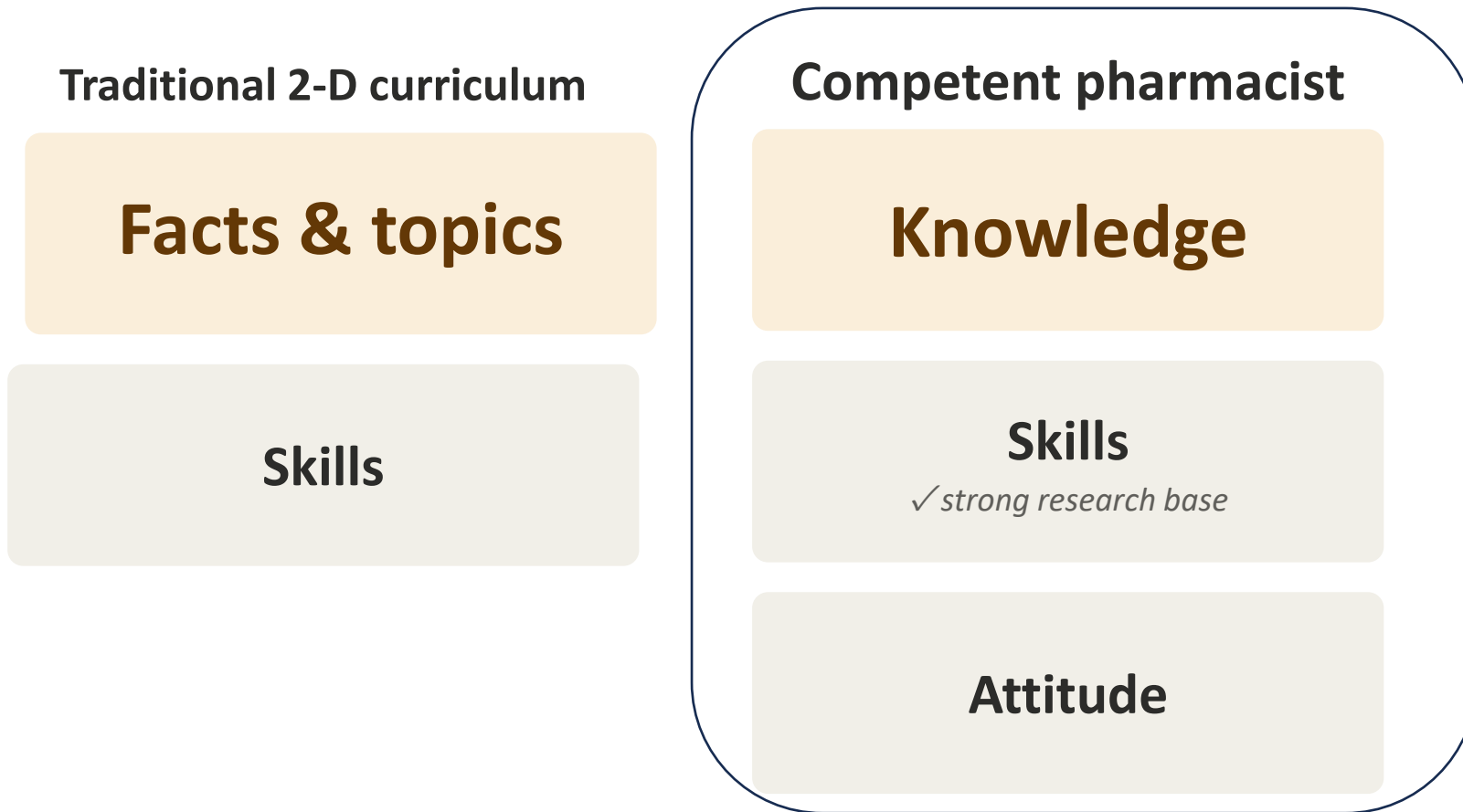
Prof Kristin Janke, University of Minnesota

I wish to acknowledge the people of the Kulin Nations, on whose land this research is conducted. I pay my respects to their Elders, past and present.



Background

Knowledge aspects for pharmacy competency



Background

Why deepen knowledge aspect for pharmacy competence



Curricula overload¹



Content-heavy resources²

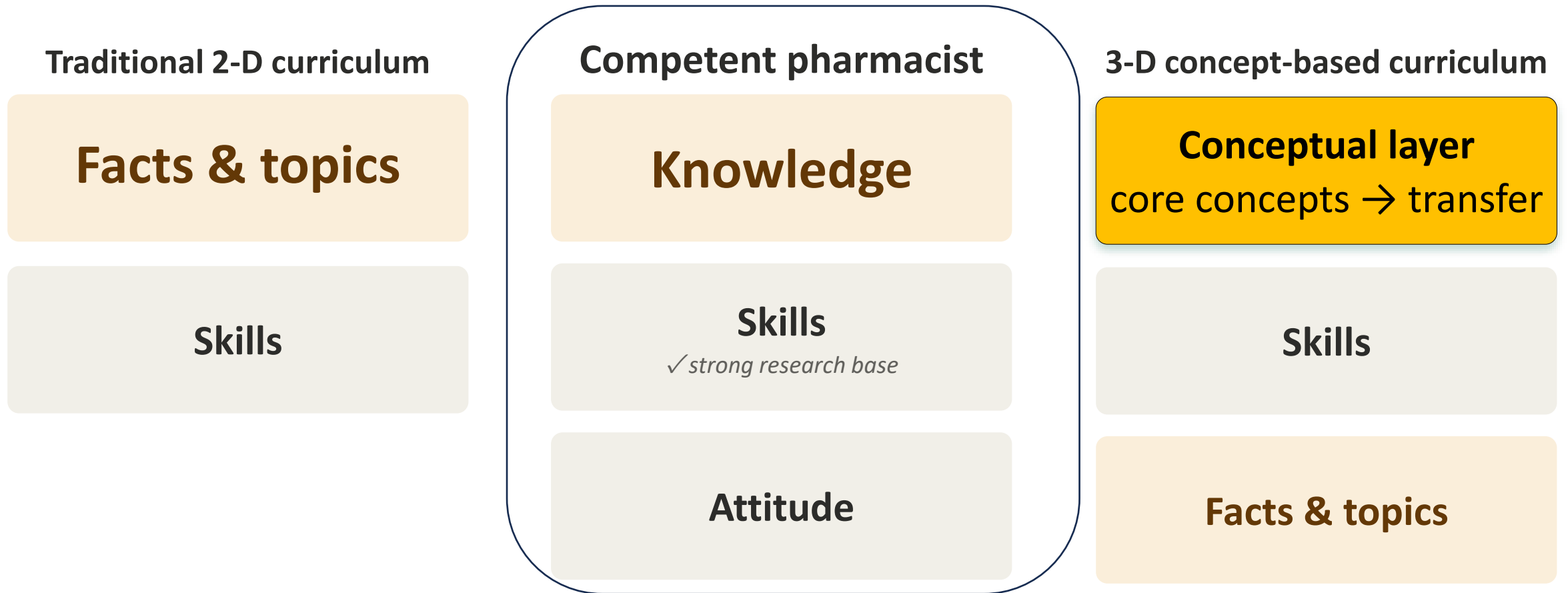


Students' misconceptions³

1. Kelley et al., (2023) American journal of pharmaceutical education
2. Kolanczyk, et al., (2024) J Am Coll Clin Pharm
3. Kelly-Laubscher et al., (2025), European Journal of Pharmacology

Background

A conceptual layer for the knowledge aspect of pharmacy competency



Why the conceptual layer matters: Developing deep, transferable understanding and higher-order thinking, knowledge that carries to **new patients, new medications, and problems.**

Research Aim

Identify a comprehensive and consensus-based list of pharmacotherapy core concepts for pharmacy education

What are core concepts?

Ideas that **experts agree** are essential for all students to learn, remember, understand, and apply.

