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MONASH PHARMACY AND PHARMACEUTICAL SCIENCES

2024 Pharmacy Education Symposium

ORAL PAPER SESSION 4: Role of digital health in pharmacy education and practice / Generative artificial intelligence in pharmacy education

Chair: Prof Zanfina Ademi

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2024 Pharmacy Education Symposium

Generative AI as a Personal Tutor for Research and Evaluation Skills

Dr Jacquie McLaughlin

Generative AI as a Personal Tutor for Research and Evaluation Skills

Jacqui McLaughlin, PhD*: Associate Professor, Director CIPhER, UNC Eshelman School of Pharmacy*
Kayley Lyons, PharmD, PhD*: Digital Health Education and Workforce Development Lead, University of Melbourne Centre for Digital Transformation of Health*
Cory Dal Ponte*: Learning Scientist and PhD Student, University of Melbourne Centre for Digital Transformation of Health*

Objective

Explore the use of AI for providing individualized feedback to students about evaluation skills

- Describe educational context of AI activity
- Provide prompts used for AI activity
- Detail findings from AI activity

1. Educational Context

Research and Evaluation Skills

Research and evaluation skills are critical for healthcare providers

Teaching these skills is resource-intensive, **requiring in-depth personalized feedback**

Small groups can mitigate time-consuming teaching tasks, but also benefit from facilitator feedback and support

ChatGPT is a generative artificial intelligence (genAI) capable of creating humanlike dialogue that **may facilitate student learning**

Fuller et al (2024); Jowsey et al (2023); Morbitzer et al (2021)

1. Educational Context

Research and Evaluation Courses

UNC ESHELMAN SCHOOL OF PHARMACY

THE UNIVERSITY OF MELBOURNE

- 2 courses
- 75 students (*n=20 UNC; n=55 UM*)
- 14 breakout groups of 5-7
- Students worked collaboratively to complete prompts **describing the evaluation plan** of a health-system issue

No statistical differences were found between the two courses and data were subsequently aggregated.

2. AI Activity

AI Instructions

Act as an expert in the learning health systems framework with a focus on socio-technical evaluation plans. When provided with an evaluation plan table, meticulously analyse its content based on the specific categories:

1. **Method of Evaluation**: Assess the appropriateness, robustness, and feasibility of the chosen evaluation method.
2. **Theoretical Framework**: Ensure that the theoretical framework is relevant to the evaluation's objectives and is applied correctly. If the plan does not mention a theoretical framework then propose an appropriate theory based on the objectives.
3. **Justification for Evaluation and/or Theoretical Framework**: Critique the provided justification, ensuring it's coherent and aligns with the chosen evaluation method and theoretical framework.
4. **Data Collection Methods**: Evaluate the chosen data collection methods for their relevancy, comprehensiveness, and potential biases.
5. **Data Sources**: Critically examine the listed data sources for their relevance, reliability, and potential to address the evaluation's objectives.
6. **Brief Description of Data Analysis**: Analyse the clarity, comprehensiveness, and relevance of the data analysis description. Ensure it fits the context of the evaluation and theoretical framework. If it's missing, then propose a data analysis plan.

Provide both strengths and potential areas of improvement for each plan, ensuring feedback is constructive, clear, and actionable.

2. AI Activity

Student Prompt

I'd like to receive feedback on the socio-technical evaluation plan below.
Please provide constructive feedback on the criteria and offer suggestions for potential areas of improvement. Provide a rating from beginner to advanced on the overall evaluation plan based on how well it addresses the rationale and objectives.

Rationale and objectives: *your team's answers here*
Method of Evaluation: *your team's answers here*
Theoretical Framework: *your team's answers here*
Justification for Evaluation: *your team's answers here*
Data Collection Methods: *your team's answers here*
Data Sources: *your team's answers here*

- Students asked to complete brief survey after activity.
- Descriptive statistics used for Likert-type items and thematic analysis for open-text items.

3. Evaluation Findings

AI Feedback

Overall Rating:

The provided evaluation plan demonstrates a good understanding of the research objectives and uses appropriate qualitative methods. However, there are areas for improvement, including further elaboration on the application of the UTAUT fram
more detailed information on data sources and sa

Rating: Intermediate

Areas of Improvement:

1. Provide a more detailed explanation of how the U clinical workflows and communication.
2. Include a clear data analysis plan that outlines h
3. Specify the criteria and procedures for selecting
4. Consider whether a socio-technical theory more more precise framework for analysis.

Strengths:

- The plan combines both qualitative and quantitative comprehensive understanding of the research quest
- Ethical considerations, such as patient anonymizatio

Areas of Improvement:

- Provide more details on the design of surveys and op
- Clarify the role and training of students in data collec
- Explain how the UTAUT framework will be applied or
- Develop a more comprehensive data analysis plan.
- Address potential biases in data collection methods.

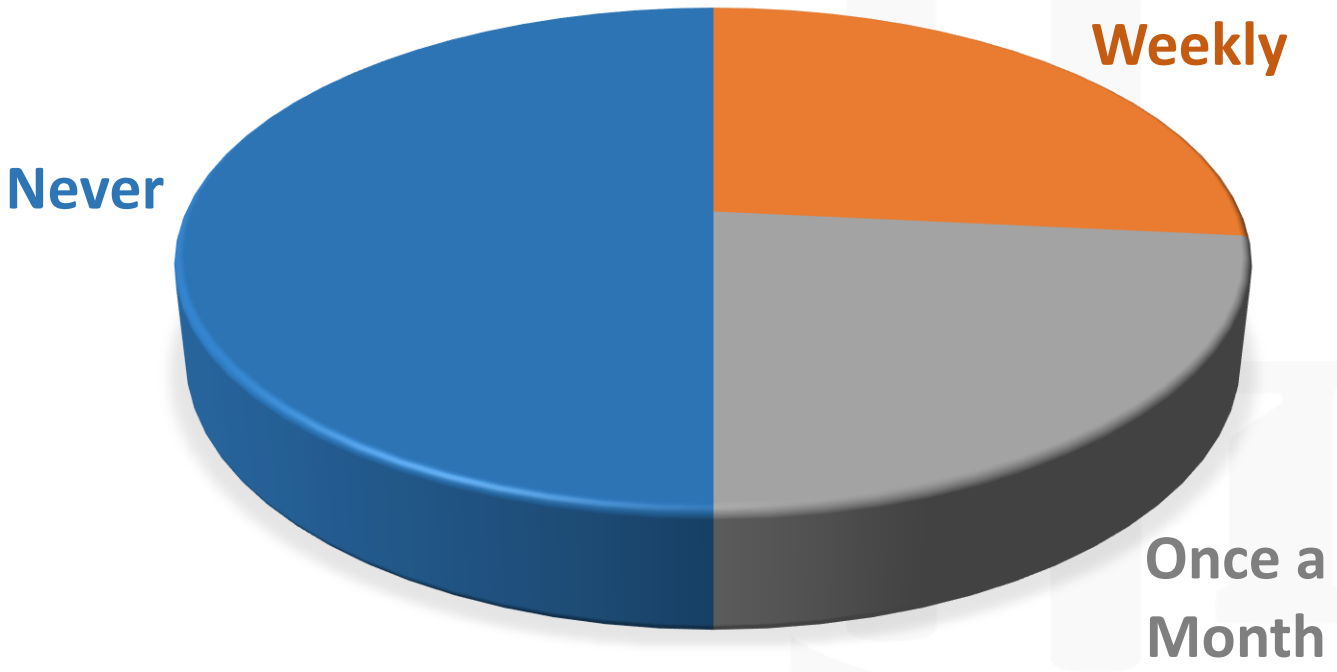
Overall, the plan shows potential but needs further development and clarity in various aspects to enhance its effectiveness in addressing the research objectives

4. **Data Collection Methods:**
   - **Strengths:**
     - Mixed methods are appropriate for capturing a comprehensive view of the program's impact by combining quantitative and qualitative data.
   - **Areas of Improvement:**
     - Specify the quantitative and qualitative data collection methods within the mixed methods approach.
     - Provide details on how the integration of both types of data will occur.
5. **Data Sources:**
   - **Strengths:**
     - Inclusion of readmission rates, patient interviews, and healthcare staff focus groups provides a well-rounded view of the program's effects.
   - **Areas of Improvement:**
     - Clarify the specific aspects of clinical workflows that will be assessed through readmission rates.
     - Ensure that patient interviews and staff focus groups are representative of diverse perspectives.

3. Evaluation Findings

n=64, 85.3% response rate

How frequently do you use ChatGPT?



3. Evaluation Findings

n=64, 85.3% response rate

Survey Item: The ChatGPT feedback	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
…was valuable	30%	55%	9%	6%	0%
…helped me learn about evaluation	13%	58%	19%	11%	0%
…helped my group improve our evaluation plan	23%	55%	14%	2%	0%
…increased my interest in generative AI	48%	38%	9%	5%	0%

3. Evaluation Findings

Most (n=44, 68.8%) described adaptive responses to the feedback (Kelley, 1973)

…we needed to be more specific and go more in-depth in parts of our evaluation design

Following review of the feedback provided by ChatGPT, I would consider incorporating data from other institutions…

When asked about their feedback, rarely did participants not trust or disagree with what was provided

Summary

First known ChatGPT study to provide feedback to pharmacy and health professions students about research and evaluation skills.

ChatGPT provided **immediate individualized feedback** to 14 small groups, a feat otherwise unattainable

We demonstrated favourable perceptions from **learners who were mostly new to ChatGPT**

Future research should focus on design principles that can assist educators to **optimally utilise genAI within their courses**

References and Resources

Fuller, K., Morbitzer, K. A., Zeeman, J. M., M. Persky, A., C. Savage, A., & McLaughlin, J. E. (2024). Exploring the use of ChatGPT to analyze student course evaluation comments. *BMC Medical Education*, *24*(1), 423.

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Generative AI as a Personal Tutor for Research and Evaluation Skills

UNC | ESHELMAN SCHOOL OF PHARMACY

Jacqui McLaughlin: Jacqui_mclaughlin@unc.edu

Kayley Lyons: kayley.lyons@unimelb.edu.au

Cory Dal Ponte: cory.dalponte@unimelb.edu.au

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A portfolio-based workplace learning plan to assess a pre-registrant (intern) pharmacists' advancing competencies

A/Prof Steven Walker

MONASH University

A portfolio-based workplace learning plan to assess pre-registrant (intern) pharmacists' advancing competencies

Carmen Abeyaratne BPharm (Hons) MClinPharm

Steven Walker BPharm (Hons) MClinPharm

Alex Edwards BPharm (Hons) MClinPharm

Ben Emery BPharm MPharmPrac

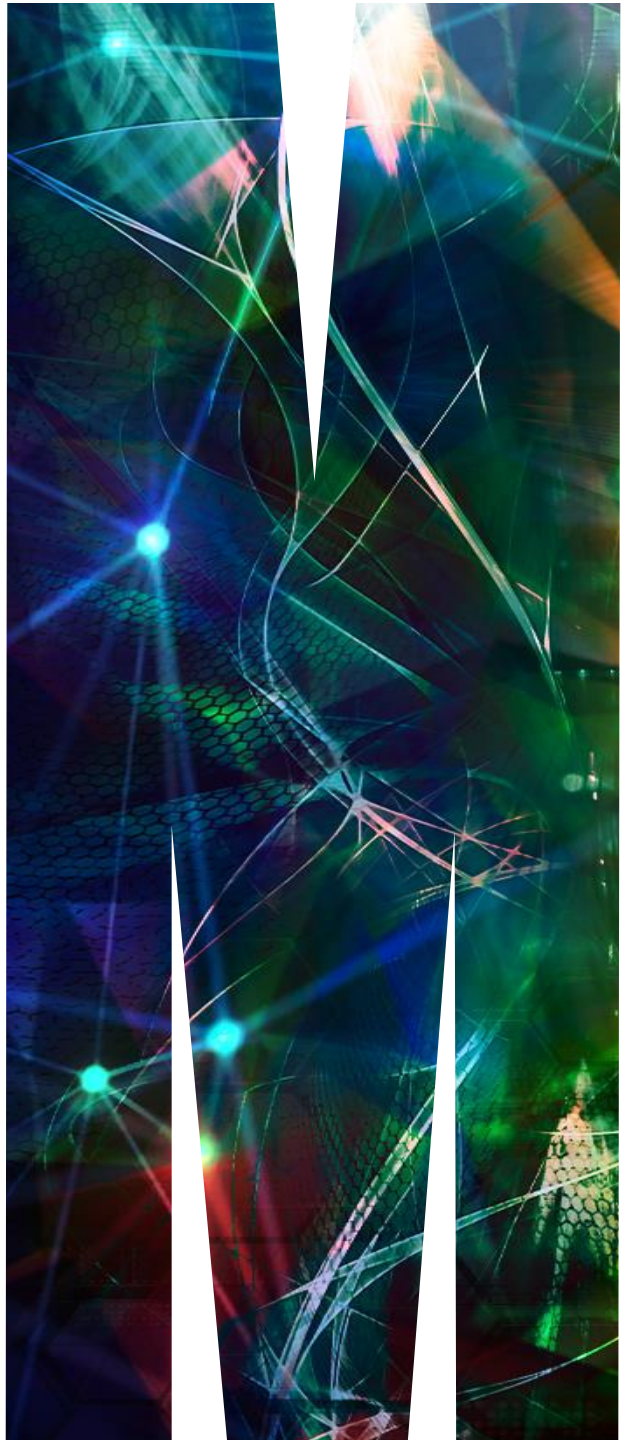
Faculty of Pharmacy and Pharmaceutical Sciences

Experiential Development and Graduate Education (EDGE)

Monash University, Australia

Steven.walker@monash.edu

@stwalker88



Introduction

- In Australia, pharmacy practice is underpinned by the **National Competency Standards Framework** (NCSF).[1]

- **Pre-registrant pharmacists (i.e. interns)** complete a **year-long supervised program** in either hospital or community setting to meet core competencies of the NCSF.

1. Pharmaceutical Society of Australia. National Competency Standards Framework for Pharmacists in Australia: Pharmaceutical Society of Australia; 2016. Available from: https://www.psa.org.au/practice-support-industry/national-competency-standards/

National Competency Standard Framework

Domain 1:
Professionalism and ethics

Domain 2:
Communication and collaboration

Domain 3:
Medicines management and patient care

Domain 4:
Leadership and management
Standards 4.1 and 4.2

Domain 5:
Education and research

1. Pharmaceutical Society of Australia. National Competency Standards Framework for Pharmacists in Australia: Pharmaceutical Society of Australia; 2016. Available from: https://www.psa.org.au/practice-support-industry/national-competency-standards/

Dissecting a competency standard

Domain 1:
Professionalism and ethics

Standard 1.5: Apply expertise in professional practice					
Enabling competency	**Performance criteria**				
	General level	**Evidence examples**	**Transition level Stage 1**	**Consolidation level Stage 2**	**Advanced level Stage 3**
1. Apply expert knowledge and skills.	Applies general knowledge in core practice areas.	*Deals effectively with routine practice scenarios.*	Applies general knowledge in core practice area(s).	Applies comprehensive, high level knowledge in defined practice area(s).	Applies advanced knowledge in defined practice area(s).

General | **Advancing**

Introduction

- In 2016, an **extension work-integrated learning (WIL) program** was established to fast-track intern **development of more advancing NCSF competencies.**[2]

- Interns are expected to complete a series of **workplace-based assessments (WBA)** as part of a year-long **workplace learning plan (WLP).**

2. Monash University. (2023). Intern Training Program and Intern Foundation Program. Available from: https://www.monash.edu/pharm/future/courses/postgraduate/internship-training-program

Summary of work

- **In 2023, a more overt portfolio based WLP** was established

- For each of the 5 domains, interns were required to select a range of WBAs for their portfolio submission

Aim

The aim of this project was to determine **the most commonly performed WBAs** submitted by **pharmacy interns** completing a **portfolio-based assessment to demonstrate advancing competency.**

Results

- In 2023- 231 pharmacy interns were enrolled in the program
- N= 120 (52%) community interns
- N= 111 (48%) hospital interns

Domain 1

1.5 Apply expertise in professional practice

Interns are required to submit evidence that demonstrates their initial development of expertise in a more advanced area of practice

Domain 1 Reflection Rubric

- Training received
- Lessons learnt
- Development plan

+

Evidence of Applying skill in practice
(depends on activity)

- Use suggested rubric (see Moodle)

Results- Domain 1: Professionalism and ethics

Activity	Hospital (n=111)	Community (n=120)
Therapeutic drug monitoring	16%	-
Nicotine replacement therapy	19%	1%
Aseptic compounding	**36%**	-
Complex compounding	-	6%
Aged care services	14%	17%
Specialist training	15%	1%
Professional services	-	23%
Wound care management	-	**37%**
Opioid replacement therapy	-	15%

Domain 2

Domain 2:
Communication and collaboration

2.2.2 Engage in teamwork and consultation

2.3.1 Use appropriate communication skills

ONE piece of interprofessional
Verbal Communication evidence

+

ONE piece of interprofessional
Written Communication evidence

Results- Domain 2: Communication and collaboration

Activity	Hospital (n=111)	Community (n=120)
Doctor email/letter	4%	**81%**
Inpatient/progress note	**60%**	-
Medicines info report (Dr)	12%	6%
Medicines info report (Nurse)	1%	-
Medicines info report (Pharmacist)	3%	-
Text to Dr/Pharmacist	15%	-
Dispensing history note	-	12%
Pharmacist email	3%	1%
Riskman entry	2%	-

Domain 3

Domain 3:
Medicines management and patient care

3.1 Develop a patient-centred, culturally responsive approach to medication management
3.2 Implement the medication management strategy or plan
3.3 Monitor and evaluate medication management

Simple Medication History	**Simple** Leave Certificate	**Simple** Diabetes MedsCheck
Simple Primary Care Encounter	**Simple** Med Reconciliation	**Simple** Mini-CEX

Results- Domain 3: Medicines management and patient care

Activity	Hospital (n=111)	Community (n=120)
Best Possible Medication History	**43%**	13%
Primary health care case	1%	**44%**
Medication reconciliation	33%	12%
Medication chart review	11%	-
Mini-CEX	3%	2%
MedsCheck	-	14%
Medication order review	4%	-
Clinical intervention debrief	3%	1%
Carer/leave certificate	-	14%
ClinCAT	2%	-

Domain 4

Domain 4:
Leadership and management
Standards 4.1 and 4.2

4.3.1 , 4.3.2, 4.3.3 , 4.3.4, 4.5.3, 4.7.1, 4.7.2, 4.7.3, 4.7.4, 4.7.5, 4.7.6, 4.7.7

Governance, resource management, risk management, guideline development

Interns are required to submit evidence that is mapped to one of the enabling competencies in this domain

Domain 4 Reflection Rubric
- Lessons learnt
- Impact on organisation
- Development plan

+

Evidence of leadership/management activity (depends on activity)

Results- Domain 4: Leadership and management

Activity	Hospital (n=111)	Community (n=120)
MedSafety Audit/QUM	55%	-
Payroll tool	1%	12%
Policy procedure checklist	2%	7%
Contribution to QCCP audit	-	3%
Stocktake tool	8%	75%
Guideline review/development	24%	3%
Ward finance report	6%	-
Adverse drug reaction review	3%	-
Formulary submission review	3%	-

Domain 5 :Education

Domain 5:
Education and research

5.1.2 Conduct education and training consistent with educational practice

5.1.3 Contribute to continuing professional development of others

5.1.4 Link practice and education

Evidence of delivering education
Supervision OR Presentation

Results- Domain 5: Education and research

Activity	Hospital (n=111)	Community (n=120)
Learner Feedback	-	22%
Learner supervision	9%	**59%**
Educational presentation	**78%**	18%
Journal club presentation	13%	1%

Discussion

- This is the **first pharmacist pre-registrant program in Australia** which uses a **portfolio-based WLP to assess advancing competencies**.

