IMPACT OF TEST ANXIETY ON PHARMACY STUDENTS' PERFORMANCE IN OBJECTIVE STRUCTURED CLINICAL EXAMINATION (OSCE)

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WHAT WE KNEW

Assessments are integral component of any curricula. The evolution of "patient-centred" role of pharmacist necessitated significant changes in pharmacy curricula in order to equip pharmacists with required knowledge and skills to meet patient needs. Performance-led assessment methods such as the Observed Structured Clinical Examination (OSCE) are better placed to evaluate the fundamentally important clinical skills of pharmacy students. The reliability and validity of OSCE in assessing the clinical competencies of students has been well established.

Furthermore, increased levels of perceived stress and anxiety during academic assessment periods have been reported in the literature among healthcare students.

WHAT WE WANTED TO DO

- To design & implement OSCE method of assessment in clinical courses of our curriculum.
- To assess association between test-related anxiety and pharmacy students' performance in OSCE.

Scan this QR code to watch the video feedback from students.

WHAT WE DID

OSCE DEVELOPMENT
- Several training sessions/workshops were conducted with staff members about how to write OSCE stations.
- Sessions were conducted with students also about introduction and logistics of the OSCE process.
- The OSCE was conducted in 5th year PharmD as part of continuous assessment and included three courses: Therapeutics III (Neurology and Psychiatry), Therapeutics IV (Paediatrics, Men's and Women's Health) and First Aid. A brief description of OSCE stations has been given in the Table. Some OSCE stations had 'critical elements' which means that failing to address that point would result in zero mark on that station. Students were aware of the presence of critical elements in the OSCE but were not informed which stations in particular had this element. A formative OSCE was also held a week before and group as well as individual feedback was given to students before summative OSCE.
- A cross-sectional survey was administered to the students before the beginning of summative OSCE using validated Test-Anxiety Inventory (TAI) scale.
- All quantitative data was analysed using SPSS v20.

WHAT WE FOUND

All 25 students (10 males and 15 females), completed the survey. There was no statistically significant difference between males and females for TAI-Emotionality subscale (P=0.43), TAI-Worry subscale (P = 0.25) and TAI-Total score (P = 0.34). However, females had higher marks in OSCE compared with males (P=0.01) . After adjusting for gender, multiple linear regression analysis showed a statistically significant negative association between TAI-W score and marks obtained in OSCE (P=0.02; 95% CI = - 0.42, -0.03).

SO WHAT

Following the development and implementation of OSCE assessment method and lessons learnt from the anxiety cross-sectional survey, OSCE has been rolled out in other courses and years across our curriculum.
Test-anxiety can lead to underperformance by students especially in the practical examinations. Mock exams or formative assessments can help students not only to prepare for summative examinations but also cope with text-anxiety leading to better academic performance.

Scan this QR code to access the full paper with a table of brief description of the stations.

UTILIZING FIP NANJING OUTCOMES TO TRANSFORM PHARMACY EDUCATION AND PRACTICE IN FIP UNESCO UNITWIN CENTER FOR EXCELLENCE IN AFRICA PROGRAM

Ralph J. Altiere[1,2] and Nilhan Uzman[2], [1]University of Colorado USA and [2]International Pharmaceutical Federation (FIP)

Introduction. The goal of the FIP-UNESCO-UNITWIN Center for Excellence in Africa (CfEA) program established 10 years ago is to transform pharmacy education and workforce (academic, practice, research) to meet societal health needs in CfEA member countries (Ghana, Kenya, Namibia, Nigeria, Uganda, Zambia) aligned with the FIP-UNESCO-UNITWIN Program on Global Pharmacy Education Development. Three important events occurred recently that guided CfEA efforts:

- 2016 FIP Nanjing Conference on Pharmacy Education
- Governance changes in CfEA
- Partnership with the SPHEIR Kenya-Nottingham program to develop a national competency framework for pharmacy education in Kenya (see related poster by Claire Anderson)

FIP Global Competency Framework (GbCF) and FIP Nanjing Statements and Pharmaceutical Workforce Development Goals (PWDGs 1-10 & 13) were utilized to identify gaps in pharmacy education and workforce to develop evidence-based transformation programs.

Design. Representatives from all CfEA schools were tasked with utilizing these FIP resources to map their curricula, educational standards and workforce strategies to identify gaps and determine priorities for advancing their pharmacy education programs. Each country reported their findings at the CFEA meeting in Lagos, Nigeria in June 2018.

Results. Numerous gaps and needs were identified, many common to all schools, e.g., interprofessional education. Systematic and thorough discussions led to agreement on three priorities:

Results.
- Academic Capacity (quantity and expertise)
- Needs-based Education Strategies
- Advocacy (enabling environment for education and practice)

Working groups (WGs) were formed for each priority, each with a lead from one of the CfEA members; monthly conference calls provided for support and progress updates.

Results of the WGs will be reported at the June 2019 CfEA annual meeting in Mombasa, Kenya to be held in conjunction with the Pharmaceutical Society of Kenya (PSK) who, along with other stakeholders (WAPCP, CPA, APF, KPSA), will provide their insights into pharmacy education and workforce needs.