“Coreness” criteria

- Fundamental
- Useful
- Enduring
- Complex
- Challenging

Examples of core concepts

Nursing



Caring

Physiology



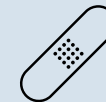
Cell membrane

Dietetics



Nutritional status

Pharmacology



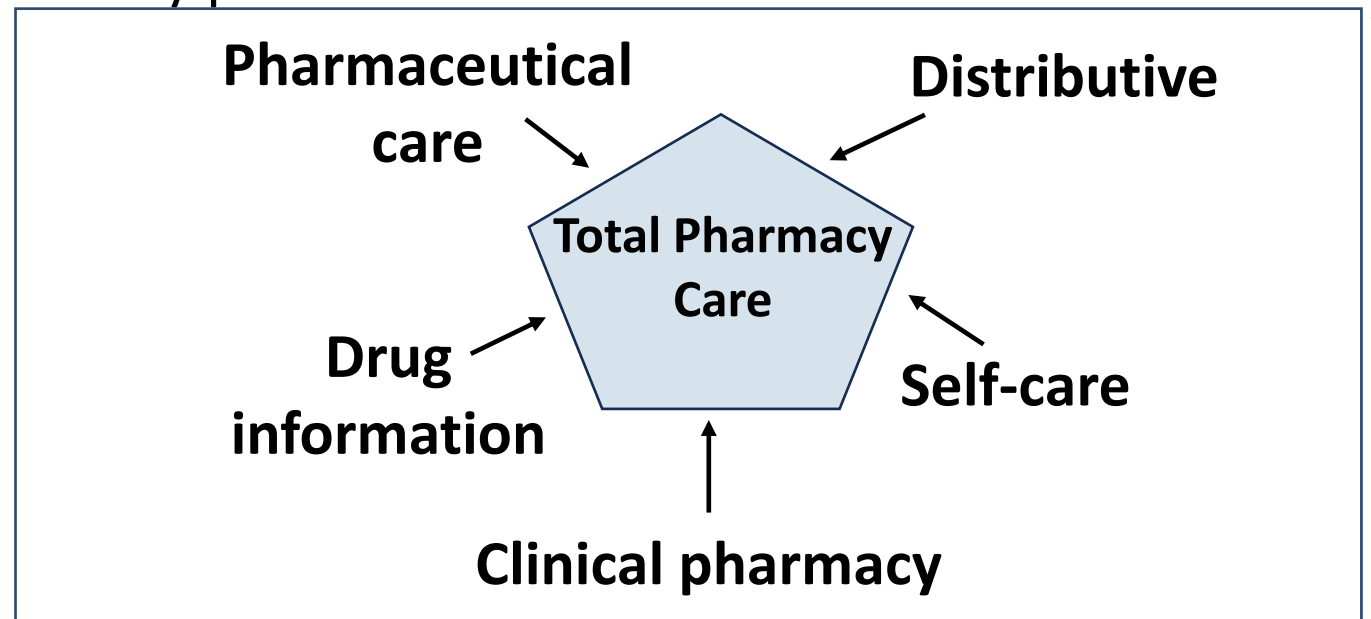
Drug elimination

Method

Considerations for an international study

Pharmacotherapy

- The **use of medications** to treat, prevent, or diagnose diseases¹
- **Variations** in pharmacy practice models



Study design

- A biphasic mixed method
 - Phase 1 focuses on a comprehensive list
 - Phase 2 focuses on a consensus list

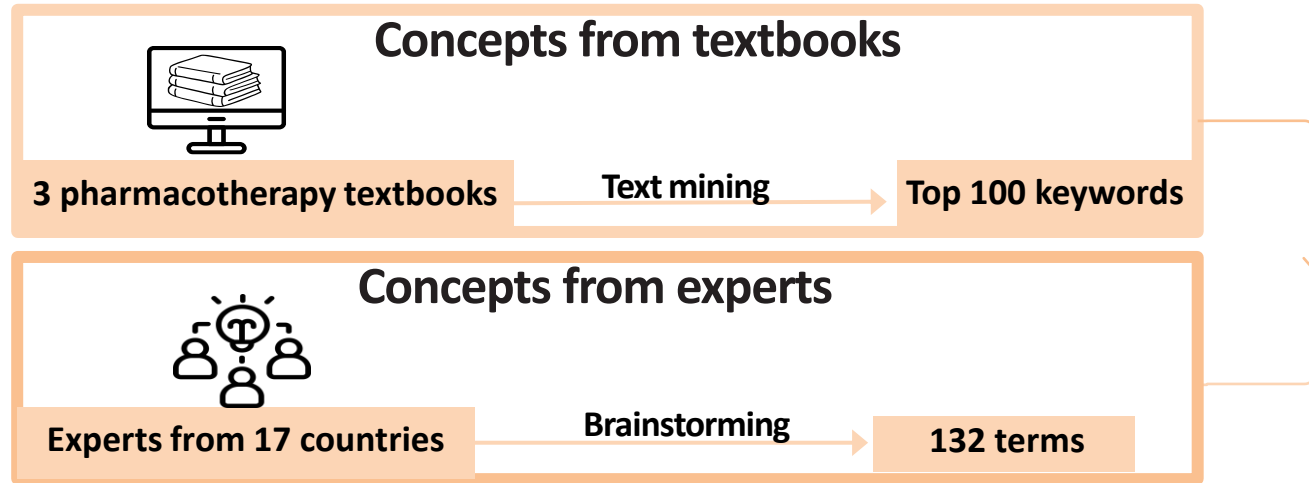
¹ ACCP. (2000). Pharmacotherapy

² Nimmo CM, Holland RW (1999). *American Journal of Health-System Pharmacy*

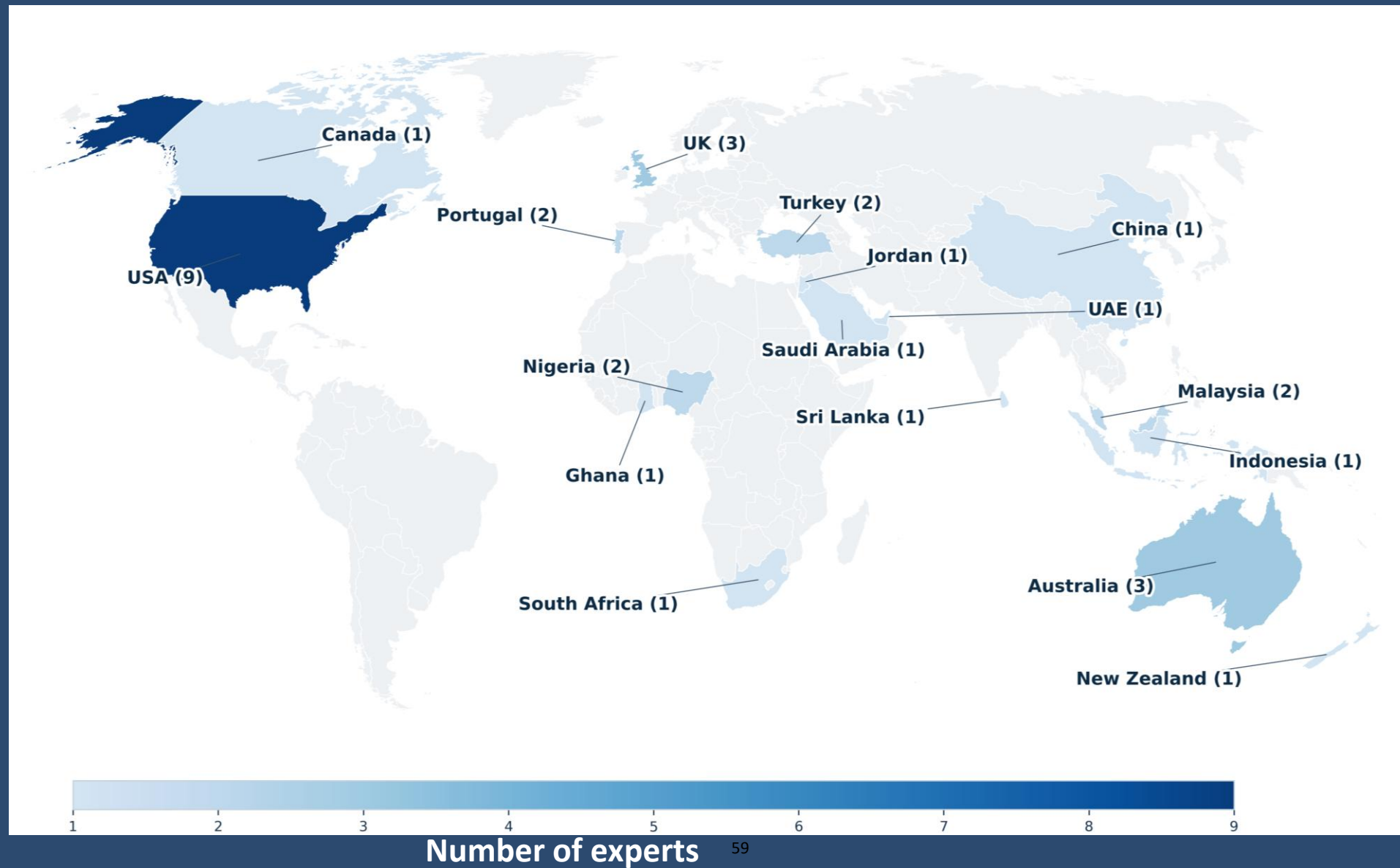
Method

Phase 1

Phase 1: Qualitative multimethod to develop a list of potential core concepts



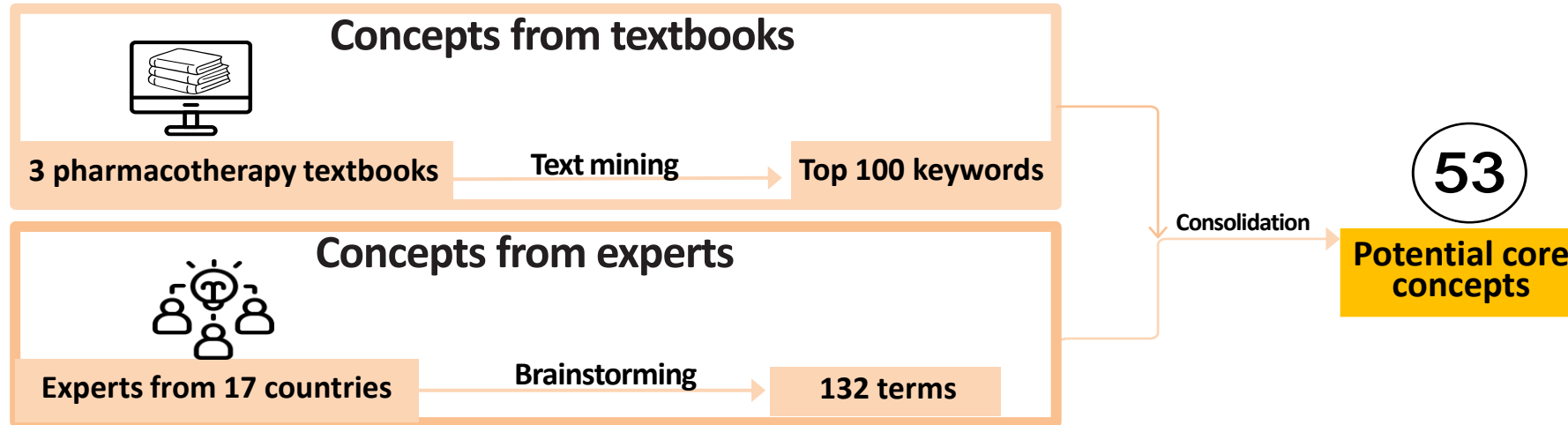
33 pharmacotherapy educators from 17 countries