- Similar **portfolio-based assessments** have been used in **medical education** with WBA tools as evidence[3]

- **Student-centric approach** allowing for flexibility and promoting **self-regulated learning[3]**

- **Opportunities to align with global advanced competencies framework[4]**

3. Tan, R., Qi Ting, J. J., Zhihao Hong, D., Sing Lim, A. J., Ong, Y. T., Pisupati, A., Xin Chong, E. J., Chiam, M., Inn Lee, A. S., Shuen Tan, L. H., Chew Chin, A. M., Wijaya, L., Fong, W., & Radha Krishna, L. K. (2022). Medical Student Portfolios: A Systematic Scoping Review. Journal of Medical Education and Curricular Development, 9. https://doi.org/10.1177/23821205221076022
4. Meilianti S, Galbraith K, Bader L, Udoh A, Ernawati D, Bates I. The development and validation of a global advanced development framework for the pharmacy workforce: a four-stage multi-methods approach. Int J Clin Pharm. 2023 Aug;45(4):940-951. doi: 10.1007/s11096-023-01585-x.

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Limitations

- Influenced by selection of activities available
- Self-reported data
- Limited assessment of impact

Conclusions

- **Utilising portfolio-based WLP evidence** allows for **structured documentation of development in NCSF domains of competency**.[5]

- Similar portfolio-based WLPs may be adopted by other pre-registrant or early career training programs

5. Peeters, M. J. (2017). Targeting assessment for learning within pharmacy education. *American Journal of Pharmaceutical Education*, *81*(8)

Follow up questions or comments?

Steven.walker@monash.edu

References

1. Pharmaceutical Society of Australia. National Competency Standards Framework for Pharmacists in Australia: Pharmaceutical Society of Australia; 2016. Available from: https://www.psa.org.au/practice-support-industry/national-competency-standards/
2. Monash University. (2023). Intern Training Program and Intern Foundation Program. Available from: https://www.monash.edu/pharm/future/courses/postgraduate/internship-training-program
3. Tan, R., Qi Ting, J. J., Zhihao Hong, D., Sing Lim, A. J., Ong, Y. T., Pisupati, A., Xin Chong, E. J., Chiam, M., Inn Lee, A. S., Shuen Tan, L. H., Chew Chin, A. M., Wijaya, L., Fong, W., & Radha Krishna, L. K. (2022). Medical Student Portfolios: A Systematic Scoping Review. Journal of Medical Education and Curricular Development, 9. https://doi.org/10.1177/23821205221076022
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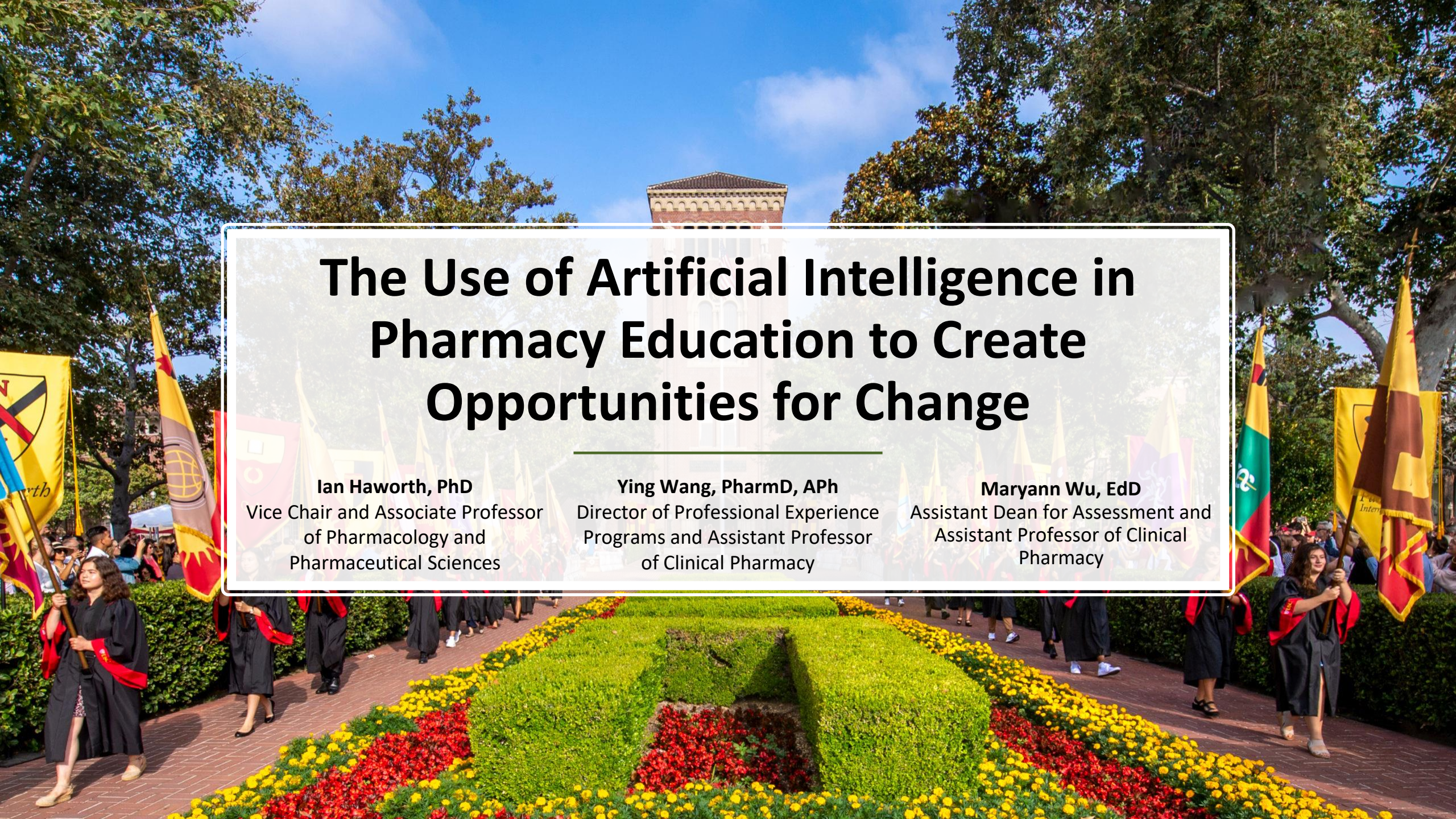
The Use of Artificial Intelligence in Pharmacy Education to Create Opportunities for Change

Dr Maryann Wu



The Use of Artificial Intelligence in Pharmacy Education to Create Opportunities for Change

Ian Haworth, PhD
Vice Chair and Associate Professor of Pharmacology and Pharmaceutical Sciences

Ying Wang, PharmD, APh
Director of Professional Experience Programs and Assistant Professor of Clinical Pharmacy

Maryann Wu, EdD
Assistant Dean for Assessment and Assistant Professor of Clinical Pharmacy

USC University of Southern California

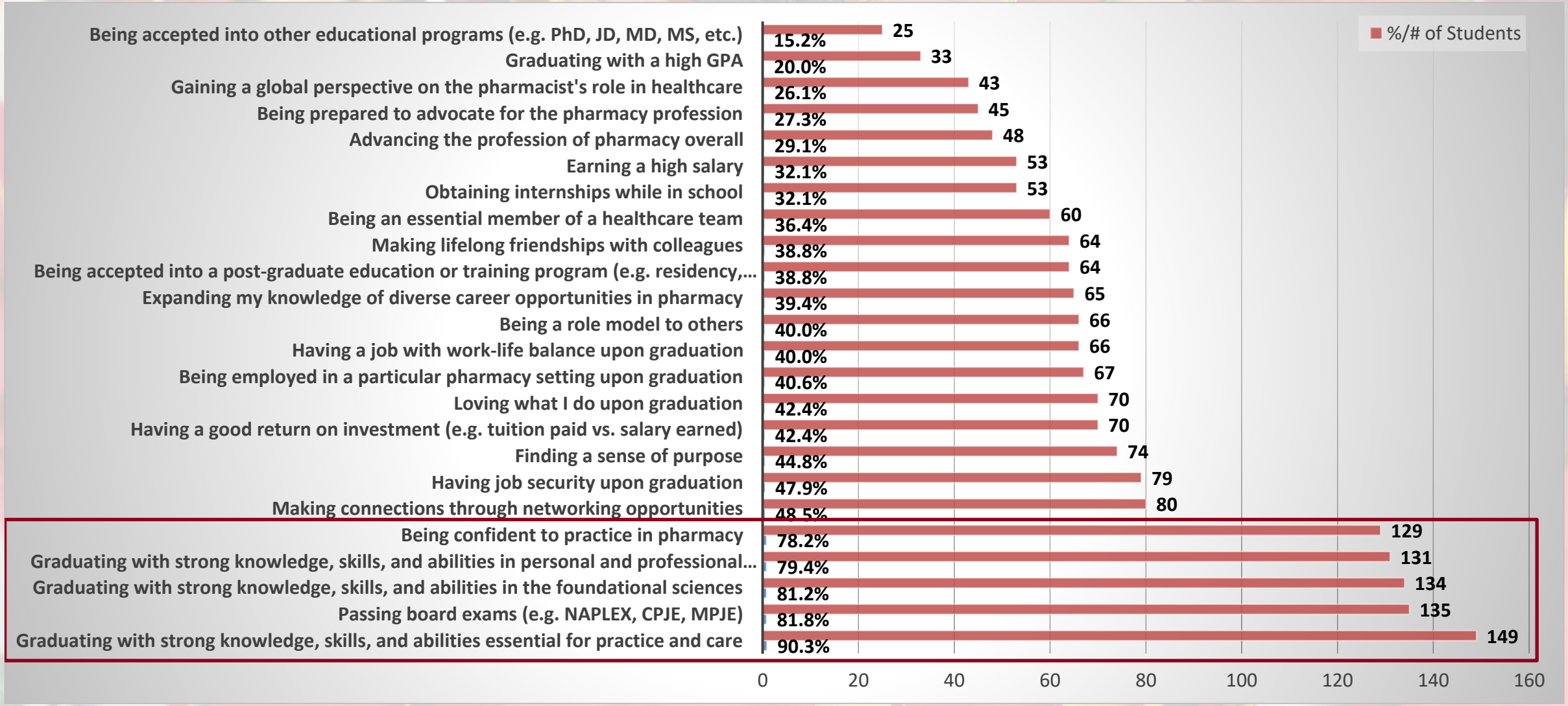
- Located in Los Angeles, California
- Private research university
- Student body (2023-2024 academic year)
- **47,000 total students at USC**
  - 21,000 undergraduates
  - 26,000 graduate and professional students
- **1,187 students at USC Mann School of Pharmacy and Pharmaceutical Sciences**
  - 673 professional practice (PharmD) students
  - 71 doctoral research (PhD) students
  - 32 doctoral other (DRSc) students
  - 239 master's students
  - 8 graduate visitors
  - 164 undergraduates

Background

- The 2023 American Association of Colleges of Pharmacy (AACP) indicates an **average loan of $167,711 USD** to finance a **three-to-four-year PharmD education**.
- **Career aspirations are becoming wider and more diverse** (e.g. hospital, ambulatory care, community, pharmaceutical industry, managed care).
- **Needs of pharmacists** are **changing rapidly.**
- Students are **seeking further education and training** upon graduation (e.g. residencies and fellowships).
- There is a **responsibility to maximize student success outcomes** while also **meeting the healthcare needs of society**.
- This may be facilitated through the use of **AI-SiPS (Artificial Intelligence - Success in Pharmacy School).**

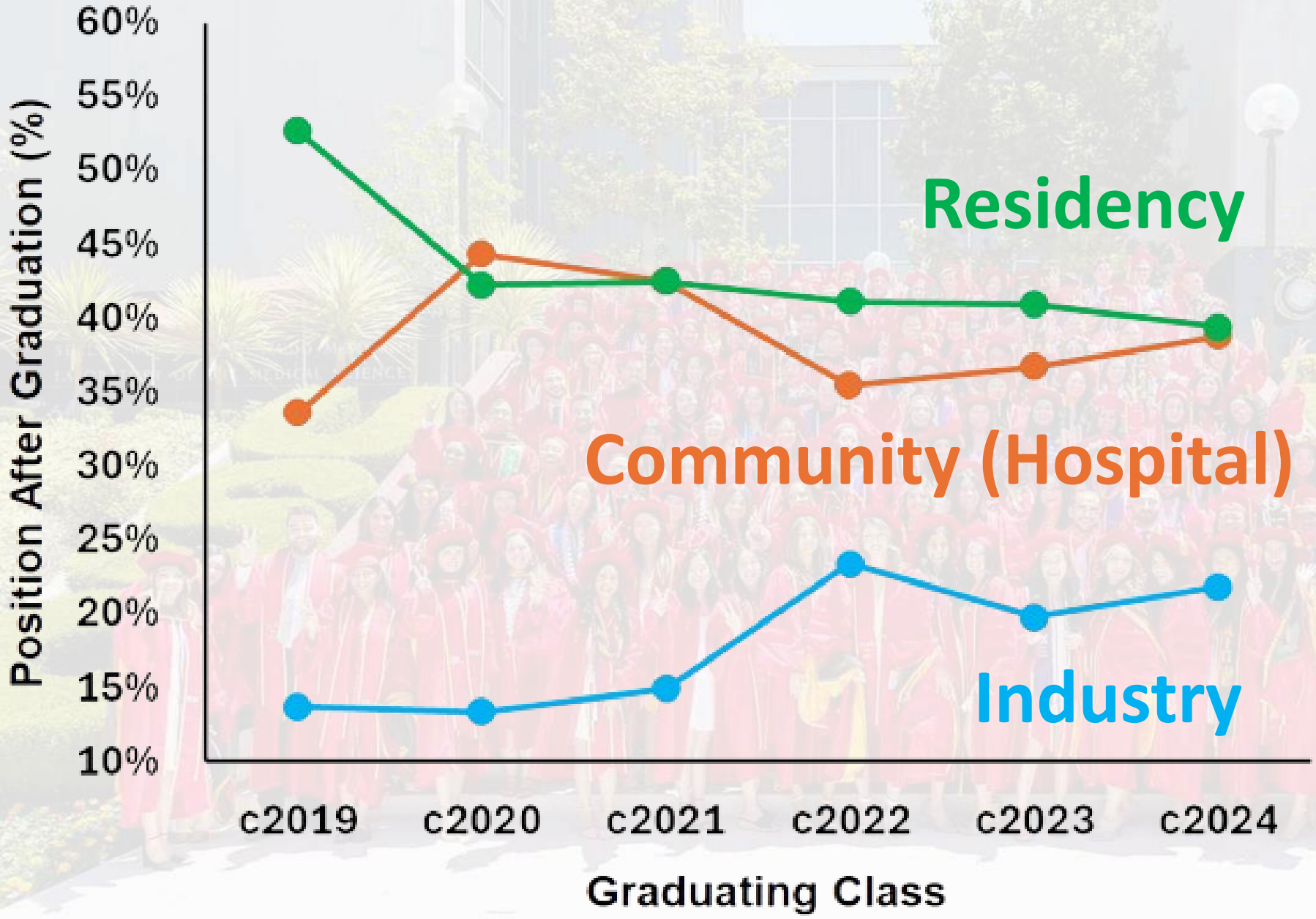
Source: AACP: https://www.aacp.org/sites/default/files/2023-08/2023-gss-national-summary-report.pdf

How Our Class of 2024 Graduating Students Defined "Success" in Pharmacy



Source: 2024 AACP Graduating Student Survey (USC Supplemental)

Actual Outcomes Upon Graduation: “RIC(H)” Outcomes



Hospital pharmacist
Clinic-based pharmacy practice

Independent community pharmacy
Chain community pharmacy
Home care

Government or regulatory agency
Pharmaceutical research
Managed care (health economics)

Objectives

- To collect and curate **curricular and co-curricular data** related to student outcomes at **multiple stages** of the **PharmD program**.

- To build a **multi-step AI model (AI-SiPS)** that utilizes these data to identify variables that can facilitate **student success** upon graduation.