Method

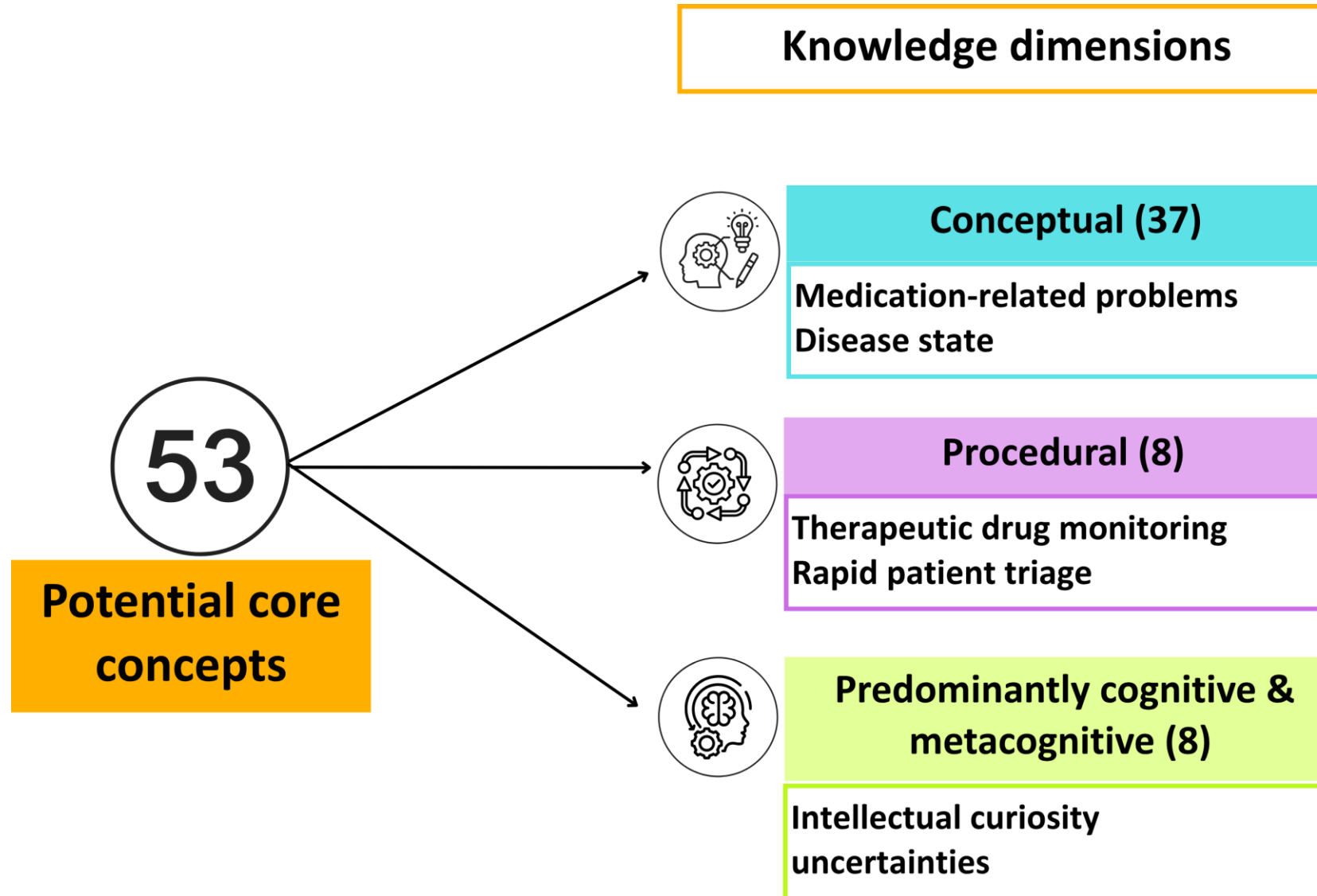
Phase 1

Phase 1: Qualitative multimethod to develop a list of potential core concepts



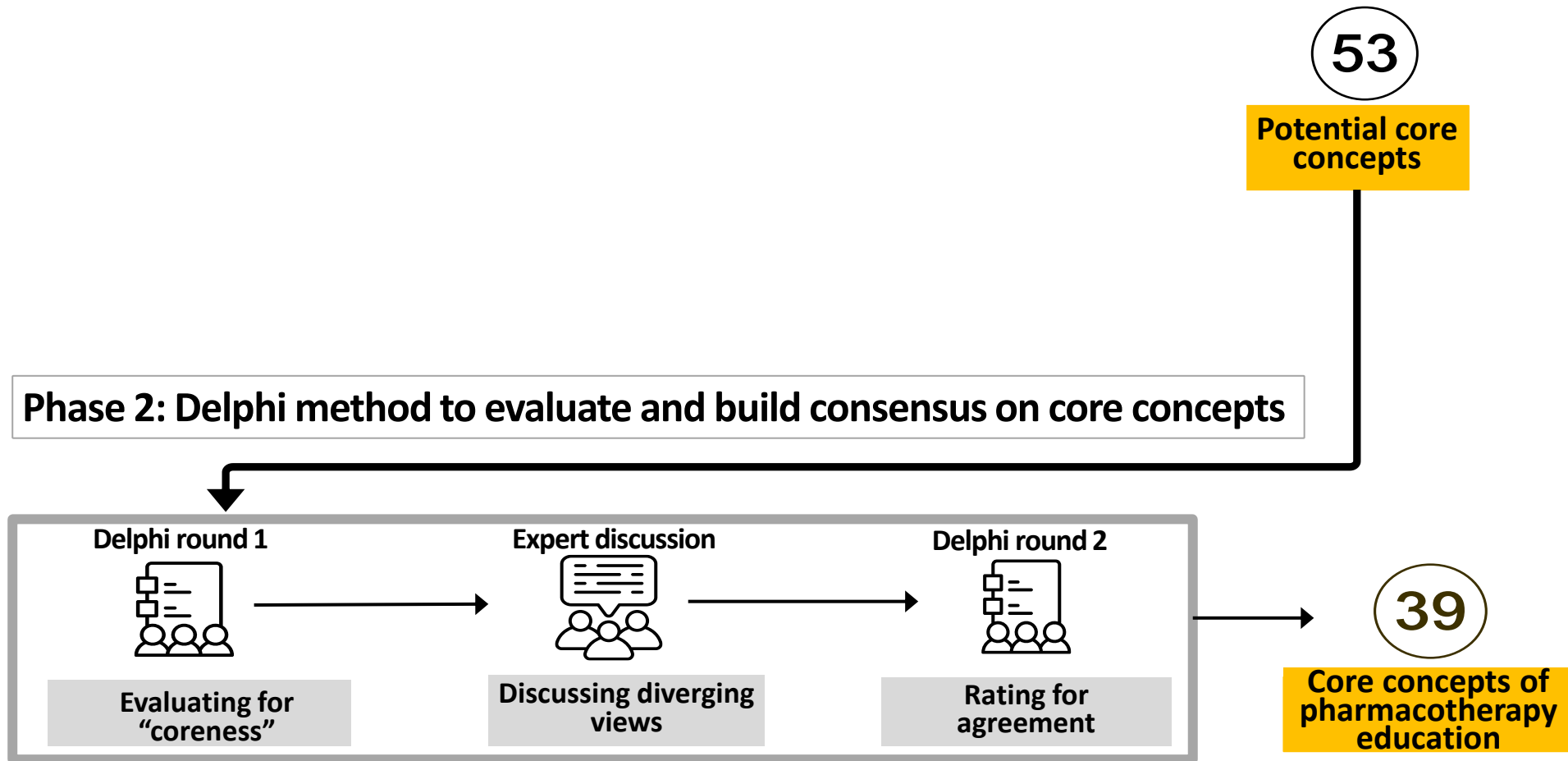
Phase 1 key finding

53 potential core concepts organized into 3 knowledge dimensions



Method

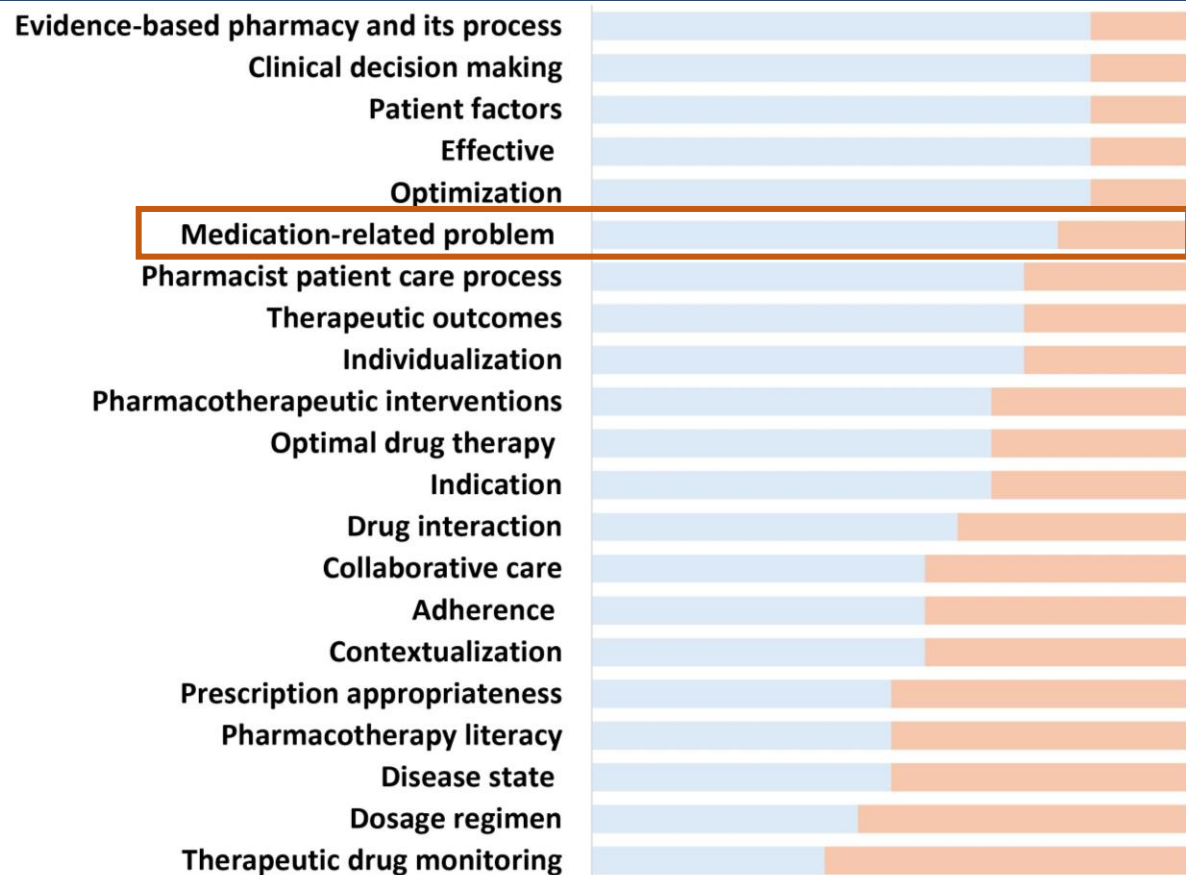
Phase 2



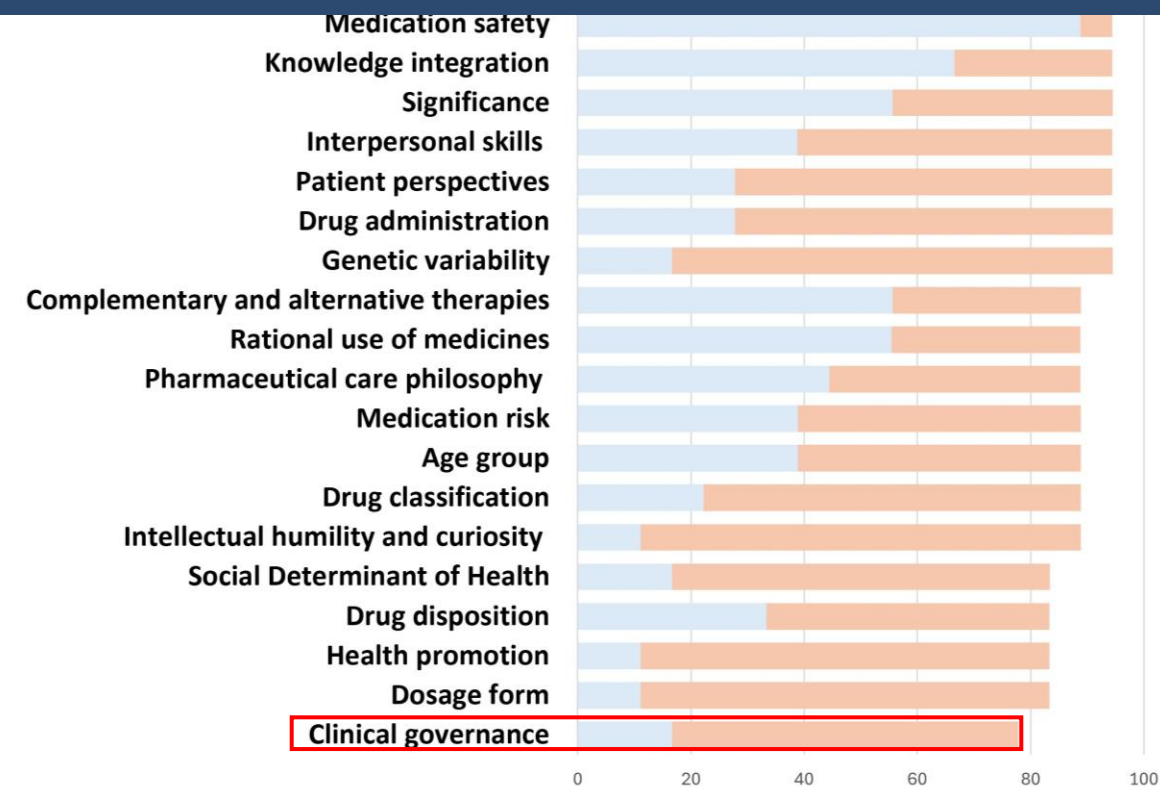
Phase 2 Key finding

39 core concepts met > 80% agreements by the Delphi panel

21 Core concepts with 100% combined agreement



18 Core concepts with some disagreement



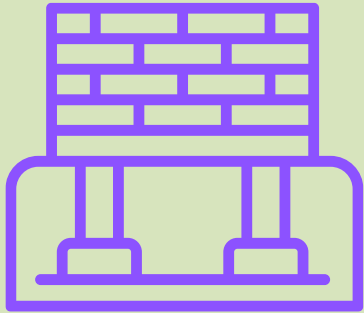
1 potential core concept with 78% agreement dropped

Strongly agree Agree

Phase 2 Key findings

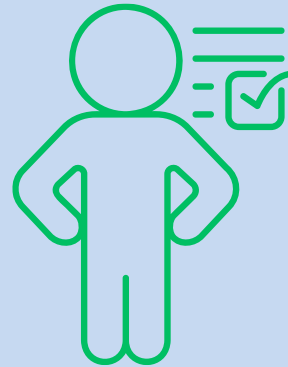
The 39 core concepts are organized into 3 clusters of big ideas

Cluster one Foundational ideas (4)



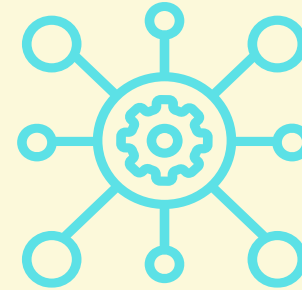
Contextualisation
Individualisation
Significance

Cluster two Individual-level ideas (25)



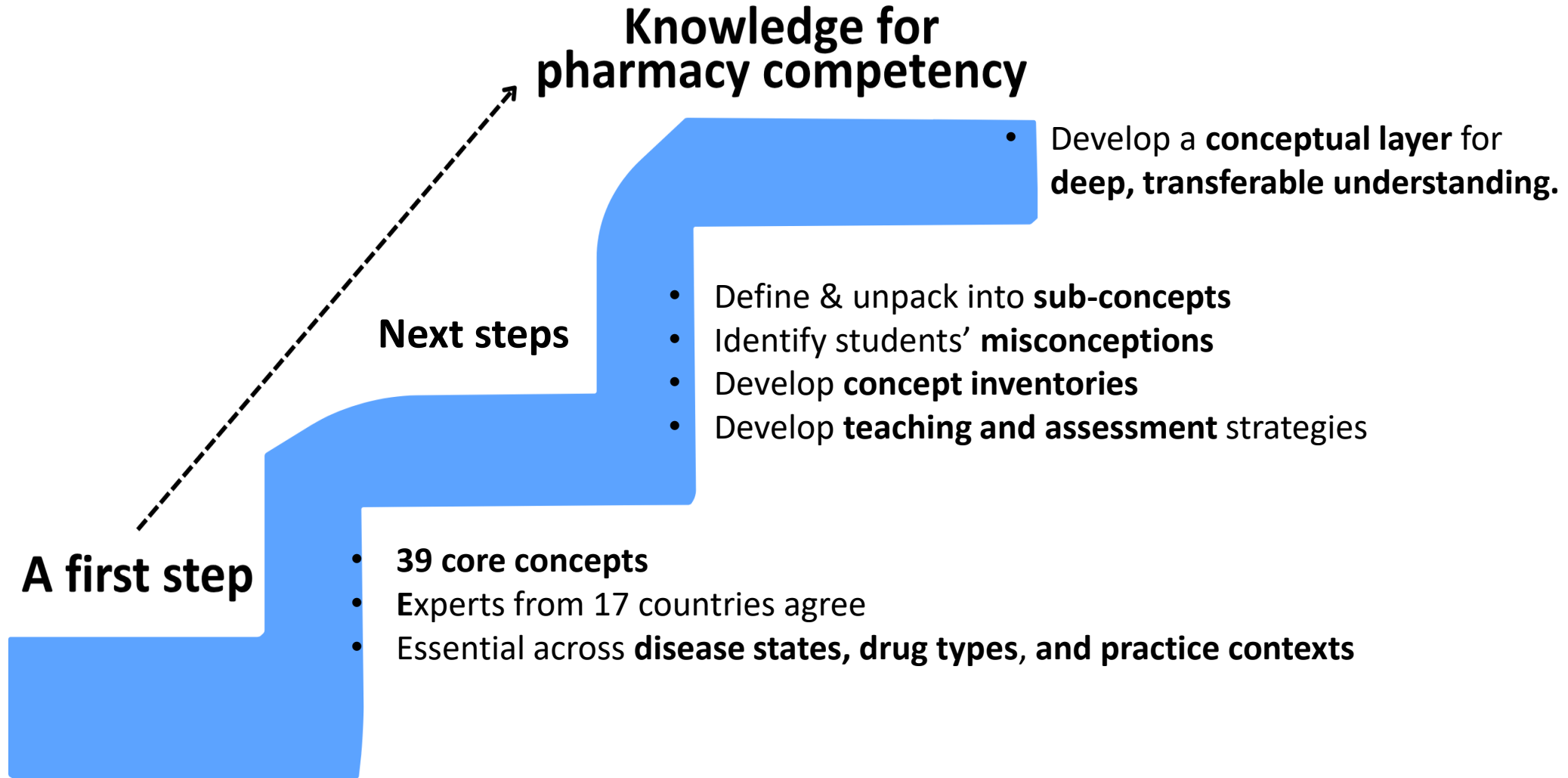
Adherence
Therapeutic outcomes
Medication related problems