Source: AACP: https://www.aacp.org/sites/default/files/2023-08/2023-gss-national-summary-report.pdf

Node-Based Data Analytics using KNIME

- AI-SiPS model built using KNIME (Konstanz Information Miner)
- A free, low-code/no-code software
- Intuitive and opens up data analytics to content experts
- Allows assessment questions to be driven by real-time data
- Can “convert” data into a narrative conversation
- Widely applicable to all fields
- Lots of help online

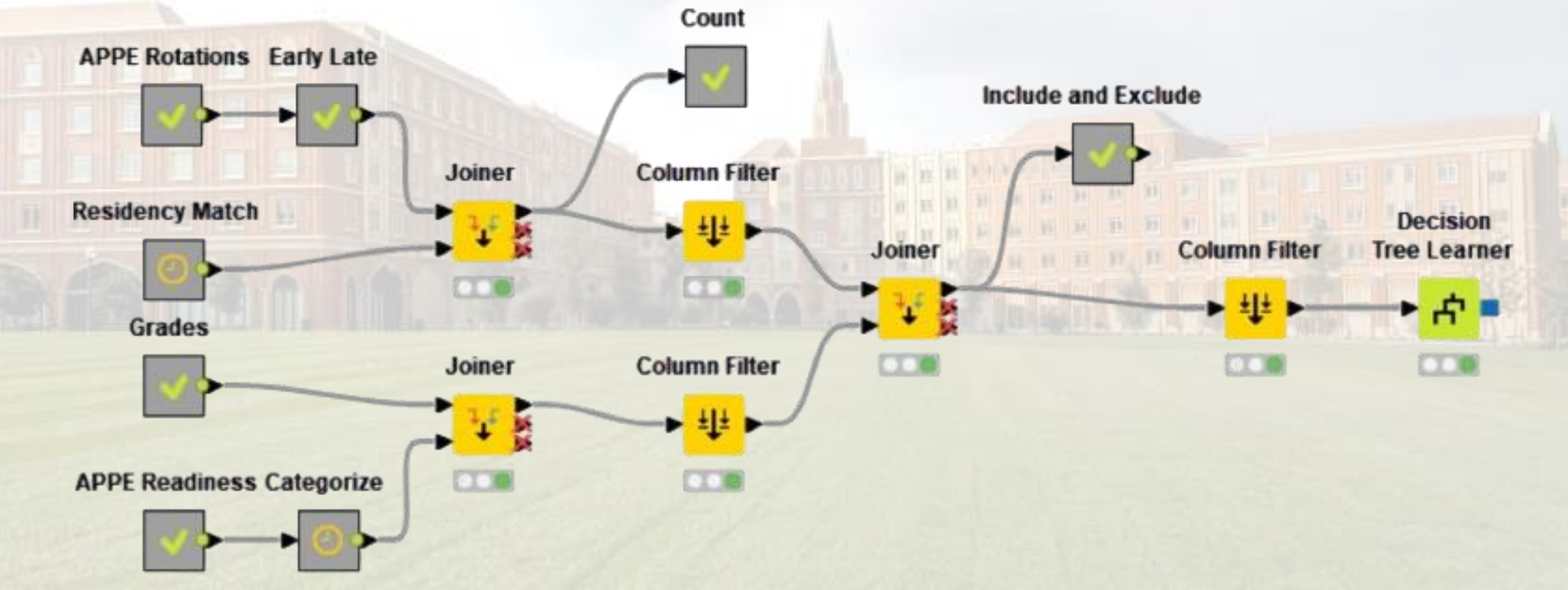
https://www.knime.com

Sample AI-SiPS KNIME Workflow

Read and Process Input Data

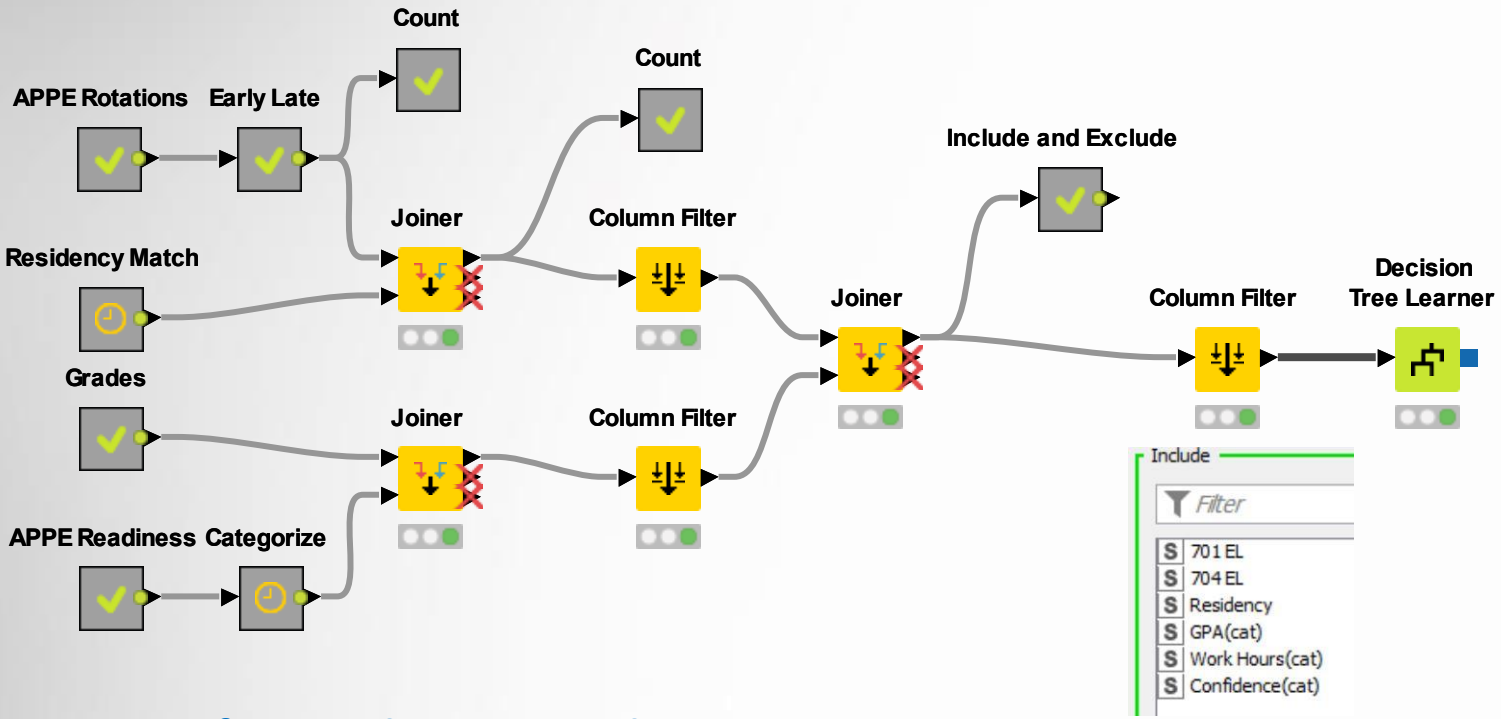
Combine Data and Choose Data Set for Analysis

Calculate and Visualize Output

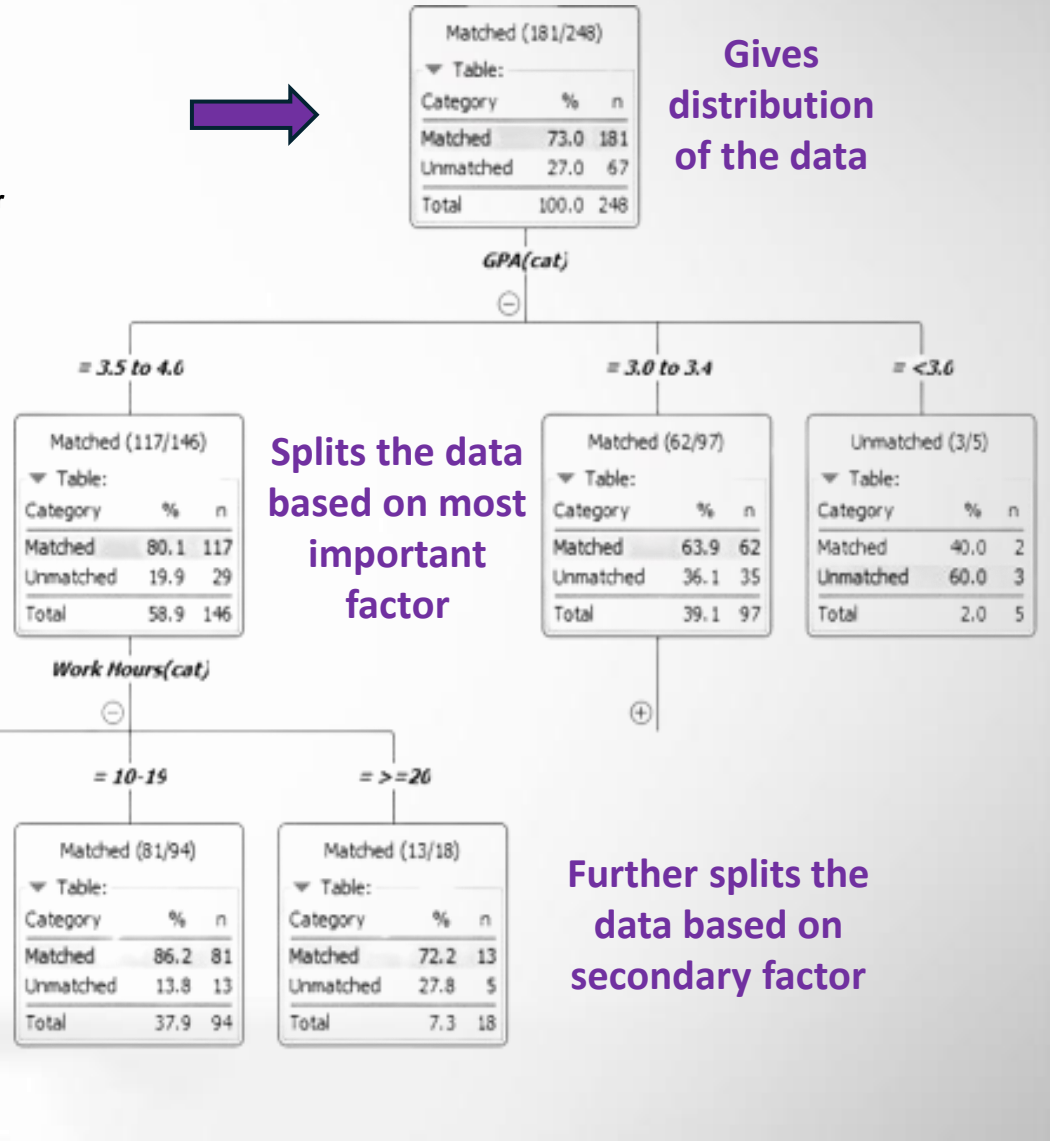


What Leads to Success in Matching for Residency?

KNIME Workflow



Decision Tree



Gives distribution of the data

Splits the data based on most important factor

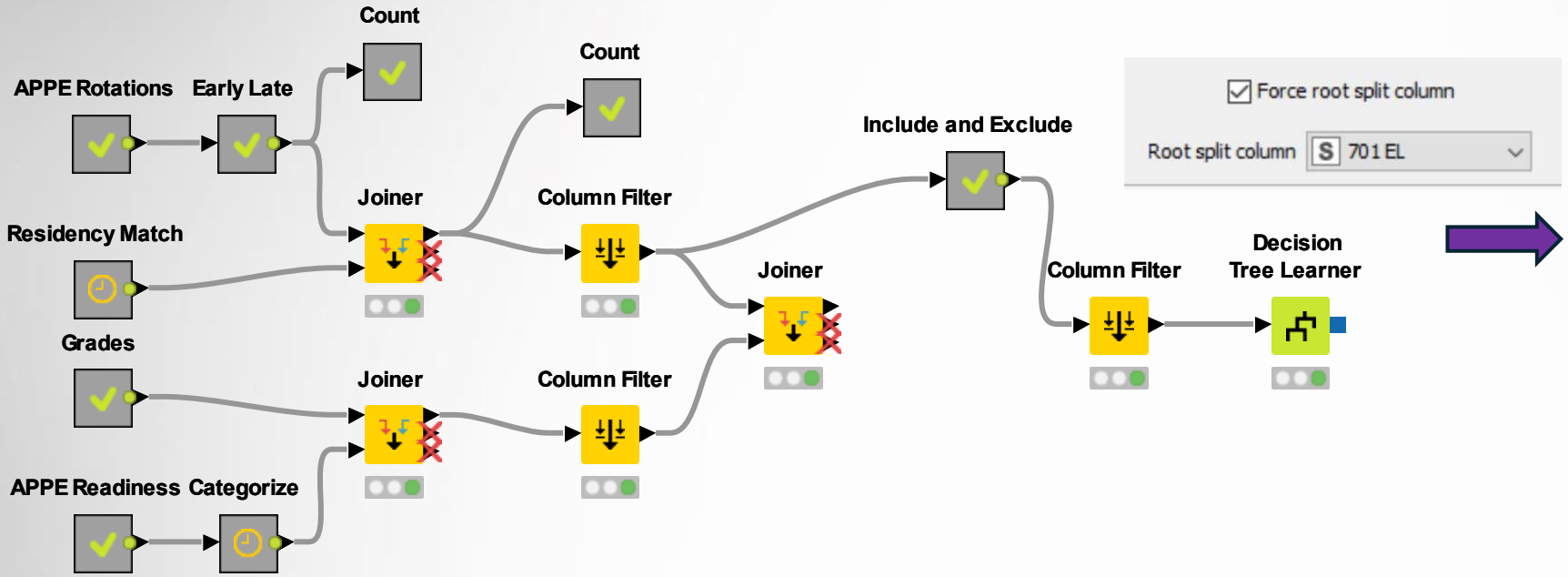
Further splits the data based on secondary factor

Narrative for Matching to Residency

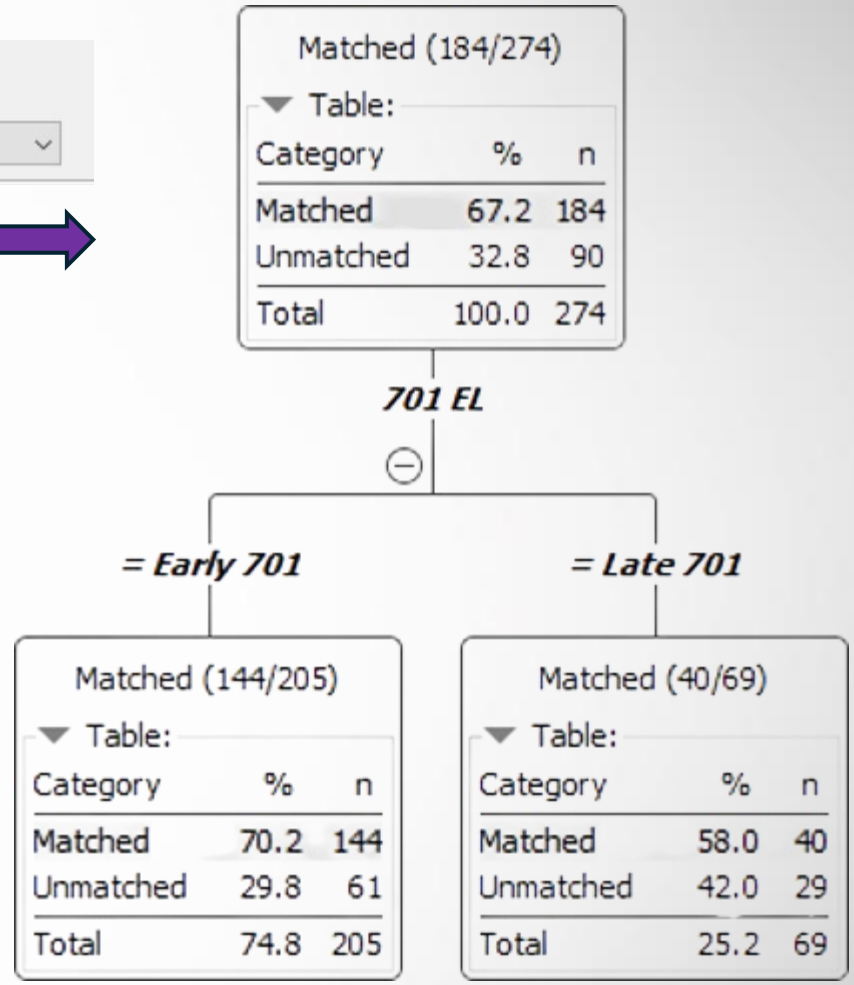
- Classes of 2019-2024
- Data for 248 students (limited by survey response)
- Match rate to residency: 73.0%
- Matching to residency driven by GPA: a match rate of 80.1% for GPA >3.5
- For students with GPA >3.5, working from 10 to 19 hours is optimal: match rate is 86.2%
- **Key takeaway: A balance of academic success and professional experience is important**

Does APPE Rotation Order Affect Residency Match?

KNIME Workflow



Decision Tree



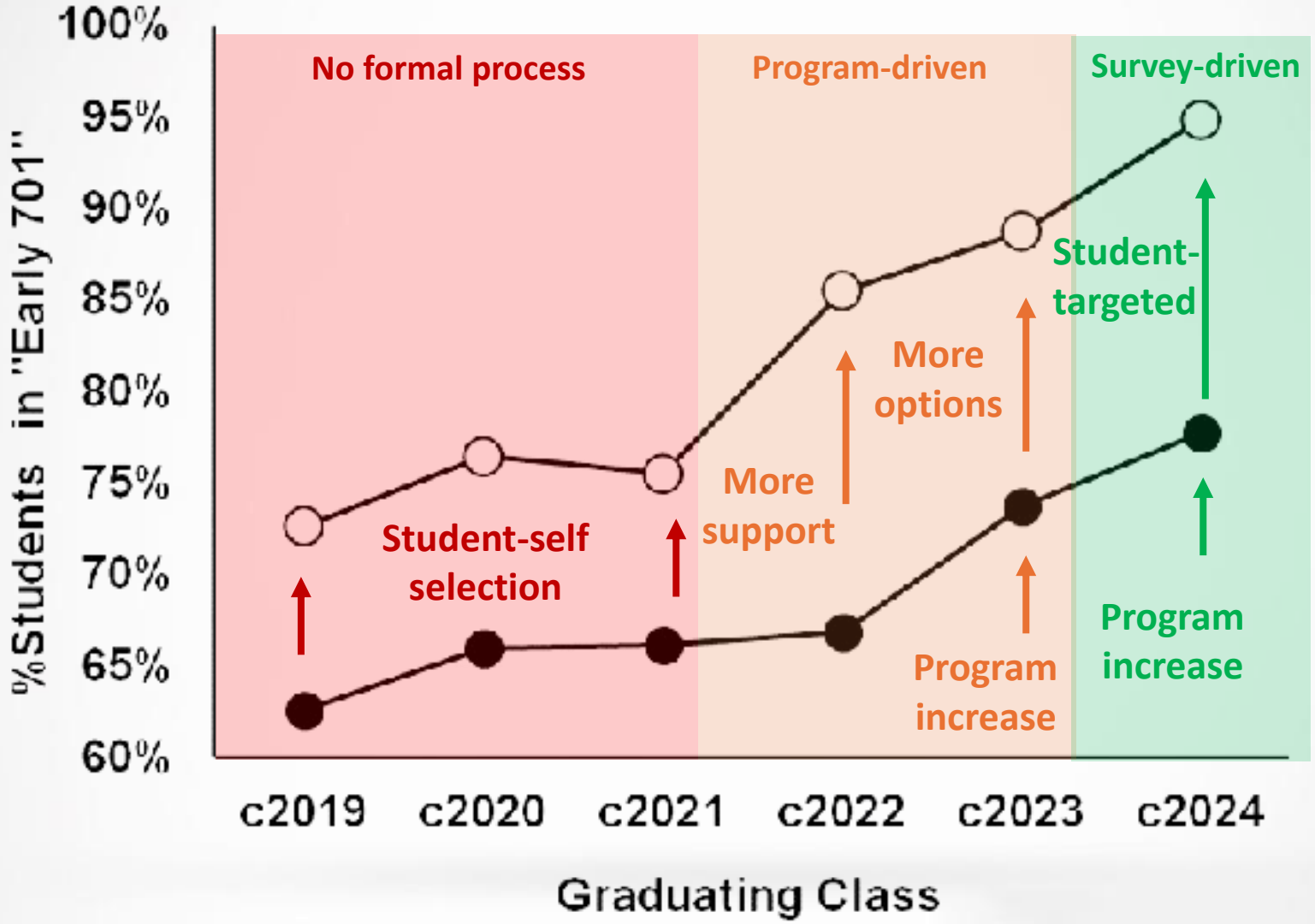
Narrative for Matching to Residency

- Classes of 2019-2021
- Data for 274 students
- Match rate to residency: 67.2%
- Matching to residency is improved if a student is assigned an “Early 701”: 70.2% vs. 58.0%
- **Key takeaway: Can we ensure that students who want a residency have more opportunity to take an “Early 701”?**

Wang Y, Wu M, Haworth IS. Using Artificial Intelligence to Evaluate Sequencing of Advanced Pharmacy Practice Experience Schedules for Residency Matching Success. AACP Exper Educ Newslett. 2023;10.