Cluster three Systems & professional level ideas (11)



Collaborative care
Health promotion
Clinical decision making

Conclusion



Acknowledgement

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Paul White
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Turkey
Turkey
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United Kingdom
United Kingdom
United Kingdom
USA
USA
USA
USA
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USA
USA

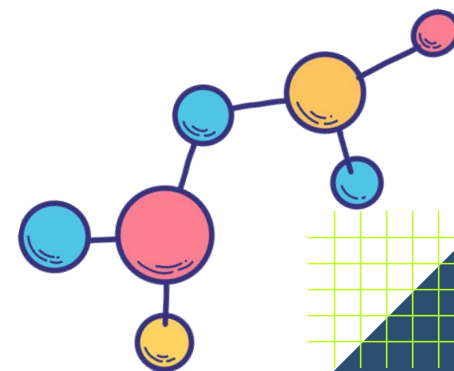


Alison.etukakpan@monash.edu

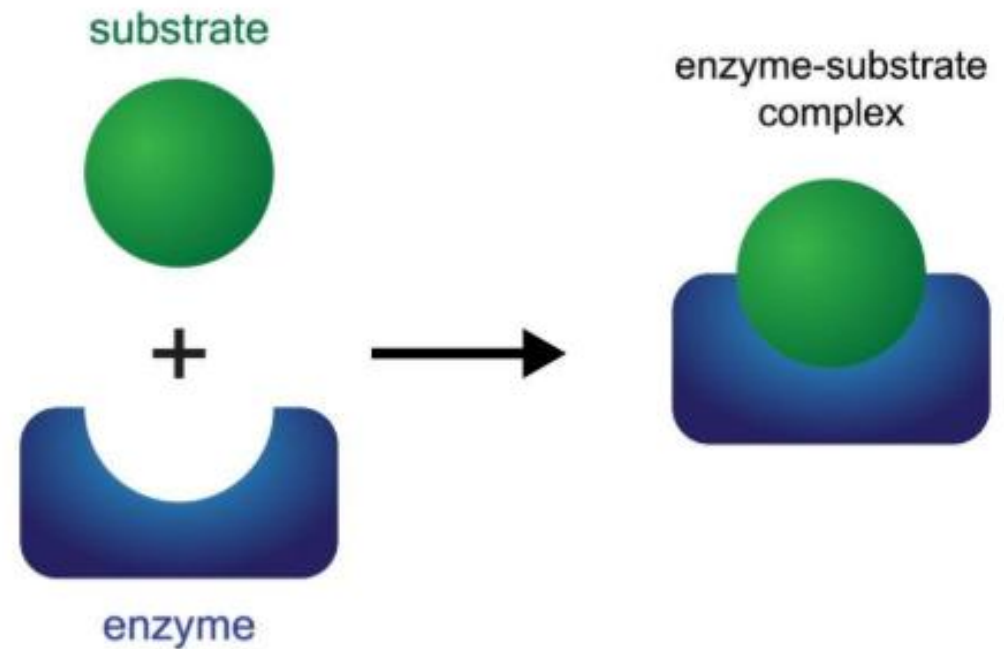
Beyond the Lecture: Game-Based Learning as a Catalyst for Transformative Pharmacy Education

Dr. Lim Han Yin (Angel)

School of Pharmacy, Monash University Malaysia



From Molecules to Medicine: Why Chemistry Underpins Pharmacy Learning



If a pharmacist only knows that a drug relieves pain, is that sufficient for a pharmacist to predict how it works and explain to a patient?

Why Chemistry Underpins Drug Action

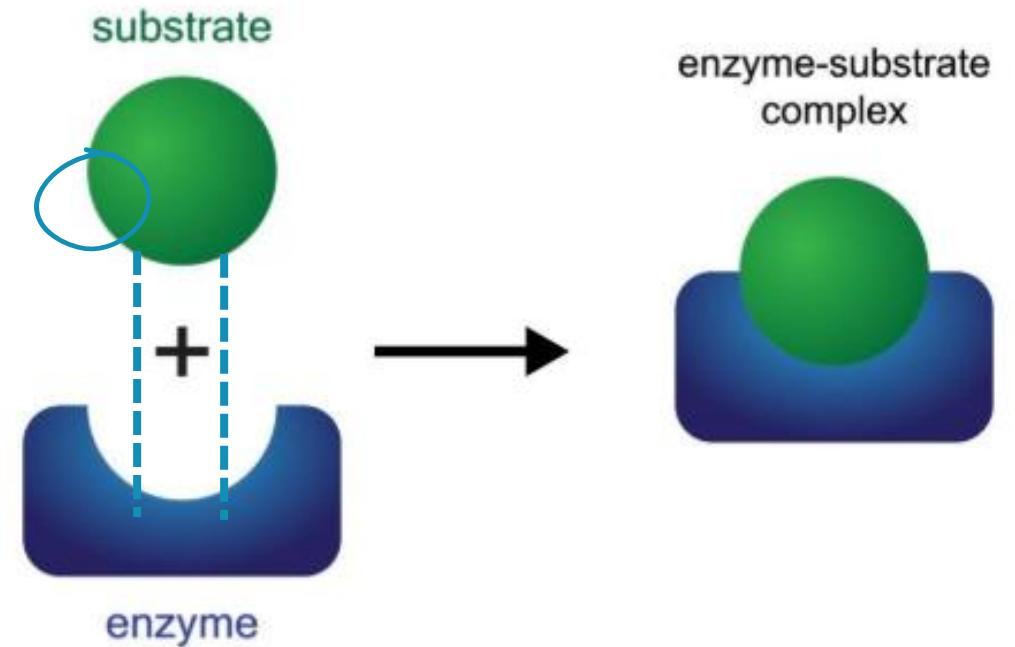
Functional groups → binding specificity

Ionisation (pKa) → solubility & absorption

Hydrogen bonding /interactions → binding strength

Molecular geometry (sp^2/sp^3) → fit and orientation

Physicochemical properties → bioavailability

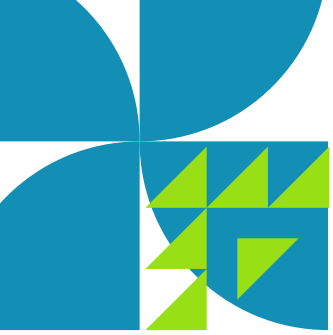


Foundational Gaps and Declining Performance Across Cognitive Levels in Learning Chemistry

Cognitive Level			
Domain	Simple	Applied	Novel
Molecular foundation	0.385274	0.344912	0.191781
Chemical properties	0.76994	0.744292	0.29521
Dosage forms and application	0.875	0.80137	0.815068

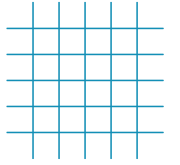
*Data: PHR1021 Pharmaceutical Chemistry (Year 1), Monash Malaysia campus; two MCQ assessments (2025 cohort). Items mapped to domains and cognitive levels.

- **Clear decline in performance from Simple → Apply → Novel questions**
- **Applied and novel questions consistently show the weakest performance across all domains**
- **Pattern persists across domains despite differences in content sequencing, suggesting a broader learning limitation beyond topic order**



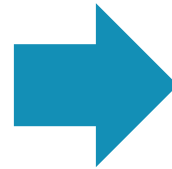
From Pattern to Problem:

Limited Cognitive Flexibility in Learning



Problem synthesis

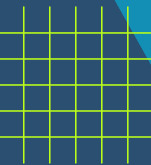
- Consistent decline in performance from simple to novel tasks
- Difficulty applying knowledge in unfamiliar contexts
- Pattern observed across all domains



Interpretation

- Indicates limited ability to retrieve and adapt prior knowledge flexibly
- Suggests underdeveloped cognitive flexibility in problem-solving
- Learning is fragmented rather than transferable across contexts

These findings suggest the need for an intervention that strengthens students' ability to adapt and apply knowledge across varying problem contexts.