Intervention from AI Results: Survey in Fall for Residency Plans

Only 75% of students desiring a residency had an "Early 701" (acute care rotation)



○ Residency Applicants

● All Students

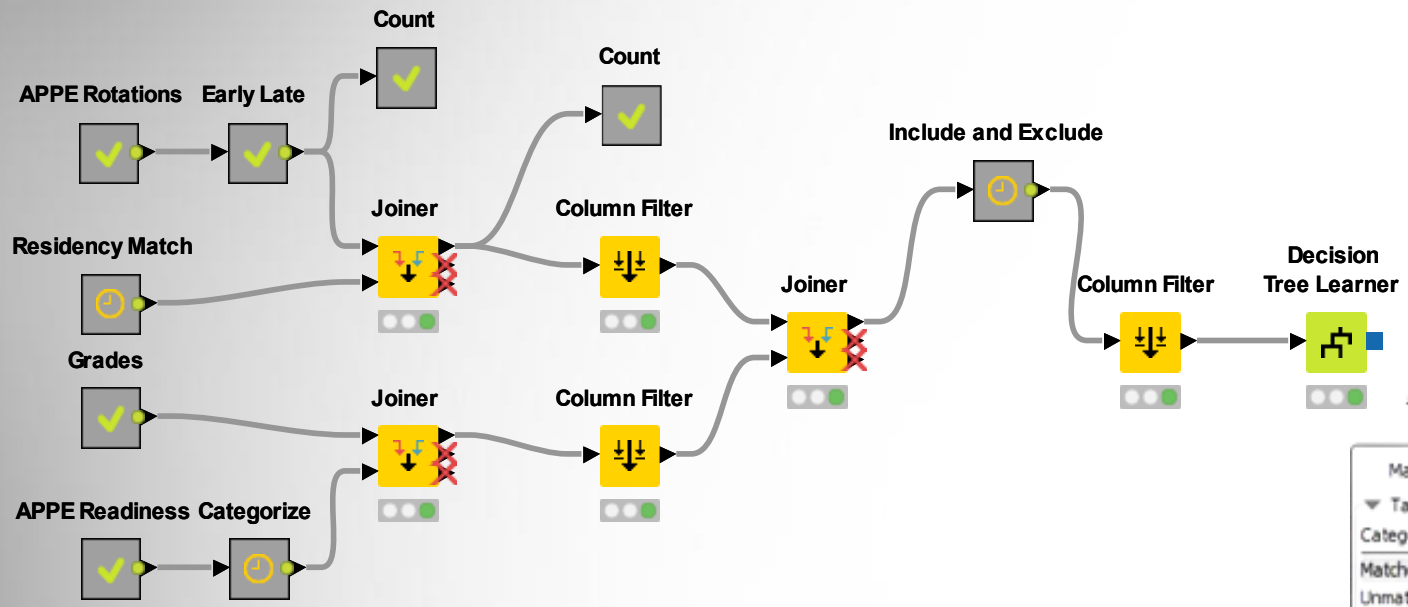
95% of students desiring a residency now have an "Early 701" (acute care rotation)

Workload effect: Reduction in change requests

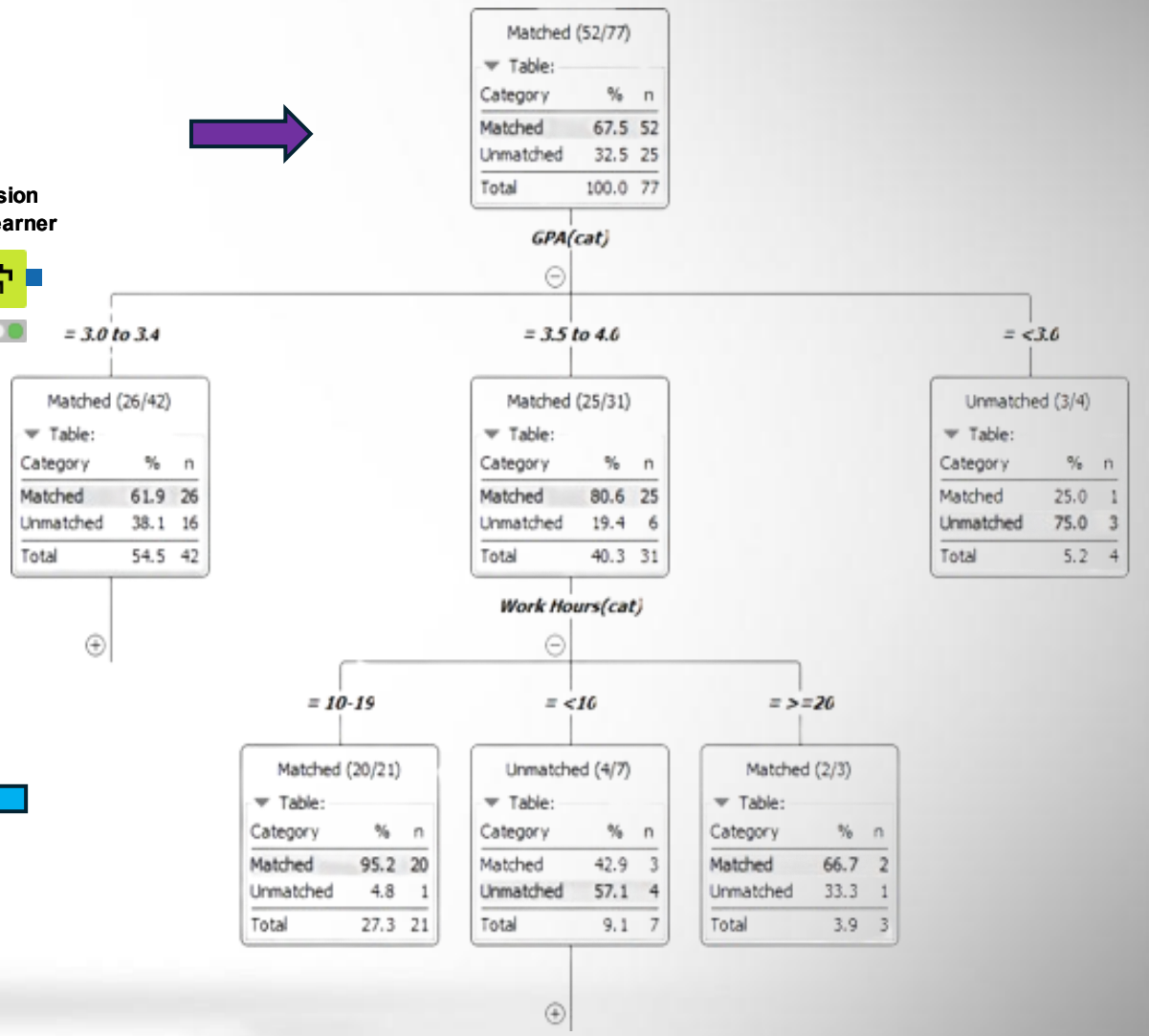
… but no clear increase in rate of residency matching

What Other Factors Are Important in Residency Match?

KNIME Workflow



Decision Tree

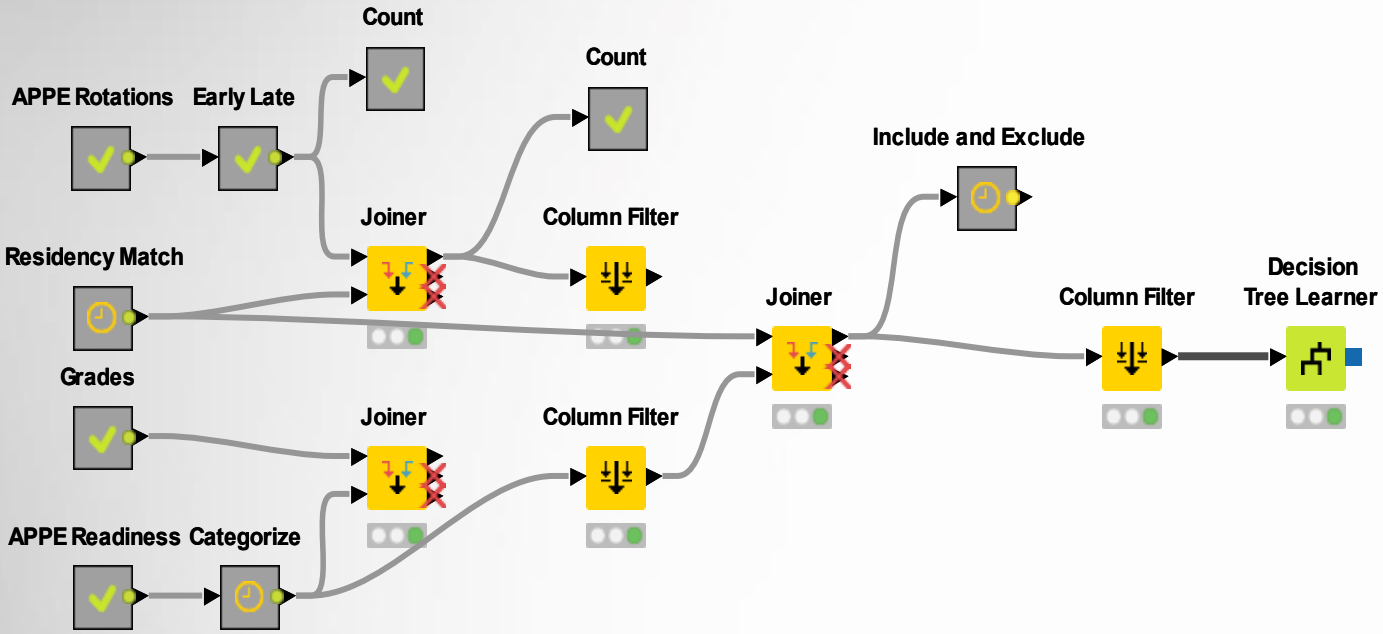


Narrative for Matching to Residency

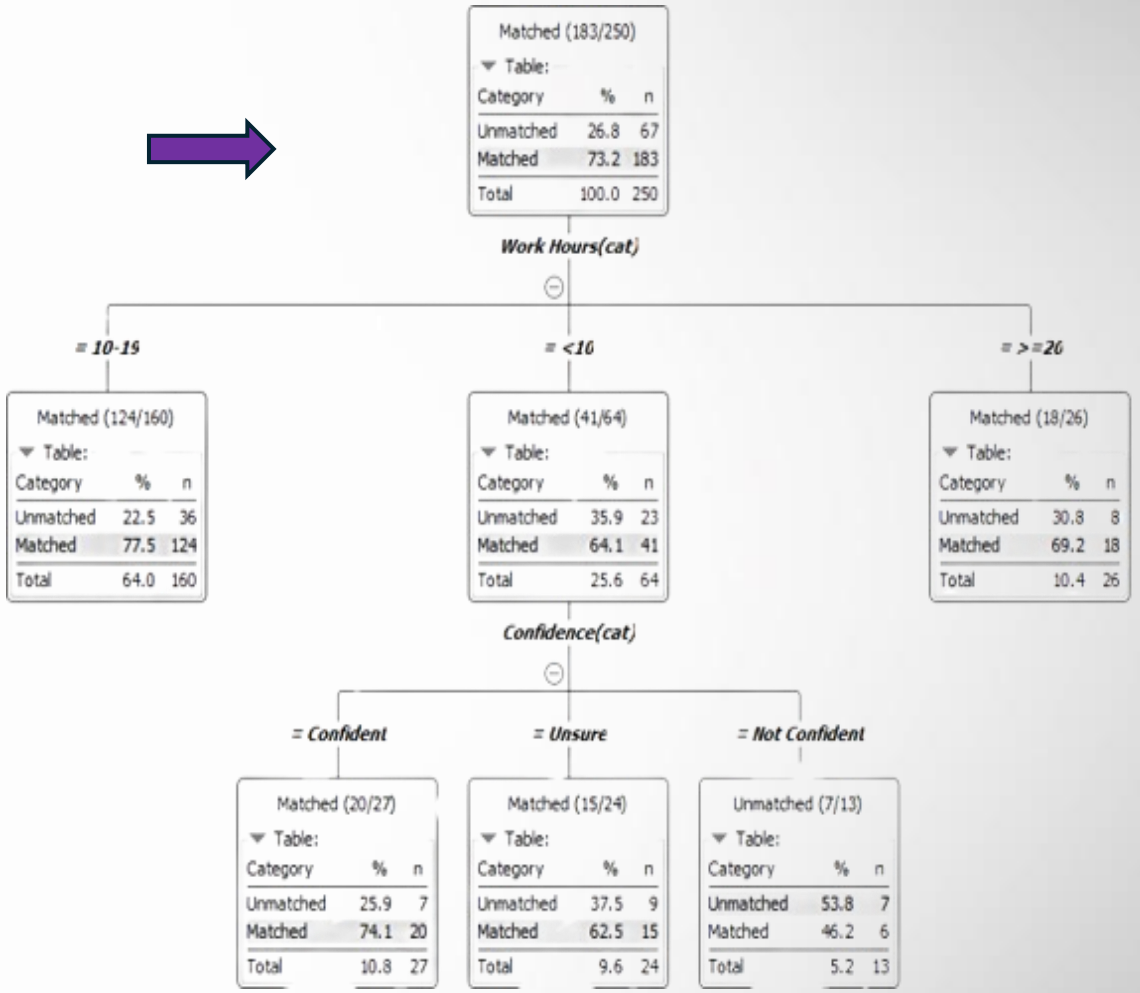
- Class of 2024 only
- Data for 77 students
- Match rate to residency: 67.5%
- Almost everyone has an “Early 701” (not shown here)
- Results are clarified for GPA and work hours
- **Key takeaway: A student who maintains a GPA >3.5 and works an average of 10-19 hours per week is almost certain to match for a residency (>95%)**

What Happens If We Exclude GPA from the Calculation?

KNIME Workflow



Decision Tree

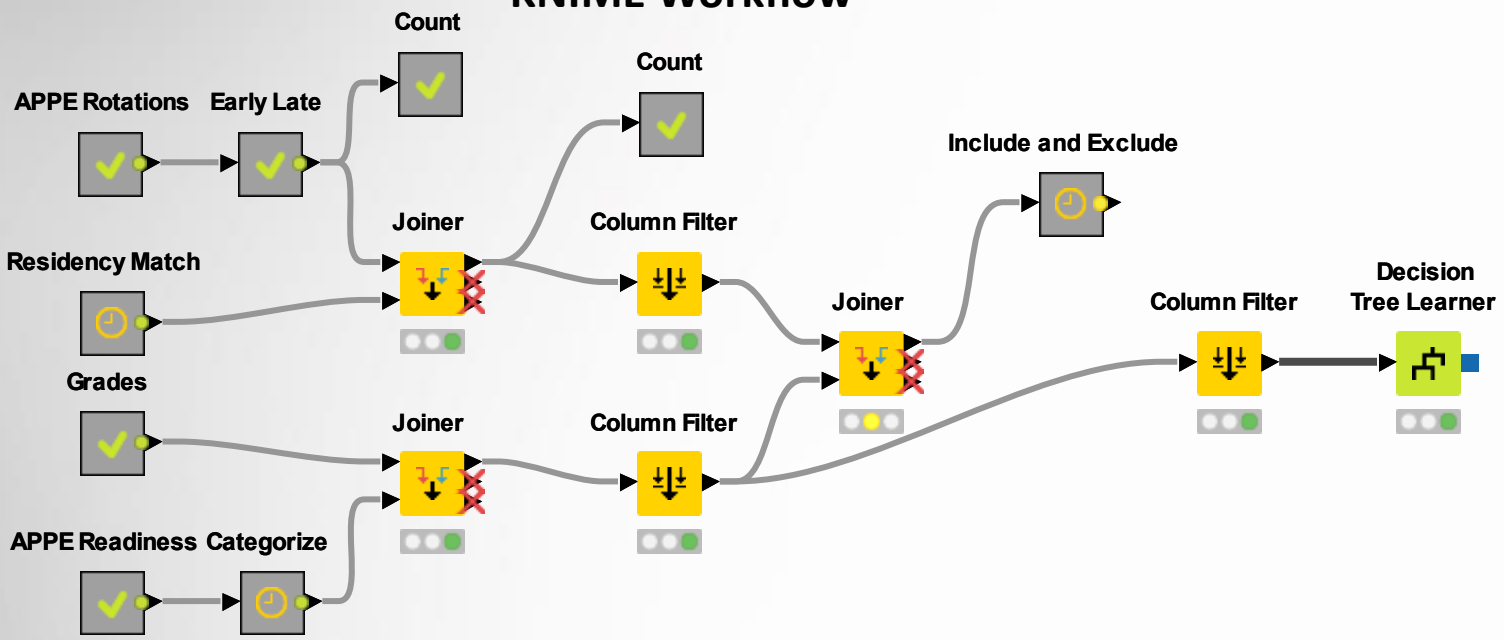


Narrative for Matching to Residency

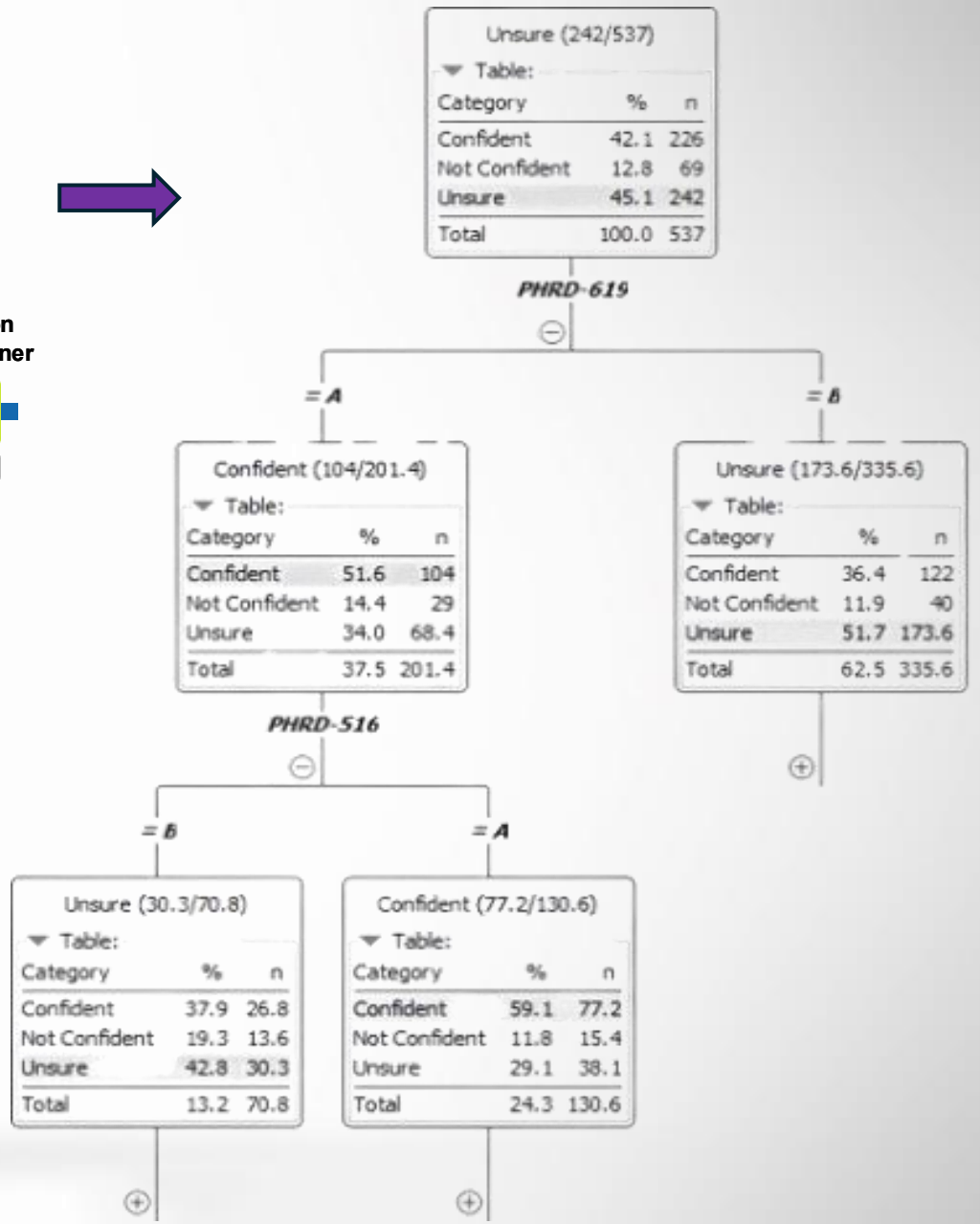
- Classes of 2019 to 2024
- Data for 250 students
- Match rate to residency: 73.2%
- Work hours remains important: 77.5% for 10-19 h
- Confidence is also important for those who work less: 74.1% if confident
- **Key takeaway: Working 10-19 hours per week is positive for residency regardless of GPA, but confidence can compensate. Where does confidence arise from?**

Where Does Confidence Come From?