A Game-Based Learning Environment for Flexible Thinking

Key Design Features

Multi-Level Question Cards

- Progress from simple to higher-order thinking

Flexibility Cards

- Require students to change perspective, reasoning approach, or response mode

Hazard Cards

- Introduce unexpected challenges and changing conditions

Collaborative Gameplay

- Encourages discussion and peer learning

A structured learning tool integrating pharmaceutical chemistry concepts into game-based problem-solving.



Design Rationale: Linking Game Mechanics to Intended Learning Processes

Game Mechanic	Targeted Learning Process	Related Construct Evaluated
• Multi-level Question Cards • Flexibility and Hazard Cards • Group Discussion and Peer Challenge • Repeated Gameplay Cycles	• Retrieval, application, and transfer of knowledge • Perspective shifting and alternative reasoning approaches • Adapting responses to changing conditions • Collaborative reasoning and explanation	• Conceptual Integration (CI) • Cognitive Flexibility (CF) • Collaboration (CO) • Engagement (EN)

The game was intentionally designed to create opportunities for flexible thinking, conceptual integration, collaboration and engagement.

Quantitative Outcomes

Construct	Pre Mean +/- SD	Post Mean +/- SD	Cohen's d	p-value
Constructive Flexibility (CF)	3.303 +/- 0.903	3.962 +/- 0.932	0.718	p < .001
Constructive Integration (CI)	3.171 +/- 0.851	3.971 +/- 0.978	0.873	p < .001
Collaboration (CO)	3.286 +/- 0.995	4.029 +/- 0.978	0.753	p < .001
Engagement (EN)	N/A	4.186 +/- 0.952	N/A	N/A

All constructs were measured using a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree).

- **All three constructs showed positive pre–post improvement**
- **High post-activity engagement reported by participants**
- **Effect sizes varied across constructs ranging from 0.718 to 0.873, with conceptual integration demonstrating the largest effect size, followed by collaboration and cognitive flexibility**
- **Findings align with the intended learning mechanisms embedded within the game**

Beyond the Numbers – Evidence from Practice

This slide brings together findings from facilitator observations, scoring sheets and student interviews:

1. Learning through peer collaboration

- Students actively discussed, explained, and guided each other
- Facilitators observed frequent peer-to-peer clarification during gameplay
- Quote from interview: “friends guide and hint in some direction”

2. Cognitive flexibility in action

- Students shifted strategies and approaches when faced with new question contexts
- Observed adjustment of thinking under flexibility-based challenges
- Quote from interview: “I change the method of approaching the question”

3. Applied understanding through gameplay

- Concepts such as pH, pKa, solubility were jointly worked out during tasks
- Students reported clearer understanding through application
- “we... share answers and work it out together”

4. Engagement under structured challenge

- High participation and sustained engagement observed by facilitators
- Students described the activity as fun, interactive, and motivating
- “fun, interactive learning activity”



Conclusion: Game-Based Learning as a Catalyst for Transformative Pharmacy Education



The learning process differed from traditional structured instruction:

Not instructor-led explanation or demonstration → but student-driven decision-making, negotiation, and adaptive problem-solving within gameplay

What the evidence shows

- Quantitative results: demonstrated measurable improvement in learning outcomes
- Qualitative + observation data: showed consistent patterns of:
 - Peer-to-peer discussion and co-construction of answers
 - Real-time adaptation of thinking strategies under game conditions
 - Integration of multiple chemistry concepts during problem-solving



Overall conclusion

This study provides converging evidence that a chemistry board game supported meaningful learning through active, student-driven cognitive engagement, beyond traditional instruction.



Thank You

Trajectories of **logical**, **emotional** and **moral** communication themes across repeated student GenAI-simulated patient interactions



Presenter Amna Mazeh *Mpharm, PhD*

Co-authors Emily Stokes · Angelina Lim · Joyce Chen · David Wei Dai · Joel Moore

Background: what prompted this work



Contents lists available at [ScienceDirect](#)

Currents in Pharmacy Teaching and Learning

journal homepage: www.sciencedirect.com/journal/currents-in-pharmacy-teaching-and-learning



Research Paper

Using an educator-guided generative artificial intelligence (GenAI) tool for developing communication skills in undergraduate pharmacy students

Angelina Lim ^{a,b,*} , Emily Stokes ^{a,c}, Li-Ling Yeap ^d, Amna C. Mazeh ^e,
Ethan Kreutzer ^a, Joel Moore ^e



| Aims

1

To characterise how students' clinical communication develops across repeated ATLAS practice attempts

2

To examine within-platform learning across three dimensions of communication: logical, emotional, and moral

3

To identify whether learning trajectories differ by campus, gender, student status, and English language background

| ATLAS: An AI-supported simulation platform



Nam

History Taking

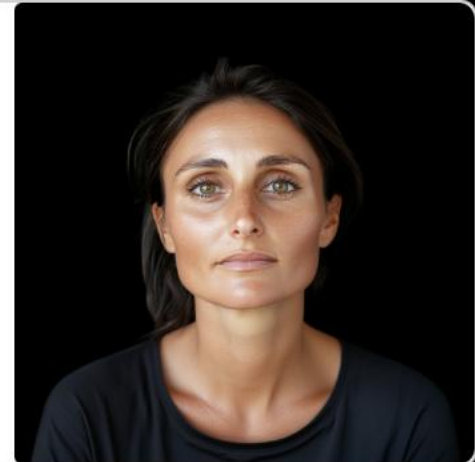
Start Conversation



Brooks

History Taking

Start Conversation



Marley

S3 Station

Start Conversation



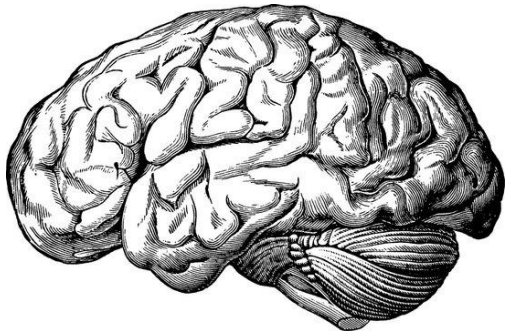
Jo

S3 Station

Start Conversation

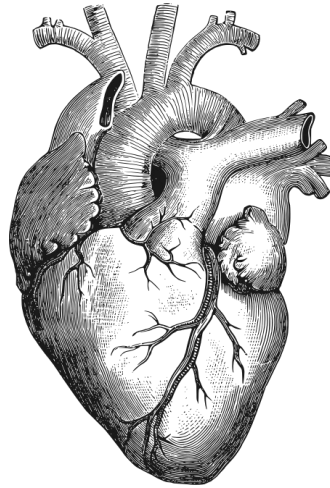


| PCIC: Three dimensions of clinical communication



Logical

Clinical reasoning, gathering the right information



Emotional

Rapport, empathy, reassurance

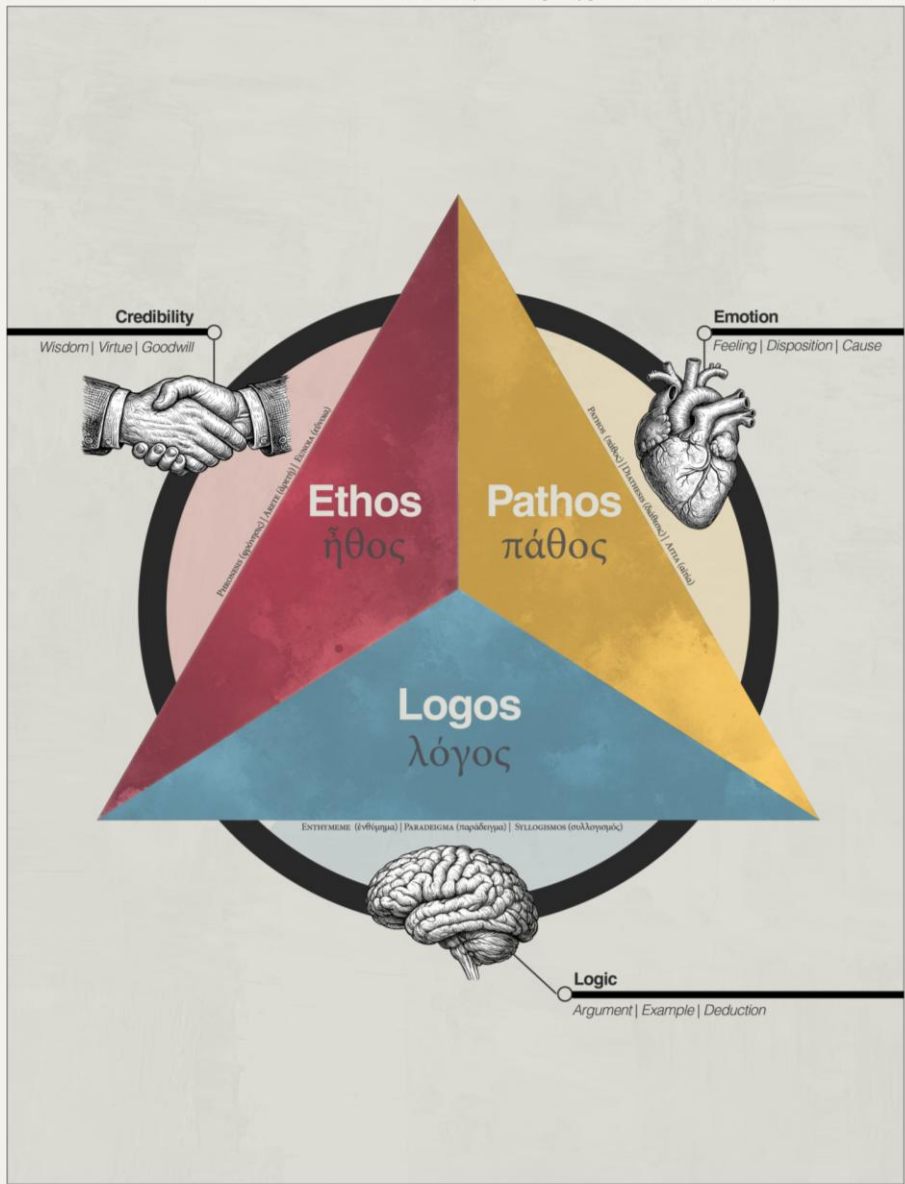


Moral

Professionalism, ethics, duty of care

Rhetorical Triangle

"Rhetoric is the faculty of observing in any given case the available means of persuasion." —Aristotle



Purposes | Diversify strategies. Guide messages. Persuade effectively.
Applications | Writing, speaking, designing, data storytelling.

Source | Aristotle's *Rhetoric*, 4th Century BCE
Origin | Aristotle, 384 – 322 BCE

From Aristotle to PCIC

LANGUAGE, CULTURE AND CURRICULUM
2024, VOL. 37, NO. 4, 435–455
<https://doi.org/10.1080/07908318.2024.2349781>

 **Routledge**
Taylor & Francis Group

 OPEN ACCESS  Check for updates

Interactional Competence for professional communication in intercultural contexts: Epistemology, analytic framework and pedagogy

David Wei Dai 

UCL Institute of Education, University College London, London, UK

| What we did

346

Pharmacy students

230 Australian · 116 Malaysian

6

Avatars

3 BPMH · 3 S3

Up to 3

attempts per avatar

tracked across attempts

2,215

transcripts coded

PCIC framework

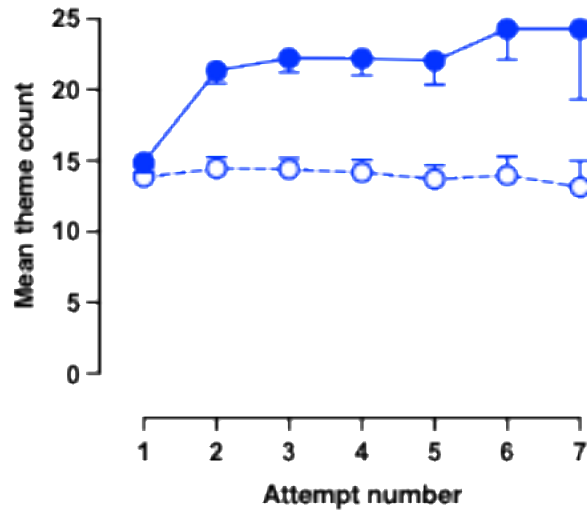


Analysed overall and by campus, gender, student status, and English language background.

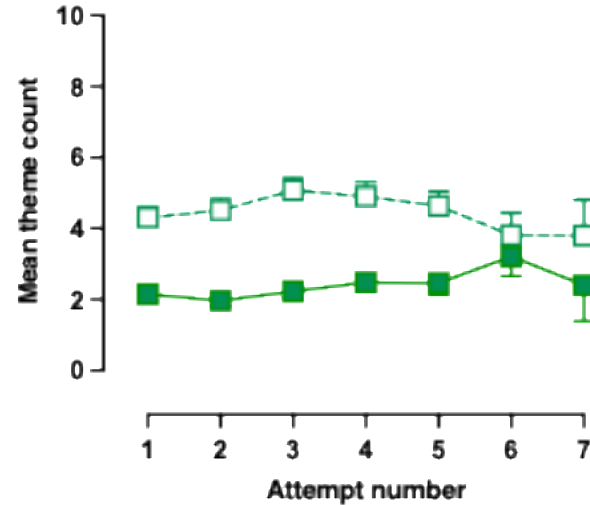
How communication changed across attempts

BPMH Station

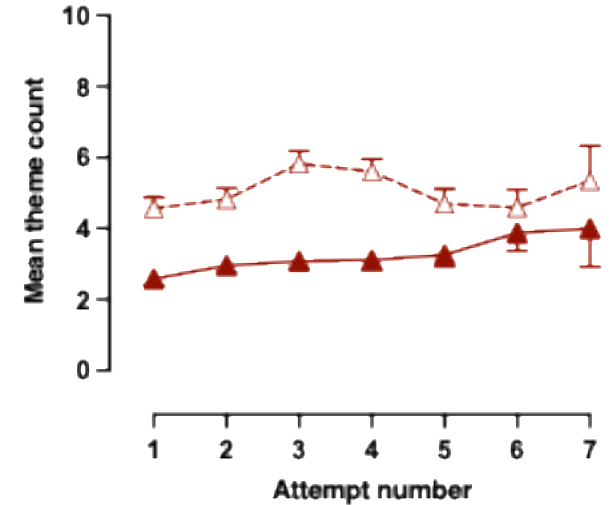
Logical



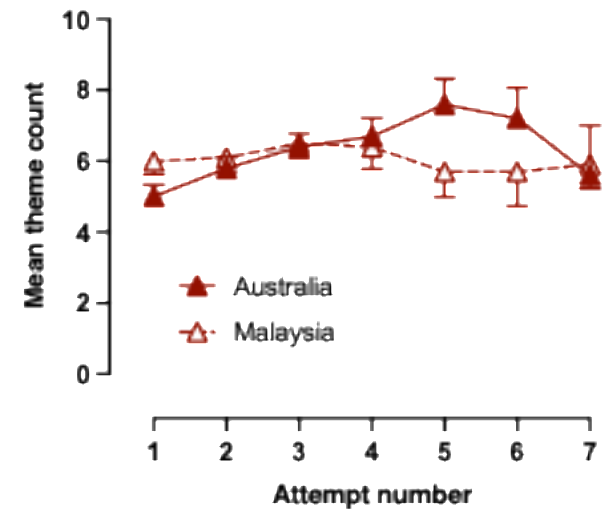
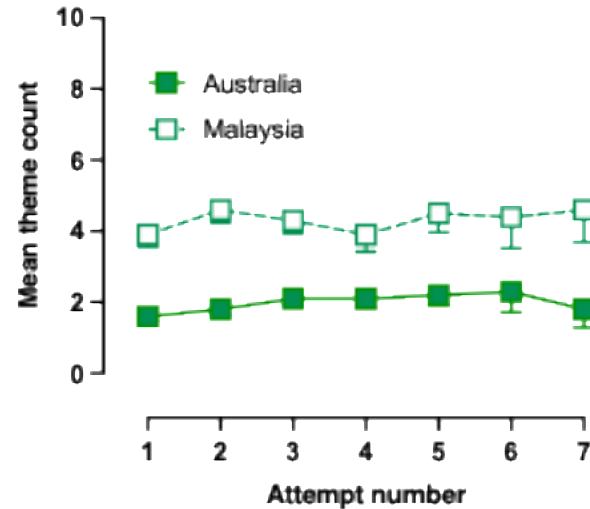
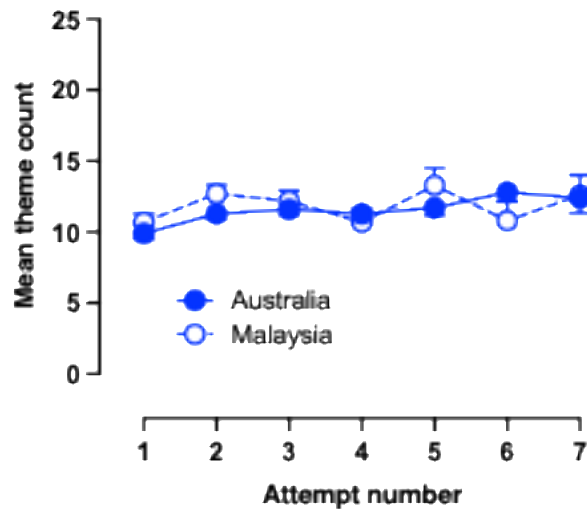
Emotional



Moral



S3 Station



Where the learning happened: BPMH station

AUSTRALIA

All Students	*** 4.6	*** 0.3	*** 0.5
Female Students	*** 5.1	*** 0.4	*** 0.6
Male Students	*** 3.8	* 0.2	*** 0.4
Domestic Students	*** 4.7	*** 0.4	*** 0.5
International Students	*** 4.6	0.1	*** 0.5
English L1 Students	*** 5.0	*** 0.3	*** 0.4
English L2 Students	*** 4.3	*** 0.3	*** 0.6

MALAYSIA

All Students	*** 1.0	*** 0.5	*** 0.9
Female Students	*** 0.9	*** 0.5	*** 1.0
Male Students	* 1.4	0.3	0.6
Domestic Students	** 0.8	*** 0.4	*** 0.7
International Students	*** 1.8	0.6	*** 1.3
English L1 Students	*** 3.8	0.8	*** 1.6
English L2 Students	*** 0.8	*** 0.5	*** 0.9



| Discussion

Why didn't emotional and moral themes grow?

The students

May need more deliberate teaching of empathy and ethics.

The cases

BPMH and S3 cue information-gathering.

The measure

Transcripts only - no tone, no eye contact, no body language.

What's next

Body language

Use audio and video, not just transcripts.

Teach the tool

Different learners use tools differently, do we teach them differently?

New scenarios

Test cases that invite empathy and ethical reasoning.

Thank you!