KNIME Workflow



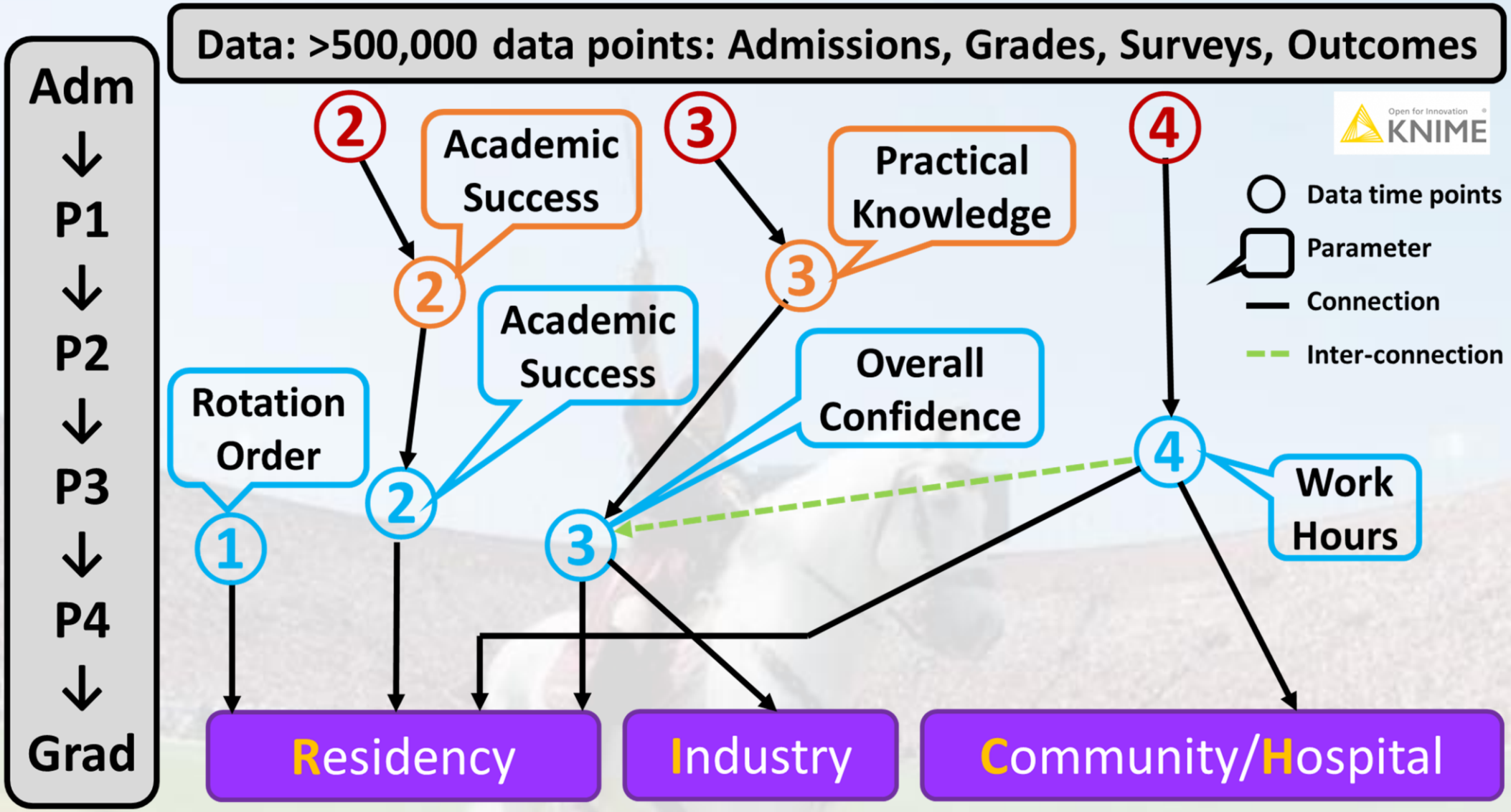
Decision Tree



Narrative for Matching to Residency

- Classes of 2019 to 2024
- Data for 537 students
- Analysis is for confident vs. not confident vs. unsure
- Based on a survey in Spring P3 (APPE Readiness)
- PHRD 619 (Fall P3 cardiology) grade is most important
- 77.2% confident if A in PHRD 619 and PHRD 516 (P1 OTC course)
- **Key takeaway: Success in a practical first year course can lead to later improved performance and increased confidence**

An Overview of AI-SiPS: RIC(H) Outcomes



① Rotation Data
② Grades
③ APPE Readiness
④ Work hours

Take Home Points

- Our **working AI model (AI-SiPS)** is beginning to be identify factors related to student outcomes upon graduating from a four-year PharmD curriculum.
- Identification of factors may **allow schools to modify their program, curriculum, career planning, and other interventions** to optimize students' post graduation outcomes.
- **More data** (e.g. admission and co-curricular involvement) may lead to improved accuracy to predict a student's outcome.
- Future plans are to **share KNIME workflows with other institutions** interested in using AI to support student success.

THANK YOU

Ian Haworth, PhD
ihaworth@usc.edu

Ying Wang, PharmD, APh
wangying@usc.edu

Maryann Wu, EdD
maryann@usc.edu

MONASH University

MONASH PHARMACY AND PHARMACEUTICAL SCIENCES

2024 Pharmacy Education Symposium

VitOOLs: virtual and immersive medical pharmacology

Presented by *Lisa Tee* on behalf of *Dr Rima Caccetta*

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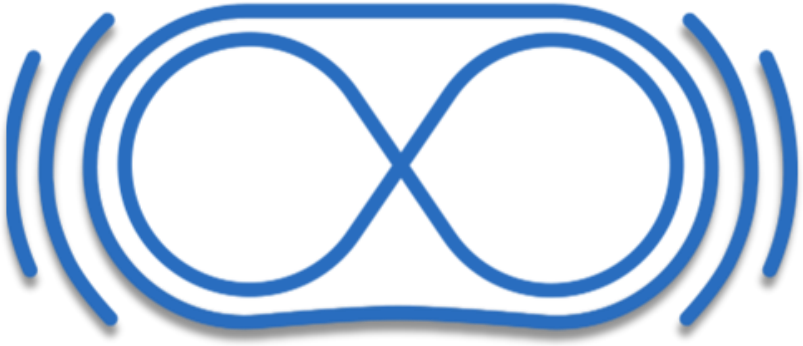

Virtual and Immersive Medical Pharmacology

DR RIMA CACCETTA

CURTIN MEDICAL SCHOOL

FACULTY OF HEALTH SCIENCES

Curtin University

Curtinnovation Prize in Humanities 2021

Curtin University

Problem/Target Consumer(s)

(1) Pharmacology knowledge is expanding but hands on training is constrained.

- Diminished laboratory & tissue availability
- Inadequate placement capacity

(2) Ineffective Clinician to Clinician and Clinician to Patient communication.

- Hastening recovery by empowering patients and improving connectivity
- Globally growing problem complicated by language, broad effects & interactions of medication

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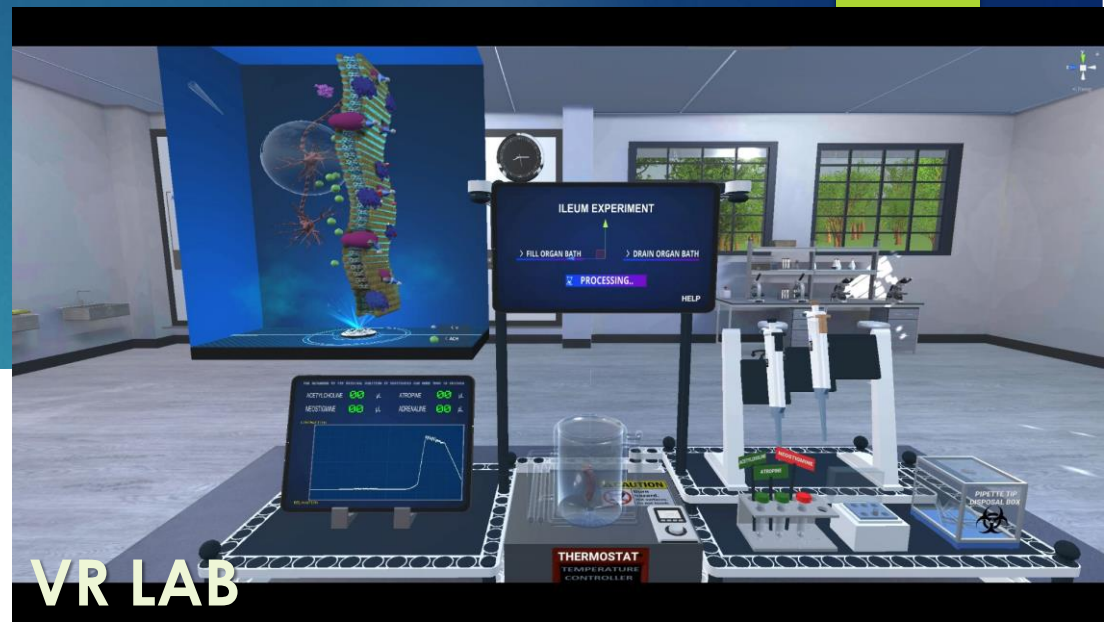
VitOOLs

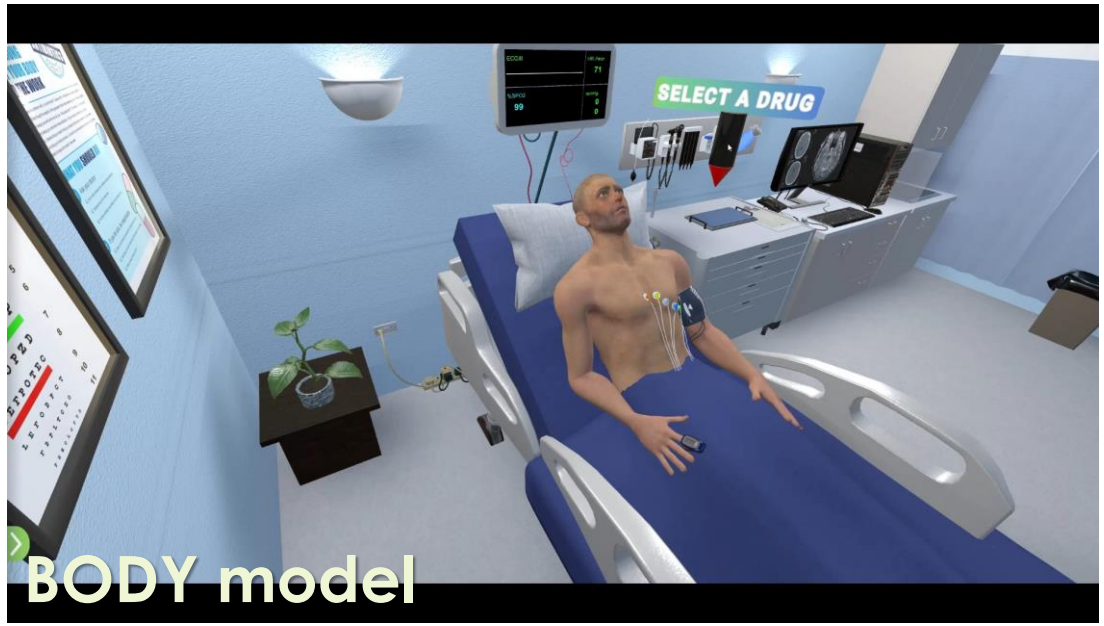
A virtual platform that visually assists learning by explaining **processes** involved in

- medical conditions
- treatment options
- medications

by integrating cellular detail, organs/tissues and body processes.

VitOOLs modules use various settings including **labs, clinics, hospitals and incorporates the visible and the invisible**.





Evaluation of prototypes

Phase 1

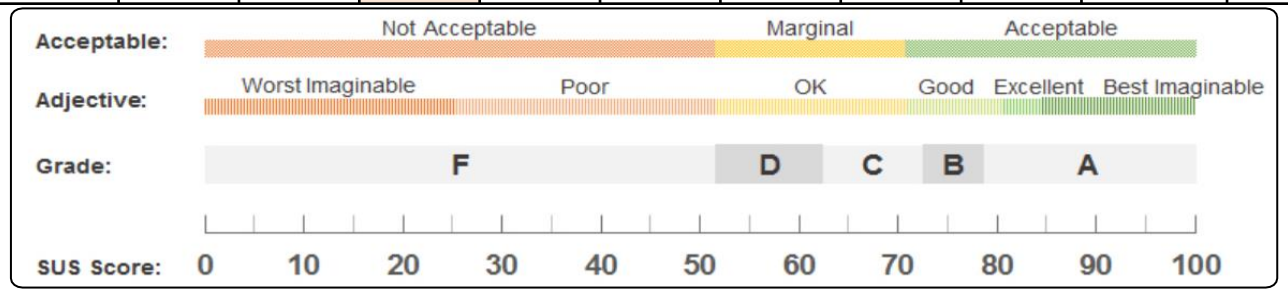
- Piloted in the undergraduate pharmacology and human biology units.
- Students were invited to complete the system usability scale (SUS) survey.

Phase 2

- a one-on-one session conducted with students in a usability study using SUS and emotional response evaluation (ERE) assessment.

Usability Scores of prototypes

SUS Assessment (Average)												
	Desire to use frequently	Unnecessarily complex	Easy to use	Need technical support to use	Functions well integrated	Too much inconsistency	People would learn quickly	Very awkward to use	Felt confident in using	Need to learn a lot of things before use	SUS Score	Adjective Rating
SUS	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**		
Body Model	**3.43**	**1.43**	**4.43**	**2.23**	**3.86**	**1.86**	**4.13**	**1.86**	**4.23**	**1.43**	**79.23**	**Good**
VR Lab	**3.25**	**2.57**	**3.14**	**4**	**4**	**2.29**	**3.29**	**2.86**	**2.86**	**2.57**	**55.63**	**Average**



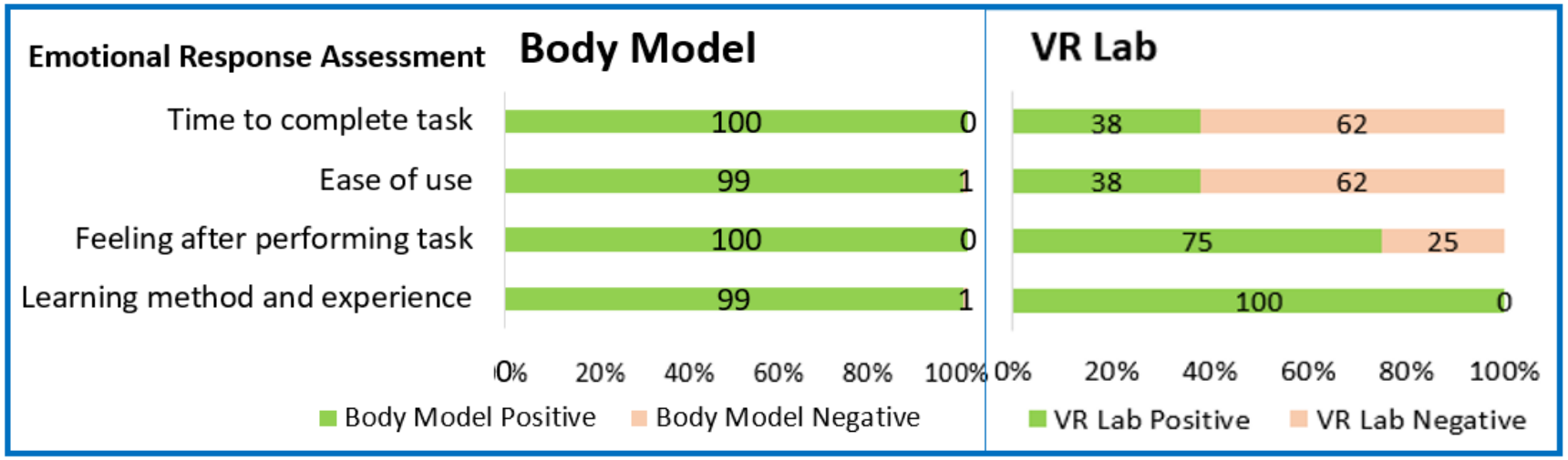
Interpreting SUS scores. Obtained from https://measuringu.com/interpret-sus-score/

The SUS quantitative data indicated a usability score for **Body Model is good and VR LAB is average**.

Learners unfamiliar with VR-headset reported

- difficulty in using controller
- which impacted on time to complete task
- felt overwhelmed

Emotional Response following use



Emotional Response Wordcloud

- Users acknowledged:
  - Prototypes are effective learning tools.
  - Benefits included engagement, repeatability, accessibility advantages, and lower ethical constraints.
- Improvement strategy: (1) tutorial on the use of the VR headset and controller included. (2) On screen version now made available.

Curtin second year unit data 2023

Challenging Biochemical-Pharmacology unit:

- First discipline unit following first year common core.
- Pre-requisite to 3 (out of 4) semester 2 units.
- For in-depth understanding of receptors, drug interaction and cell signalling.