To you, my supervisors, colleagues and the
John and Nariel Ware Fellowship



Amna Mazeh

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I trust you...assessing the reliability of an entrustment-supervision scale embedded with the concepts and language of trust

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Steven Walker, BPharm(Hons), MCLinPharm, FANZCAP (Edu.), Monash University

Kirsten Galbraith, BPharm, MCLinPharm, FANZCAP (Lead&Mgmt, Edu), Monash University



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Background

- Entrustable Professional Activities (EPAs)- counselling, dispensing and compounding¹
- Entrustment-supervision (ES) scales are tools used when making entrustment decisions¹

Entrustment decision (supervising pharmacist to select which of the following level applies to this SPO):

Increasing Independence			Indicative of Pharmacist Level Performance
1	2	3	4
Observe only, even with direct supervision	Perform with direct, proactive supervision and intervention	Perform with indirect proximal (nearby) supervision, on request and quickly available	Perform with minimal supervision, available if needed, essentially independent performance

Background- Issues with the entrustment-supervision scale

Entrustment decision (supervising pharmacist to select which of the following level applies to this SPO):

Increasing Independence			Indicative of Pharmacist Level Performance
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only because level of difficulty of M3

Entrustment decision (supervising pharmacist to select which of the following level applies to this SPO):

Increasing Independence			Indicative of Pharmacist Level Performance
1	2	3	4
Observe only, even with direct supervision	Perform with direct, proactive supervision and intervention	Perform with indirect proximal (nearby) supervision, on request and quickly available	Perform with minimal supervision, available if needed, essentially independent performance

Background- Adaption of entrustment-supervision scales

- There are inconsistencies when making entrustment decisions²
- Jarret et al³ developed a pharmacy specific ES scale
- Supervisors 'gut' feelings are critical in entrustment-decision making^{4,5}
- *"Would I trust this learner with my own family?"*⁵

3b I would trust the learner to perform this task with on-demand, nearby preceptor supervision and **KEY** findings and work are **checked immediately afterward.**

<https://doi.org/10.5688/ajpe8523>



Background- Developed ES scale

- ES scale developed in consultation with a linguistic expert and pharmacist educators using a two-round survey to establish content and face validity

Entrustment Level	Description
1	You can only observe me counselling patients under our care on their medications
2	You are ready to counsel patients under our care on their medications with me watching you and intervening if needed
3	You are ready to counsel patients under our care on their medications without me watching you but I am available to give guidance or support if needed
4	You are ready to counsel patients under our care on their medications on your own and without supervision

Aim



To assess the reliability of an adapted entrustment-supervision (ES) scale embedding language of trust to support consistent entrustment decisions among pharmacists.

Step 1- Review of the literature to inform the language of trust Aim: To identify specific language terminology that evokes a feeling of trust in healthcare.	Step 2-ES development Aim: To develop an ES with terminology that evokes trust using the language identified in Step 1.	Step 3- Face validation of adapted ES Aim: To ensure the adapted ES is perceived to introduce trust-related concepts effectively.	Step 4- Testing the adapted ES for usability Aim: To evaluate whether the developed ES improves the consistency of ratings.
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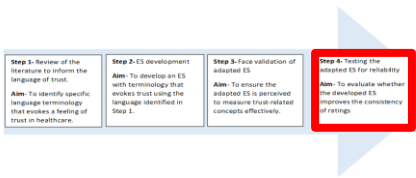
Method- Study Design

- 3 standardised vignettes for the EPA counselling were developed⁶
- Scripts were based on:
 - Modified Dreyfus model⁷;
 - Competencies as set out by the APC⁸; and
 - Five learner features summarised by the mnemonic 'A RICH'.⁹



Method- Study Design

- Inclusion criteria:
 - Ahpra general registered pharmacists;
 - Hospital or community pharmacists;
 - Supervised interns from 2023 onwards; and
 - Experience using ES scales



Method- Scale reliability

Online survey

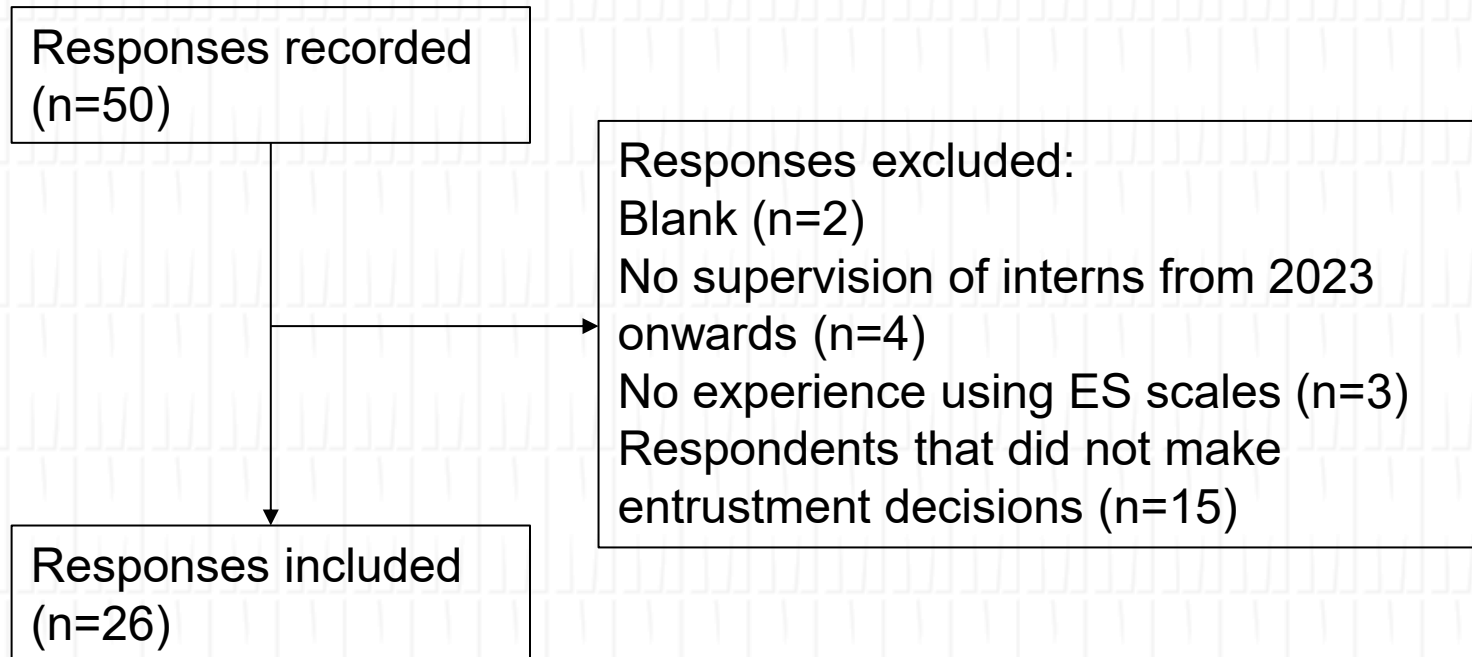


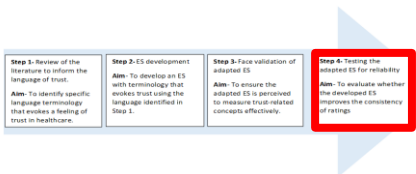
Scale reliability

- Quantitative data^{10,11}
 - Intraclass correlation coefficient (ICC)
 - Cronbach's alpha
- Qualitative data
 - Thematic analysis

Results- Scale reliability

- MUHREC 45305



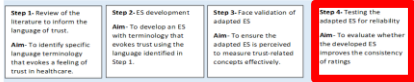


Results- Scale reliability

- Ahpra general registered pharmacists 100% (n=26)
- Community pharmacists 53.8% (n=14)
- Hospital pharmacists 46.1% (n=12)
- Mean years practicing experience 12.81 years (SD±5.83)

Results- Scale reliability

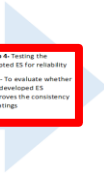
Entrustment Level	Vignette 1	Vignette 2	Vignette 3
	Frequency (N=23), No. (%)		Frequency (N=20), No. (%)
Level 1	11(47.8)	1(4.3)	-
Level 2	12(52.2)	7(30.4)	1(8.3)
Level 3	-	13(56.5)	7(29.2)
Level 4	-	2(8.7)	15(62.5)



Results- Scale reliability

- ICC indicated strong agreement among raters (ICC (2,k) =0.984, 95% CI [0.938-1.000])
- Cronbach's alpha 0.992 demonstrated strong internal consistency

Themes					
Clinical knowledge	Communication style and language used	Structure and delivery of counselling	Patient-centred care	Recognising professional boundaries and seeking support	Readiness for independent counselling



- Feedback included consistent phrases
- Repetition of themes among responses
- Feedback consistent with entrustment level
- Quantitative and qualitative data suggest high agreement among pharmacists



Discussion

- ICC and Cronbach's alpha demonstrate strong agreement^{10,11}
- Variability in entrustment decisions reflects the complex nature of trust¹²
- Summative entrustment decisions based on aggregated evidence is required¹²
- Supports programmatic assessment using multiple sources of evidence^{12,13}

Limitations

- Simulated vignettes only provide single discreet observations of a learner
- Sequence of vignettes may have introduced ordering effects
- Interpretation and perceptions of trust may vary among respondents

Future studies

- Investigating practical implications of the scale

Conclusion

An entrustment-supervision (ES) scale integrating the concepts and language of trust demonstrated reliability and consistency among pharmacists.

References

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