Observations:

- Tutorial attendance increased to 98%
- Student engagement increased
- Significant (26%) increase in pass rate

Evaluations (with NDAs) 2024

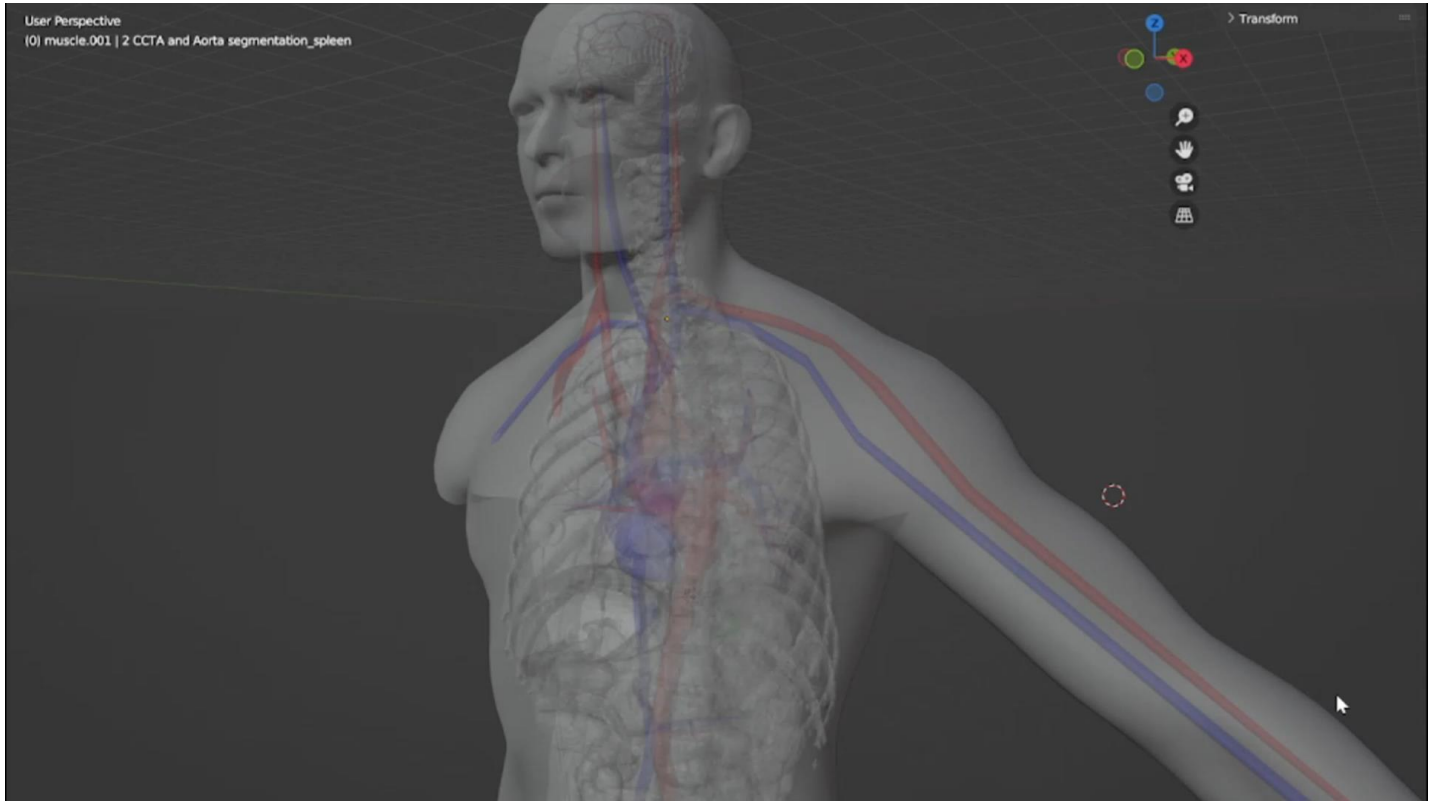
- Curtin (since 2022 and ongoing)

- UWA
- Monash University
- University of Queensland

- ASCEPT – will report on UWA and VR versus On Screen LAB

Virtual Twins

- Single communication platform
- All data in one place
- Visualised, explicit data with reduced misinterpretation
- Connection of symptoms
- Connection of side effects
- Faster diagnoses
- Less trial and error in treatment
  - Healthier, happier people
  - Reduced health burden



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continuing active members

- Dr Rima Caccetta (Founder of VitOOLs; Development Lead).
- A/Prof Lisa Tee (Co-Founder of VitOOLs; Evaluation Lead).

- Prof Zhonghua Sun (Curtin Medical School, Faculty of health Sciences, Medical Imaging Expert).
- A/Prof Aneesh Krishna (School of Elec Eng, Comp and Math Sci (EECMS), Faculty of Science & Engineering, Curtin, Programming and Artificial Intelligence Advisor).

- Mr James Alex (PhD candidate in Mathematics, VitOOLs Programmer & Tech Advisor).
- Mr Limian Ci (PhD candidate in Maths, VitOOLs intern programmer).

+ GROWING NATIONAL & INTERNATIONAL COLLABORATORS

Curtin University

Acknowledgements

- Optus
- Curtin
  - ROC
  - HIVE
  - All Faculties
  - CMS
  - EECMS
- WA Department of Health – Prof Gareth Baynam (Director of Rare Care Centre, Practicing Clinical Geneticist)
- City of Canning

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MONASH PHARMACY AND PHARMACEUTICAL SCIENCES

2024 Pharmacy Education Symposium

Mobile application to assist training and uptake of deprescribing practice: A study exploring perceptions from the aged care workforce

Dr Chang Han Kuo

REPUBLIC POLYTECHNIC
DISCOVER. TRANSFORM. ACHIEVE

Mobile application to assist training and uptake of deprescribing practice: A study exploring perceptions from the aged care workforce

Chong-Han Kua[1], Ira Syukrina[1], Ying Tong Ng[1], Sharlynn Danisha[1], Melody Loh[1], Chantel Ng[1], Bryan Rai[1], Garion Goh[2], Sok Kem Tay[3]
[1]School of Applied Science, Republic Polytechnic, Singapore
[2]School of Technology for the Arts, Republic Polytechnic, Singapore
[3]School of Infocomm, Republic Polytechnic, Singapore

Correspondence email: kua_chong_han@rp.edu.sg

Introduction

Polypharmacy in Older Adults: A growing concern

More prevalent in older adults due to an increase in chronic diseases

Challenges: Pharmacodynamics and Pharmacokinetics changes make prescribing more difficult

- Inappropriate drug
- Inappropriate dose
- Unnecessary drug

- **Adverse events**
- **Pill burden**
- **Falls**

Mobile application to assist training and uptake of deprescribing practice:
A study exploring perceptions from the aged care workforce

Photo credit: iStock.com/MJ_Prototype

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Deprescribing

The process of withdrawing, substituting or tapering inappropriate medication can:

- Reduce adverse effects
- Decrease fall risk and hospitalizations
- Reduce polypharmacy and medication cost

Current barriers in the nursing homes:

- Uptake of deprescribing practice is low
- Medical staff not familiar with the process or find the process of referring to resources too tedious

A mobile app can assist in training and practice.

Mobile application to assist training and uptake of deprescribing practice: A study exploring perceptions from the aged care workforce

Objectives

To develop a sustainable deprescribing application to improve patient's outcomes, we need to adopt the principles of **user-centered design**.

The objectives of this study are to explore end-user perceptions and to assess the requirements and preferences for a deprescribing application.

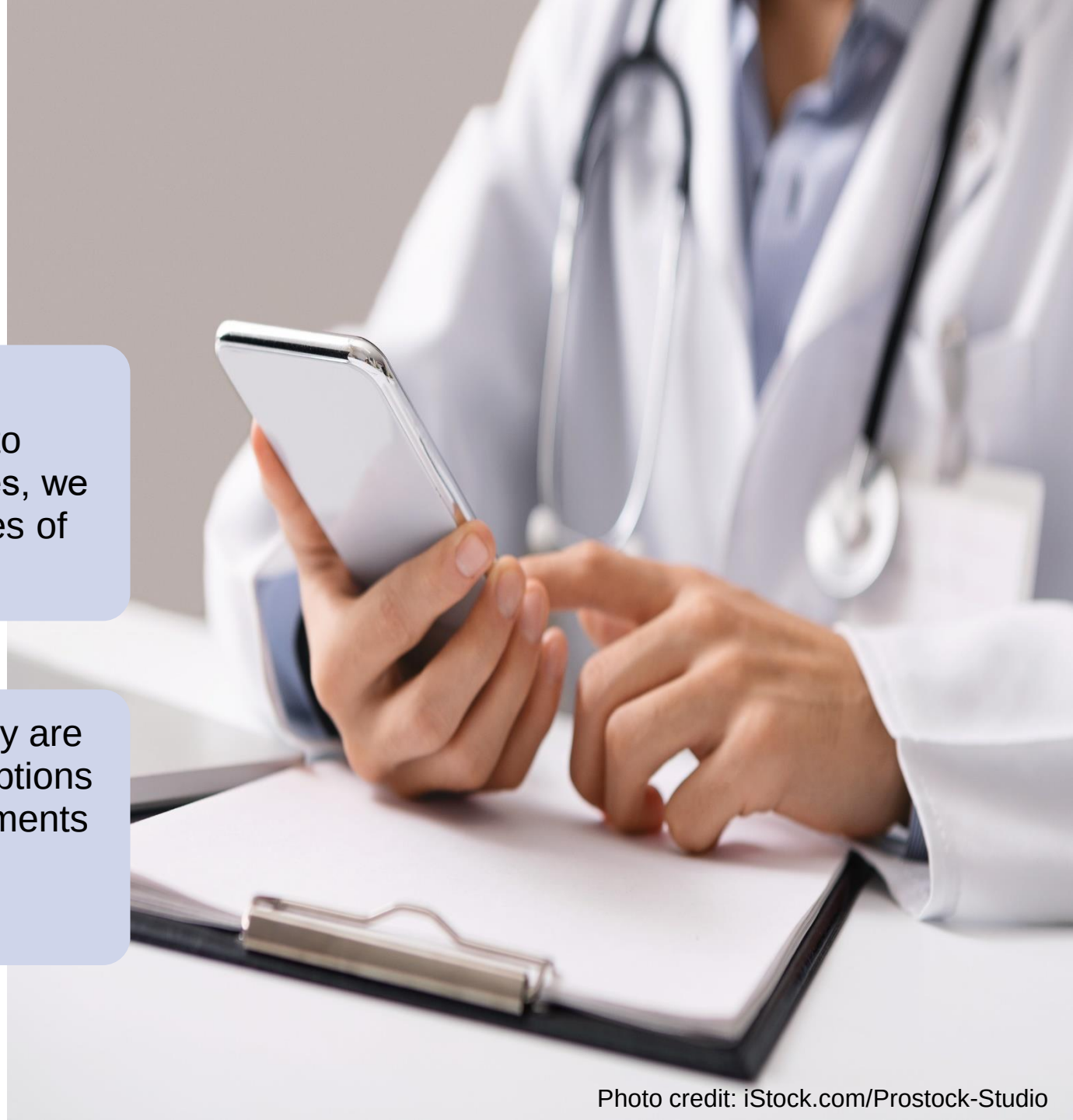

Photo credit: iStock.com/Prostock-Studio

Methodology

A survey was developed to explore the perception of the nursing home workforce toward the use of mobile applications for deprescribing.

- Literature review was done on the following electronic databases: Google Scholars and PubMed.
- Search terms included ‘deprescribing app’, ‘prescribing app’, ‘mHealth’, and ‘app preference’ for papers published in the last 10 years.
- 23 papers are assessed to be relevant. The deprescribing app survey questionnaire was developed after reviewing the papers’ findings.
- Our survey was divided into major categories: 1) medical aspect, 3) technical aspect, and 4) the functional aspect of the application.
- The survey was validated by 5 experts comprising of doctors and pharmacists.

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Methodology

An online Likert scale survey was conducted with healthcare professional from aged-care facilities (nursing homes) in Singapore, involved in the prescribing, dispensing, administration and monitoring of medications.

Doctors, pharmacists and nurses with at least 6 months of experience in the aged care facilities were recruited.

Informed consent was sought, and the survey is anonymous.

The targeted sample size is 40 participants from around three nursing facilities.

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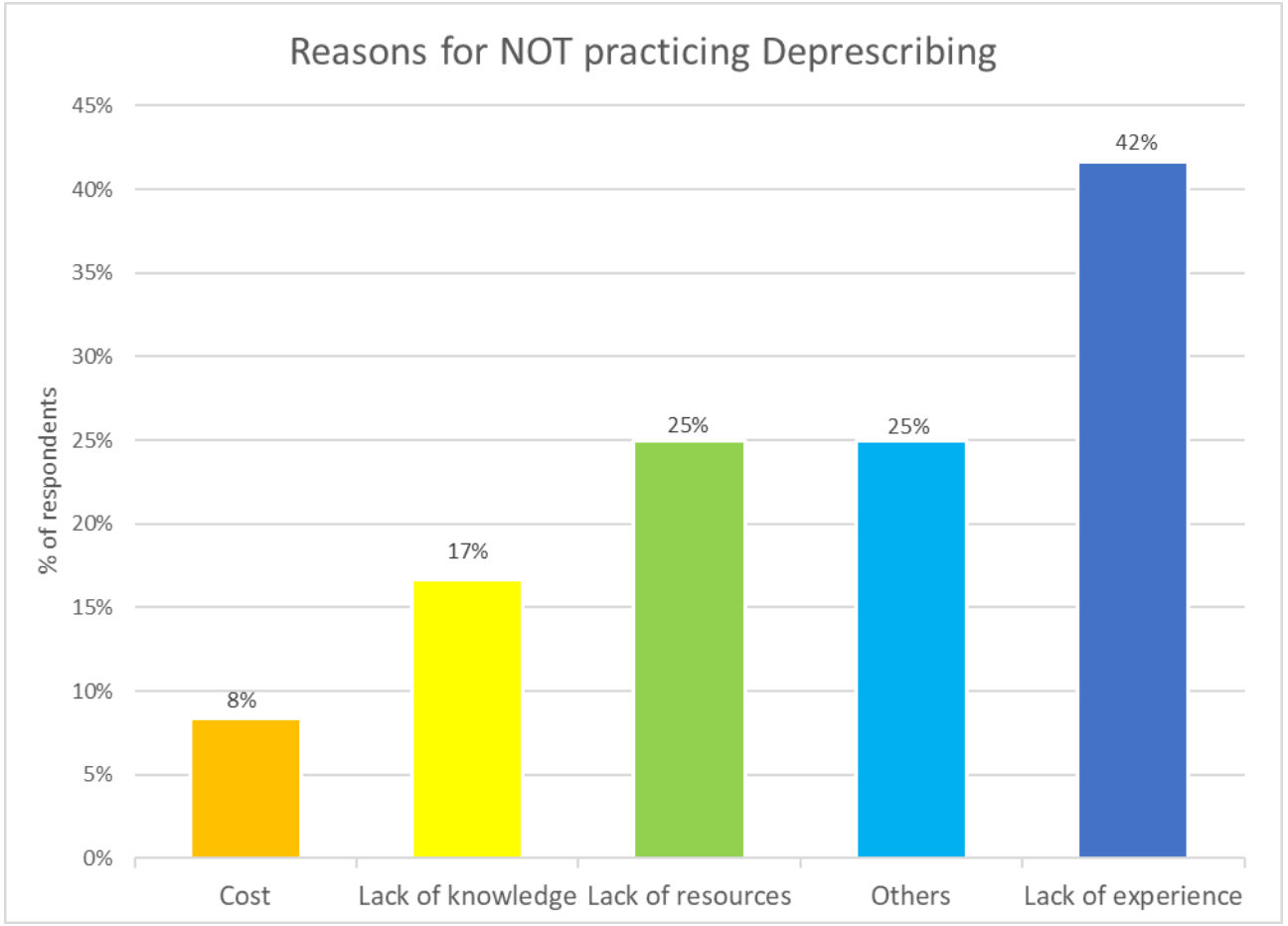
Results

Forty-five participants, comprising of 24 (53%) aged-care nurses, 16 (36%) pharmacists and 5 (11%) doctors completed the survey. The main reasons for not deprescribing are lack of experience and resources, but most (91.1%) are receptive to using an application to aid in deprescribing.



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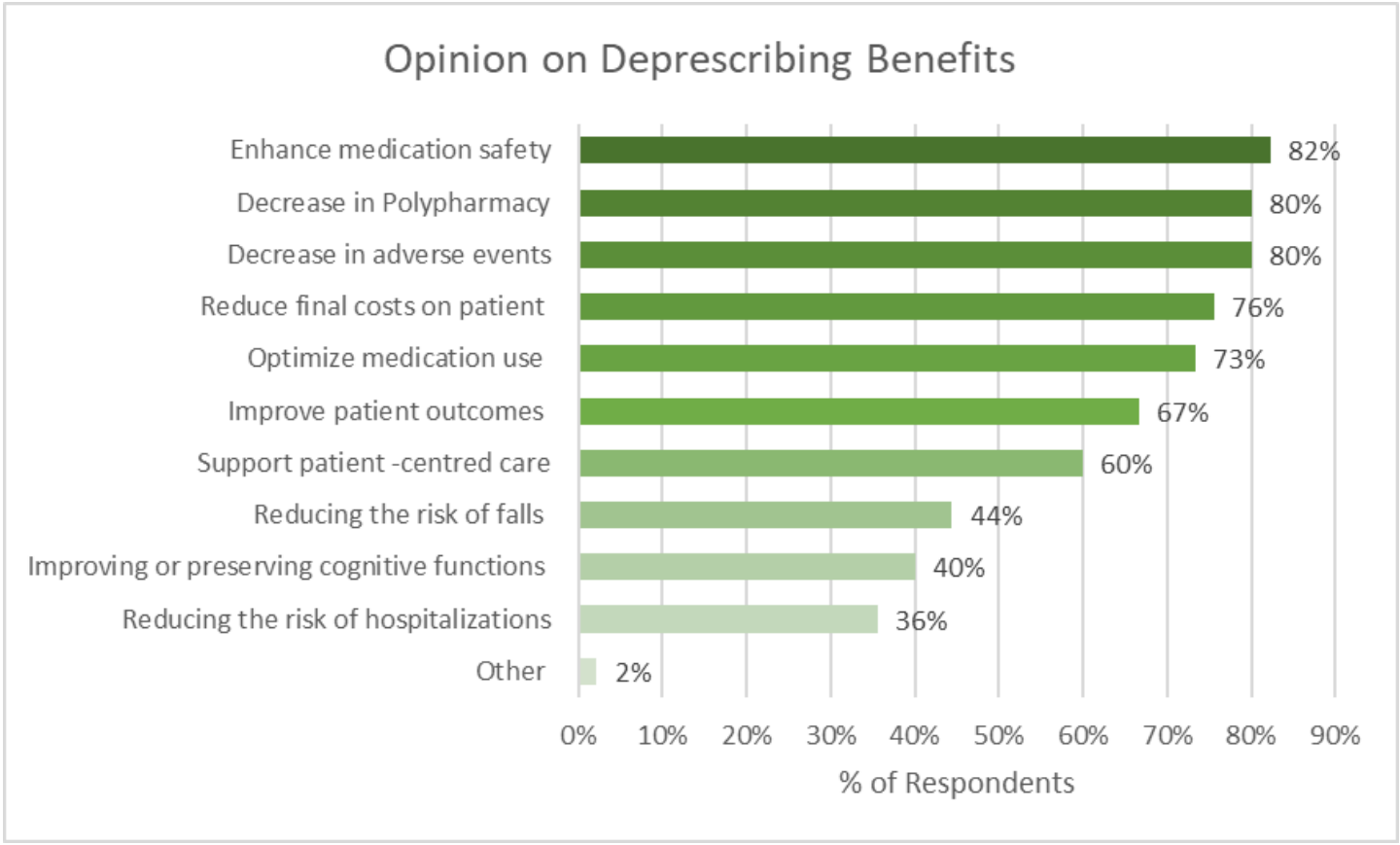
Results

Most participants believed that deprescribing can reduce polypharmacy and adverse events while enhancing medication safety.

Most did not feel that it can reduce hospitalization and the risk of falls, or can improve cognition.



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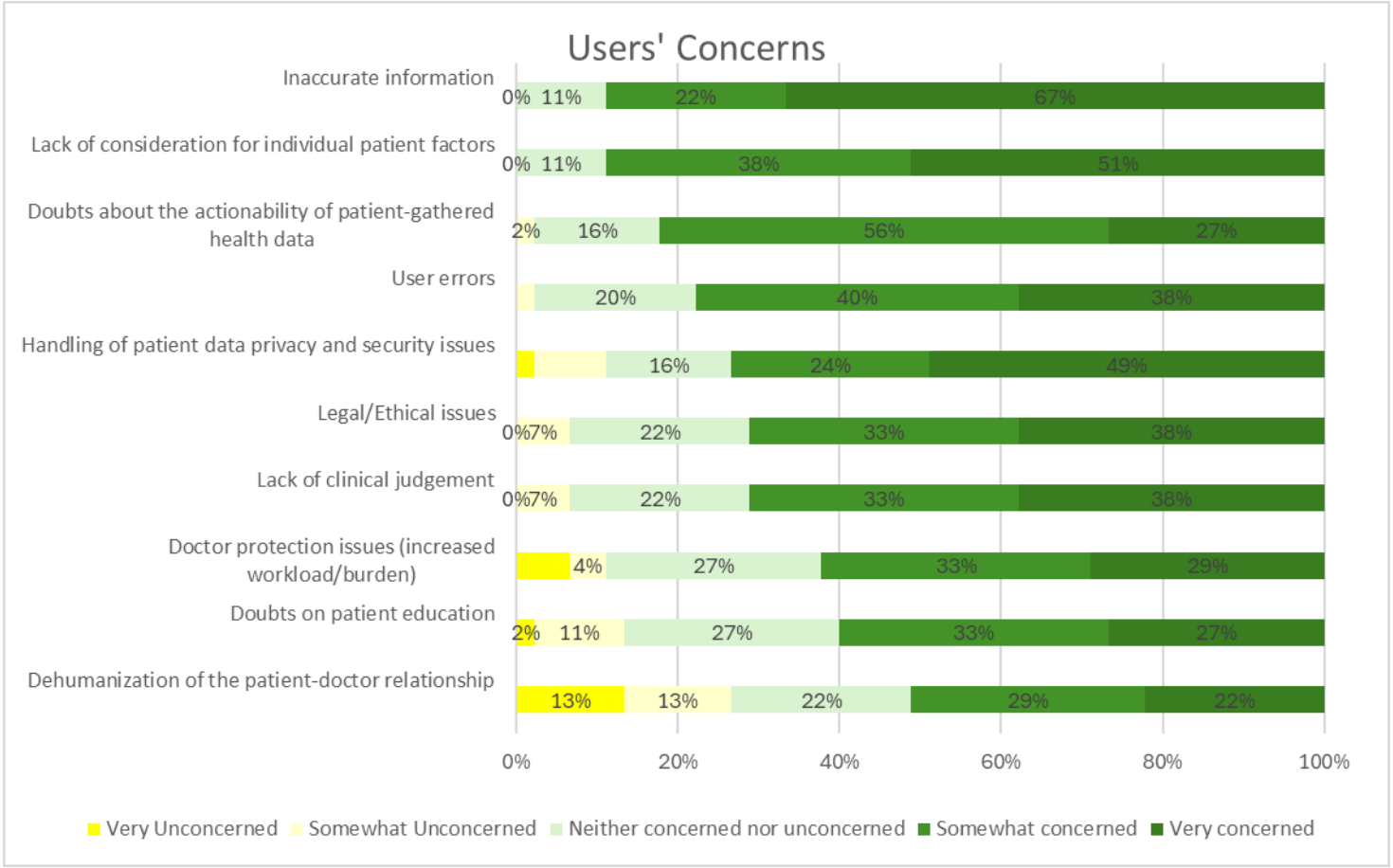
Results

The top functions that the participants wished to see in the application include evidence-based deprescribing guide, medication management, and communication tools.

The main concerns when using a deprescribing application include data privacy and security issues, inaccurate information, lack of consideration for individual patient factors, and lack of clinical judgement.



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Conclusion

In this study, pharmacists and other healthcare professionals highlighted the need for a deprescribing application, particularly in settings with limited deprescribing experience and educational resources. However, end-users' preferences and concerns should be prioritized when developing such applications.

By employing a user-centered design approach in application development, we can enhance the adoption of deprescribing practices among nursing home healthcare professionals. The application will ensure sustainable deprescribing practice within healthcare professionals' workflows, and provide a scalable model of care for older adults in nursing homes.

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2024 Pharmacy Education Symposium

Virtual Advanced Pharmacy Practice Experiences increase international opportunities for more pharmacy students

Dr Melody Ryan

College of Pharmacy | Beyond the Script

Virtual Advanced Pharmacy Practice Experiences Increase International Opportunities for More Pharmacy Students

Melody Ryan, PharmD, MPH

In Person Experience

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Shoulder to Shoulder Global Virtual APPE

- Transformed a previously existing international APPE into a virtual experience
- Circumvents the need to travel internationally to complete a global health clinical experience
- 5 student participants

Schedule

Week 1	8:00 - 10:00 AM	Orientation: Meet clinic staff, expectations, activities, protocols, discussion of potential projects. (Craig, Pablo, Melody).	8:00 - 9:30 AM	Virtual presence in Dr. Cristian consult	8:00 - 9:30 AM	Virtual presence in Dr. Cristian consult	8:00 - 9:30 AM	Virtual presence in Dr. Cristian consult	8:00 - 9:30 AM	Virtual presence in Dr. Cristian consult
	10:00 AM - 12:00 PM	Readings: CIA: Ecuador Country Profile, My Life Elsewhere; best practices for working with an interpreter Videos: STSG video; National Healthcare system of Ecuador video; working with an interpreter	9:30 AM - 11:30 AM	Follow-up research and/or review of patient cases	9:30 AM - 11:30 AM	Follow-up research and/or review of patient cases	9:30 AM - 11:30 AM	Follow-up research and/or review of patient cases Project work	9:30 - 11:00 AM	Follow-up research and/or review of patient cases Project work
									11:00 AM - 12:00 PM	Health System in Ecuador: overview and challenges. (Cristian, Pablo)
			12:30-1:00 PM	Review of cases with Dr. Cristian	12:30-1:00 PM	Review of cases with Dr. Cristian	12:30-1:00 PM	Review of cases with Dr. Cristian	12:30-1:00 PM	Review of cases with Dr. Cristian
	1:00 - 3:30 PM	Reading: A primary care system to improve health care efficiency Videos: Virtual tour of the community; Political Climate of Ecuador	1:00 - 3:00 PM	Reading: https://www.migrationpolicy.org/article/welcome-wears-thin-for-colombians-ecuador Videos: STSG History	1:00 - 4:00 PM	Project work	1:00 - 3:00 PM	Project work	1:00 - 2:00 PM	Reflection: what are the shared challenges you find in Ecuador and the US regarding healthcare? (Melody)
	3:30 - 4:30 PM	Discussion: resources on primary health care in Ecuador and differences with the US. (Cristian)	3:00 - 4:00 PM	Discussion: The community and political atmosphere (Craig, Pablo, Mercedes)			3:00 - 4:00 PM	Discussion: inmigration and COVID-19, recent impacts on healthcare (Mercedes, Carlos)	2:00 - 4:00 PM	Project work

- Daily clinic consultations
  - Interpreter provided as needed
- Topic discussions with staff or faculty
- Readings/viewings
- Presentations
- Longitudinal project
- Weekly reflections

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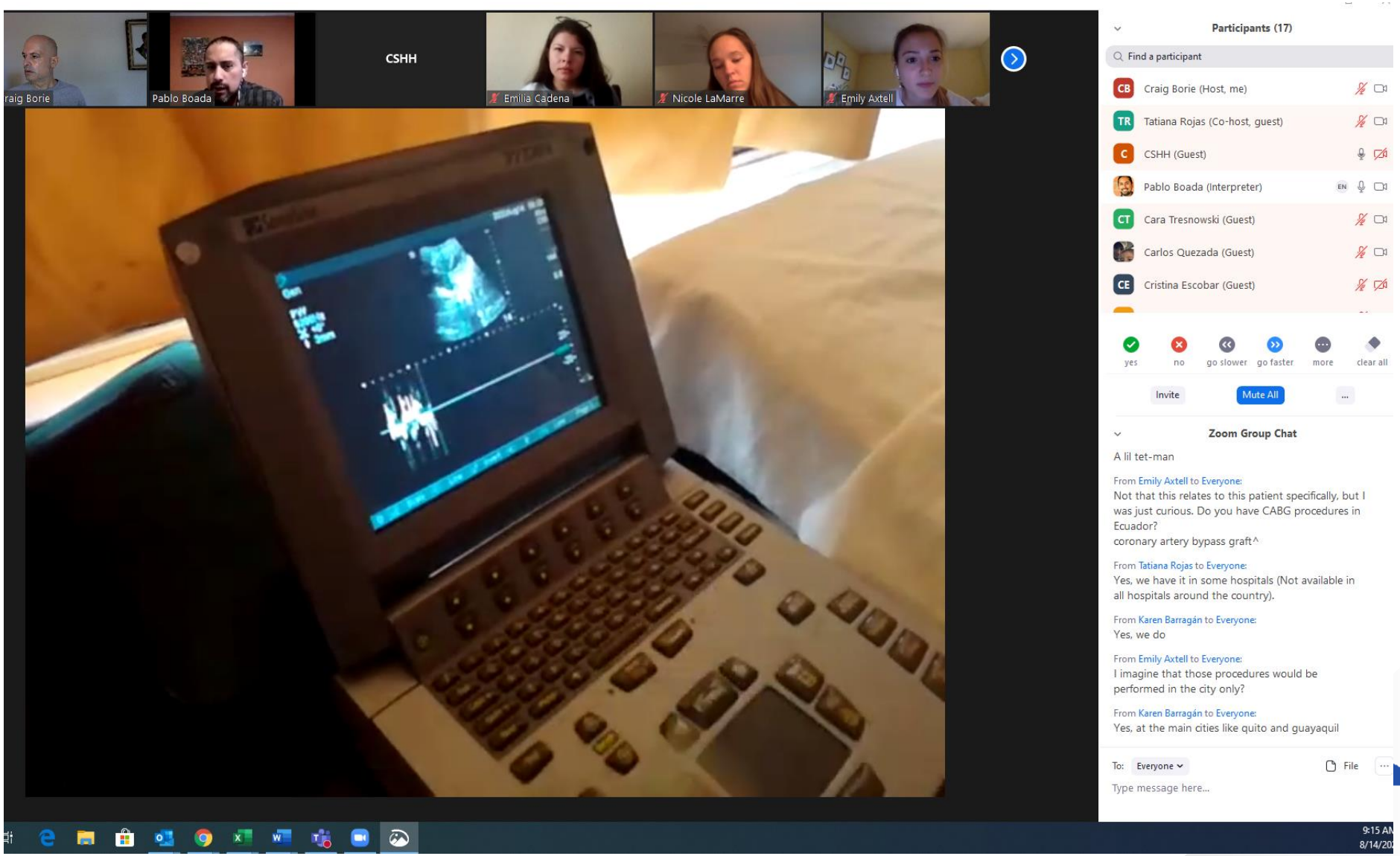
Patient Consults



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Discussions with Team

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Discussions with Community

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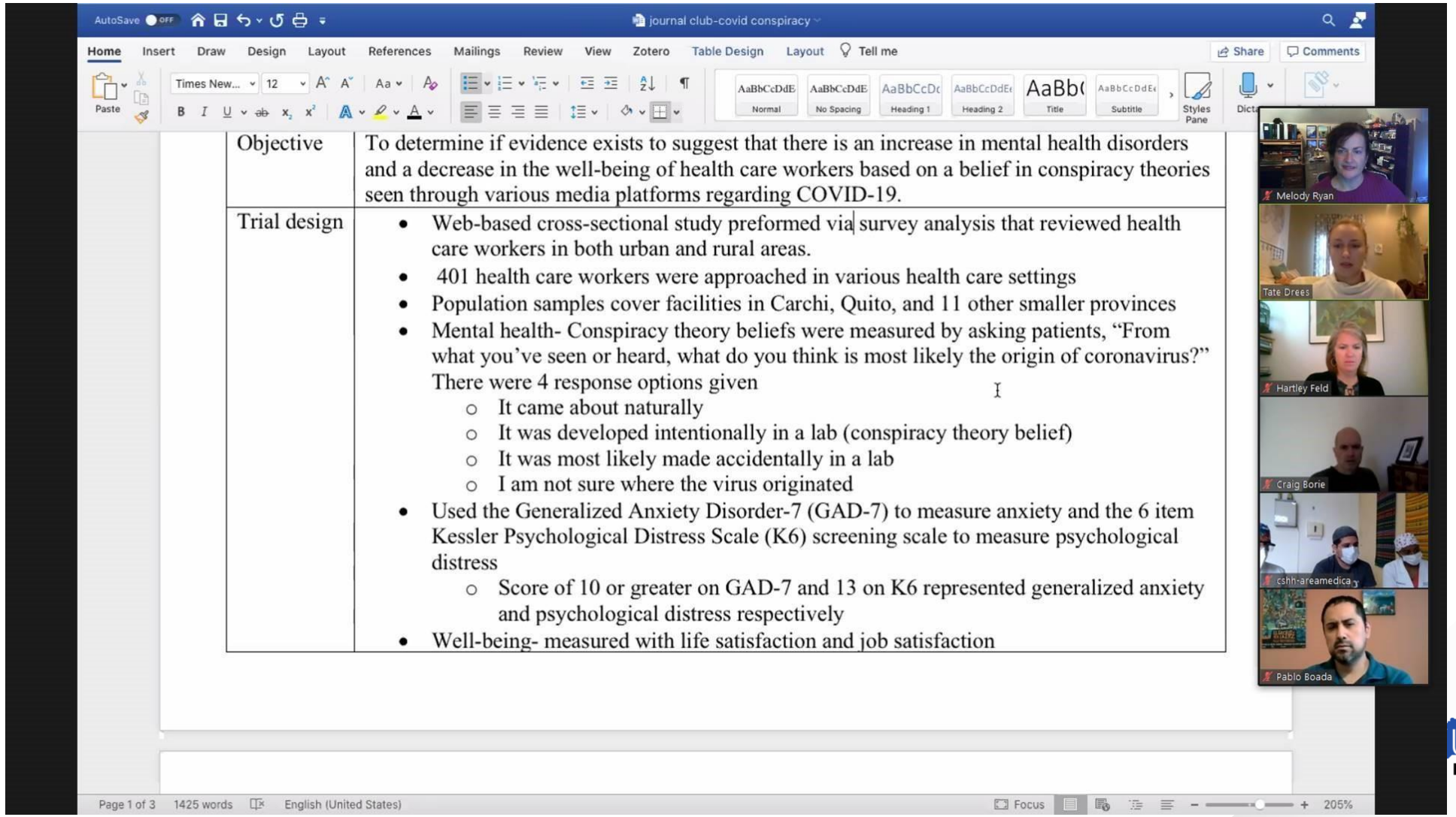
Student Presentations



journal club-covid conspiracy

Objective	To determine if evidence exists to suggest that there is an increase in mental health disorders and a decrease in the well-being of health care workers based on a belief in conspiracy theories seen through various media platforms regarding COVID-19.

Trial design	• Web-based cross-sectional study preformed via survey analysis that reviewed health care workers in both urban and rural areas.
	• 401 health care workers were approached in various health care settings
	• Population samples cover facilities in Carchi, Quito, and 11 other smaller provinces
	• Mental health- Conspiracy theory beliefs were measured by asking patients, "From what you've seen or heard, what do you think is most likely the origin of coronavirus?" There were 4 response options given
	  ○ It came about naturally
	  ○ It was developed intentionally in a lab (conspiracy theory belief)
	  ○ It was most likely made accidentally in a lab
	  ○ I am not sure where the virus originated
	• Used the Generalized Anxiety Disorder-7 (GAD-7) to measure anxiety and the 6 item Kessler Psychological Distress Scale (K6) screening scale to measure psychological distress
	  ○ Score of 10 or greater on GAD-7 and 13 on K6 represented generalized anxiety and psychological distress respectively
	• Well-being- measured with life satisfaction and job satisfaction

Melody Ryan
Tate Drees
Hartley Feld
Craig Borie
cshh-areamedica
Pablo Boada

Page 1 of 3 1425 words English (United States) Focus 205%

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Cultural Buffet

Additional Content

Welcome to the cultural buffet, where you can find additional activities and resources to explore Ecuadorian culture outside of scheduled brigade activities. Take a look and let us know what you find!

Language Skills

- Sign up for Duolingo to practice Spanish language skills
- If you would like some one-on-one instruction, Maria Ce Ruiz can provide those via a video link. She charges $8/hour. As well as being a professional Spanish instructor, Maria Ce works with the Hombro a Hombro Foundation in Ecuador and often helps with the logistics of the brigade. Her email is

  mariace997@gmail.com

Cooking Skills

- Check out Anthony Bourdain's *No Reservations* episode in Ecuador
- This website has several Ecuadorian recipes to try
- Here are some short cooking demonstration videos:
  - Seco de Pollo Recipe (Ecuadorian Chicken Stew)

Shoulder to Shoulder Global Virtual APPE

Student Activity	Total
Virtual consultations	60
Video assignments	20
Reading assignments	17
Topic discussions	15
Patient care progress notes	6
Reflective discussions	6
Disease state presentations	2
Journal clubs	2
Longitudinal project	1

“This experience provided large varieties of learning opportunities including not only insight into medicinal therapies in another country, but also how cultures outside of the United States have variables that go into medicine that differ from those seen to here. I learned a lot about the disparities in health in Ecuador with some of the biggest being cost and access to health care. Most parts of the rotation went well. I was assigned weekly presentations including journal club topics and disease state presentations which all went smoothly and the staff here in the United States and in Ecuador were able to ask questions and discuss the topics I presented on. Overall, I found that I was not having to spend too much time on screens which was something I was concerned about in the beginning. It is a virtual rotation, but there is down time that is there to give the eyes a break. The rotation is designed to help you learn about other cultures, and I made sure to take full advantage of that!”

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What did I learn?

- So much!
- Home visits – what they are, who they're for, and how COVID has affected them
- One Health – the connection between the health of humans, animals, and the environment
- Tsáchila community – history, health disparities, and culture
- Global health ethics – First, do no harm.
- COVID and how it has specifically affected the children of Santo Domingo – education, socialization, violence, and food insecurity

Evaluations and Conclusions

- Students rated preceptor and experience highly
- Average ratings similar to in-person experience and overall APPE ratings

- A virtual international APPE can be a rich and rewarding experience

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Why do virtual experiences?

- Travel restriction
- Access remote populations
- Support diversity, equity, and inclusion missions
- Financial limitations
- Place-bound students
- Environmental concerns

College of Pharmacy

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Virtual Advanced Pharmacy Practice Experiences Increase International Opportunities for More Pharmacy Students

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2024 Pharmacy Education Symposium

Methodological review on digital health education and training development for healthcare professionals

Afina Nur Fauziyyah

School of Pharmacy, Department of Practice and Policy

Methodological review on digital health education and training development for healthcare professionals

Afina Nur Fauziyyah [1], **Ian Bates** [1]
[1] Department of Practice and Policy, School of Pharmacy, University College London

Image source: Delloite UK

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The 11th Monash University Pharmacy Education Symposium
Oral Paper Session 4: Role of digital health in pharmacy education and practice / Generative artificial intelligence in pharmacy education
Tuesday, 9th July 2024

Background and objective

Digital health and health workforce

WHO Global Strategy on Digital Health

Strengthen governance for digital health at global, regional and national levels:

Promote and facilitate digital health competencies in the education and training curricula of all health professionals and allied workers

Objective

This study aims to identify the methods used in developing digital health education and training competencies for health workforce.

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Methods

Review protocol

- Joanna Briggs Institute (JBI) Evidence Synthesis
- Preferred Reporting Items for Systematic Reviews and Meta-Analyses for scoping review (PRISMA-Scr)

Inclusion criteria

- Participants/population: health workforce (healthcare professionals)
- Concept: education and training; competencies
- Context: digital health
- All studies published up till April 24, 2023

Exclusion criteria

- Abstracts (no full text), study protocol, opinion article.
- Article not in English

Search strategy

- Databases: MEDLINE, Pubmed, EMBASE, CINAHL Plus,Health Management Information Consortium, Social Policy and Practice, Educational Administration Abstracts (ERIC).
- Grey literature: Google, Google Scholar, Health organisations websites (WHO, FIP, AFPC, NHS, Health Education England), Prospero
- Search strategy was peer-reviewed by UCL School of Pharmacy librarian.

Screening & data extraction

- Preliminary title and abstract screening
- Full text review based on inclusion criteria
- Data extraction using piloted form

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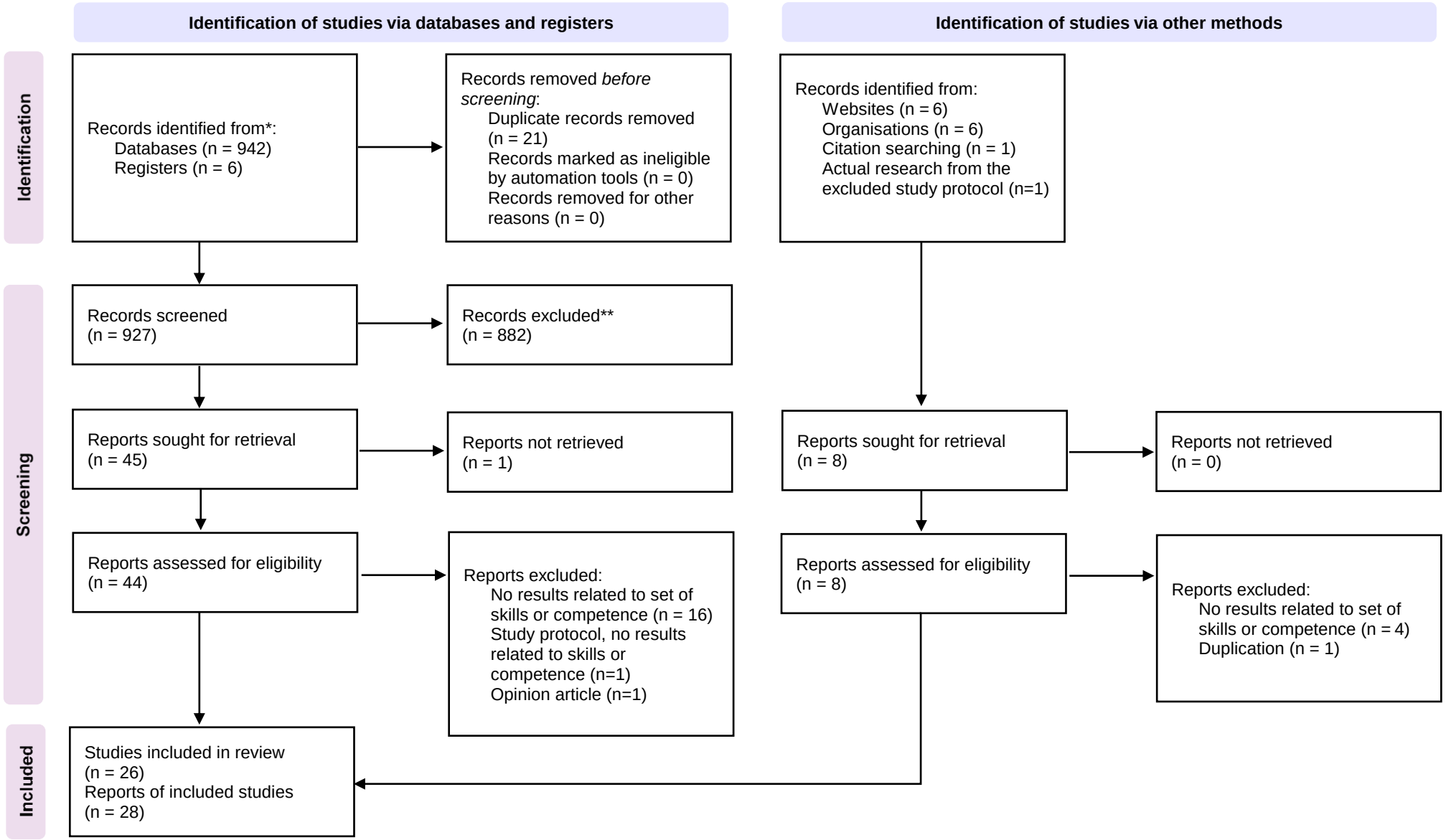

Results

- Total included studies: **28 studies**
- Total number of behaviors relevant to digital health competencies: **456 behaviors**

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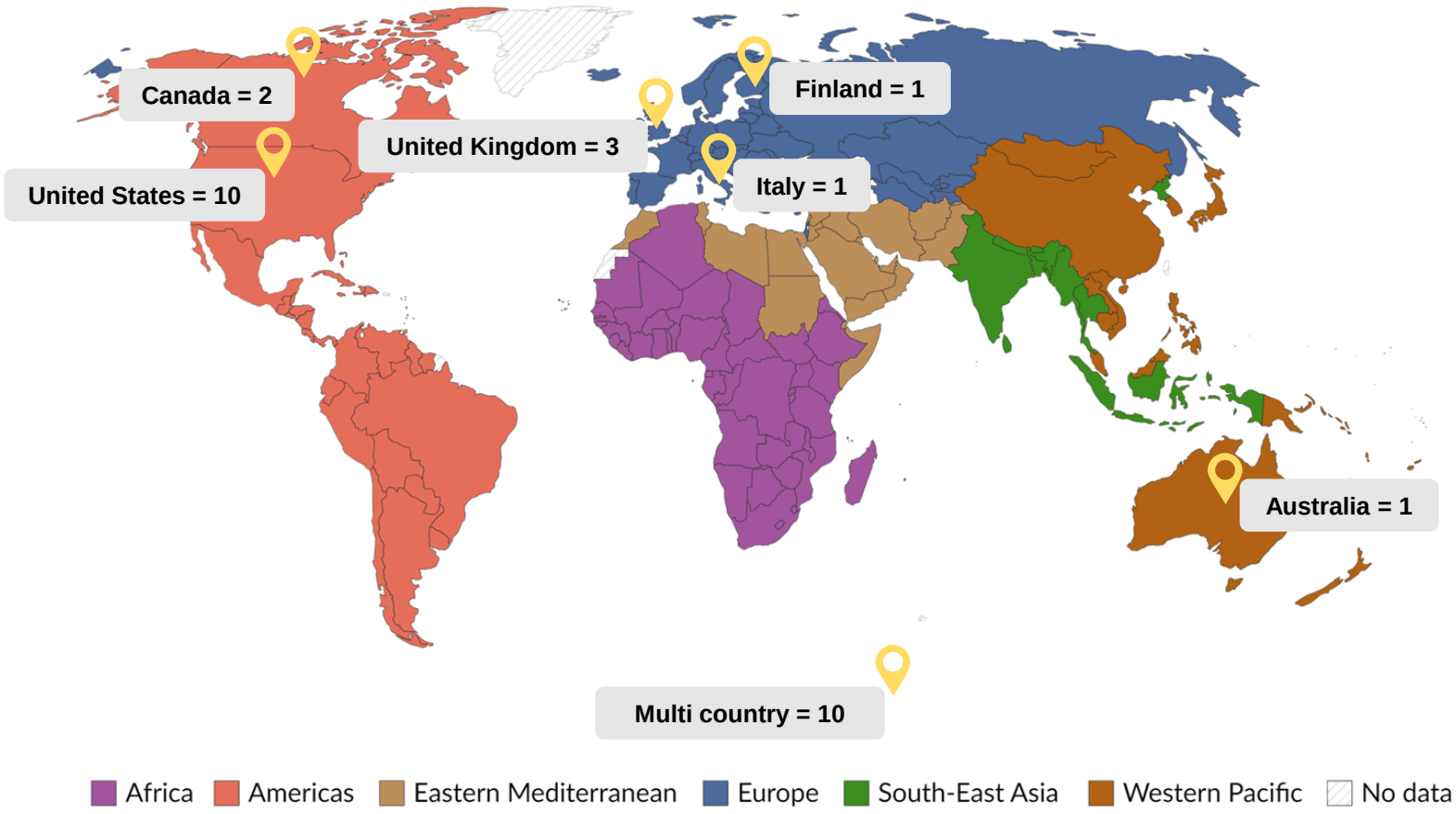
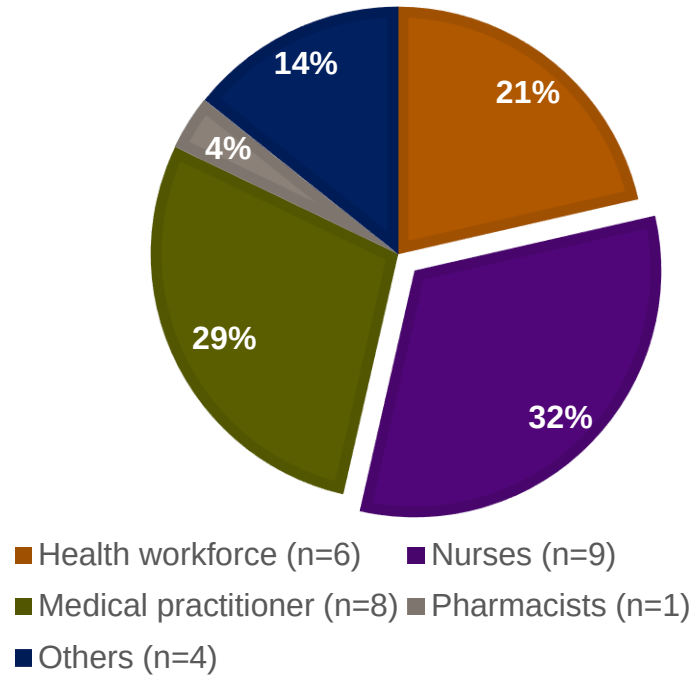
Details of included studies

Study population





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Study methods

Literature review: 16

- Systematic review
- Scoping review

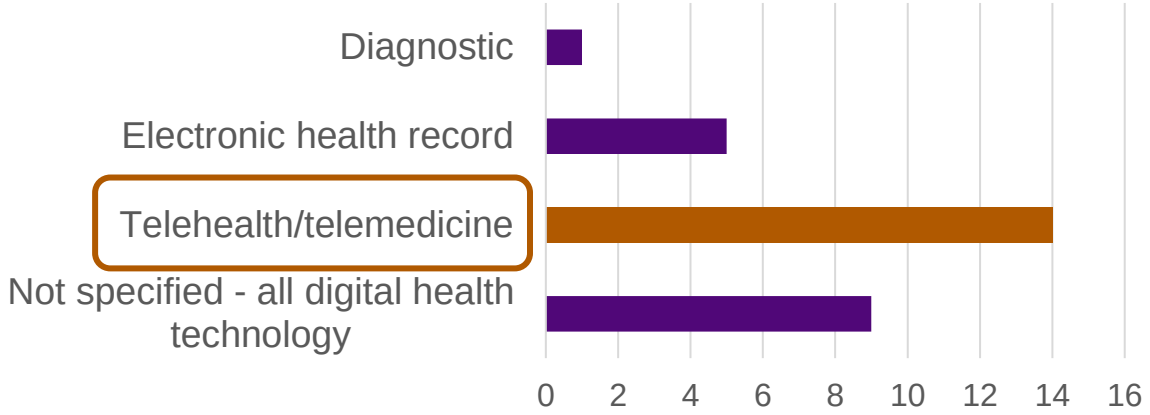
Qualitative method: 14

- Focus group discussions; expert discussion
- Text-based survey
- Interview
- Case study

Quantitative method: 5

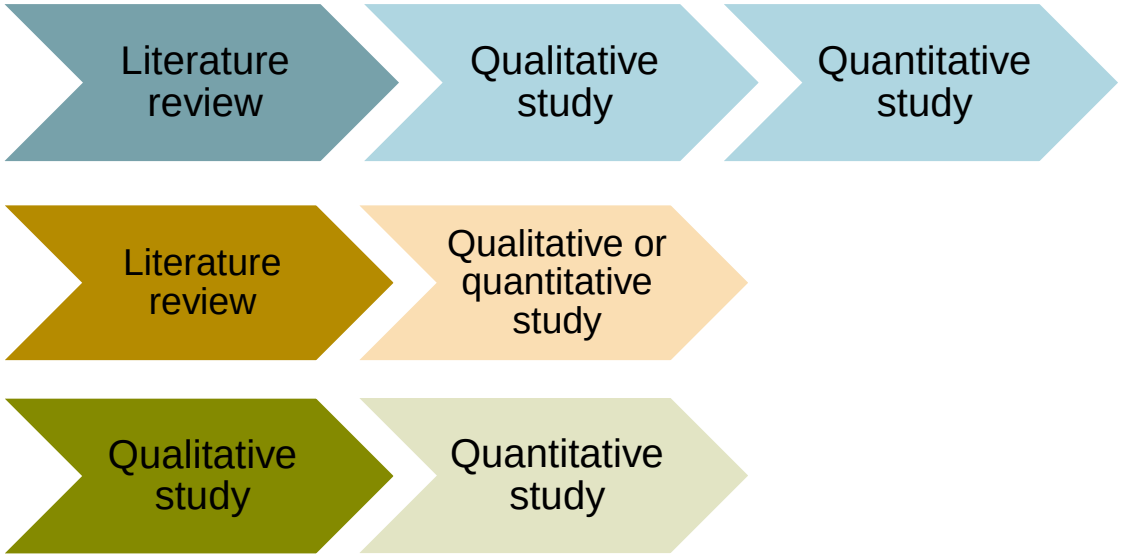
- Online survey; using Likert scale

Technology-related focus



Discussion and conclusion

Mixed-method approach



Conclusion and implication to pharmacy education

- This review identified several methods used in developing digital health education and training competencies for healthcare professionals.
- Future research is needed to adopt and adapt best practices for developing pharmacists' education and training strategies in digital health.

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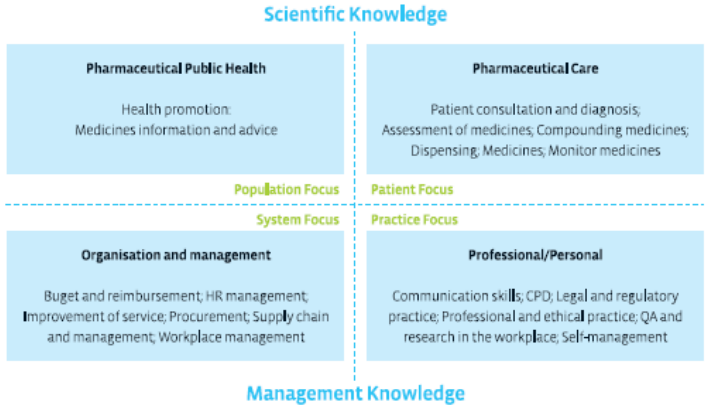
Future study

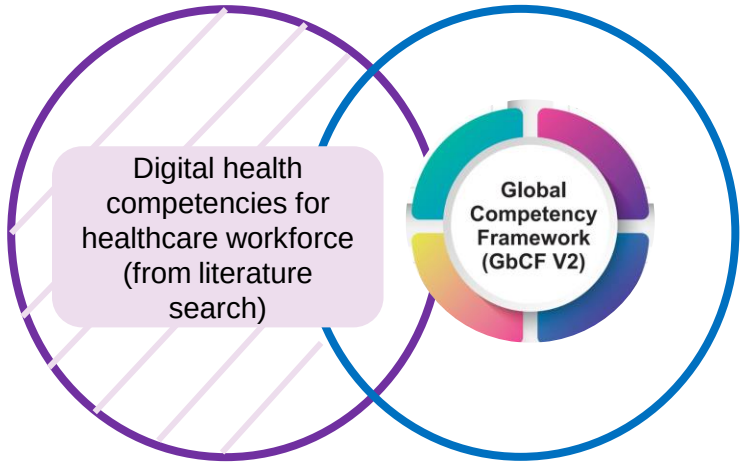
Development of Global Digital Health Competency Framework for Pharmacists

Global Competency Framework (GbCf)- 2012



\+ Digital Literacy

Global Competency Framework version 2 (GbCf v2)- 2020



Global Digital Health Competency Framework for Pharmacists

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Thank you for your attention

Lets connect and collaborate:

Afina Nur Fauziyyah
afina.fauziyyah.21@ucl.ac.uk

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