Outcomes. In addition to outcomes related to the three priority areas, i.e., progress and continued action plans to advance pharmacy education, two other expected outcomes of the Mombasa meeting:

- a policy paper on pharmacy education in Africa and
- a session on pharmacy education at a planned FIP Regional Conference in Africa in 2020.

Outcomes of the Mombasa meeting will be provided at the Monash Pharmacy Education Symposium.

Conclusion. The UNITWIN CfEA program is the first multi-country effort to effectively use the FIP Nanjing Statements, PWDGs and GbCF to develop a program for transforming pharmacy education and workforce to meet country and regional health needs. *www.fip.org; search publications – reports/reference papers*

Developing a National Competency Framework for Kenya

Claire Anderson, University of Nottingham & Nilhan Uzman, International Pharmaceutical Federation

The Kenya Nottingham SPHEIR project[1] aims to co-develop new pharmacy and chemistry curricular in 5 Kenyan universities. As part of the project University of Nottingham is working with FIP and five Kenyan universities to develop a national competency framework for pharmacy education to match the learning outcomes with population/health needs. This paper aims to describe the development process.

A pilot needs analysis was carried out at University of Nairobi and learning outcomes were mapped against competencies and behaviours using the FIP Global Competency Framework (GbCF)[2]. This was followed by a mapping exercise with a broad range of participants at a stakeholder meeting at Maseno University. They were asked to identify the key skills and competencies need and employability drivers for pharmacists in Kenya based on sectors. The next meeting was held in June with Kenyan, African and international stakeholders to gain a better understanding of how pharmacy services are distributed across Africa and discuss how to evaluate what the health needs are in Kenya and gather some ideas for an in-depth Health Needs Assessment.

The curriculum in Kenya was not yet matched with the following competencies:

Public health
Consultation and communication skills
Medicines management and optimization
Documentation
Evidence based decision making
Leadership, management, team playing, risk management
CPD behaviours
Interprofessional collaboration
Ethics and integrity
Basic emergency care

In developing the National Competency Framework for Kenya we will make sure that additional local needs will be met. Further multi-stakeholder meetings will be held with two other Kenyan universities to further refine what needs to be included in a national competency framework for Kenya.

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DEVELOPMENT OF SELF-CARE SCENARIOS REQUIRING ETHICAL DECISION MAKING USING AN ONLINE PHARMACY SIMULATION, MYDISPENSE

PharmAlliance

THE UNIVERSITY of NORTH CAROLINA at CHAPEL HILL

MONASH University

UCL

Heidi Anksorus[1*], Stefanie P. Ferreri[1], Louise Brown[2], Terry Ng[2], Vivienne Mak[3], Keith Sewell[3]
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Background: MyDispense, an award-winning online pharmacy platform developed by Monash University simulates non-prescription (OTC) and prescription dispensing in community pharmacy.

Simulations:
- have "the benefit of trial and error practice to become a more informed decision-maker in similar experiences in the future."[1]
- are important in pharmacist training, allowing opportunities to learn from mistakes without compromising patient outcomes.

Currently, there appear to be no simulated online teaching tools to support professional and ethical decision making in pharmacy for self-care and OTC drugs. However positive outcomes have been shown in medical students and within the educational setting.[1,2]

Objective: To prepare students for practice through the utilization of complex cases involving special patient populations and the enhancement of the MyDispense OTC function.

Design: The MyDispense program software functionalities were further developed to expand use and enhance traditional teaching methods, through the development of 9 complex self-care scenarios (Figure 1). Students were required to apply and justify their ethical and professional decision-making skills when making self-care recommendations and preliminary pilot results were collected.

Figure 1: Example Self Care Case: Pregnancy & Codeine Use

Be able to ask patients specific questions that you type instead of having to select from pre-set questions

Include a timer

I would like to see more clinically-oriented cases

Broad range of topics chosen and not all were straightforward - makes us think.

Figure 2: Student Feedback

Question	Strongly Agree	Agree	Neither Agree or Disagree	Disagree
MyDispense OTC for self-care cases were more realistic than similar paper cases presented in coursework.	13	12	2	-
I was able to apply concepts learned in previous courses or modules about non-prescription medications.	15	11	-	1
The exercises improved my decision making process when managing complex self-care queries.	11	14	2	-
The exercises improved my confidence in managing complex self-care queries.	10	15	2	-

Table 1: Responses to Survey Questions (N=27)

Results: Overall, students responded positively to the MyDispense OTC platform and exercises (Table 1) and 93% of students determined the level of the exercises overall were "just right."

Students in the pilot provided feedback on the use of MyDispense OTC as shown in Figure 2.

Conclusion: These results allow the development of a strategy on how to better use more complex exercises and introduce more structured clinical decision making in the MyDispense OTC platform in areas such as: strengthening current face-to-face OTC teaching; preparing students to provide a higher standard of patient care on placement; integrating into students' competency assessment for managing patients with self-care; development of the OTC platform for use by graduates preparing for registration examinations and competency sign off.

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LEARNING WITHIN AN ONLINE COMMUNITY OF PRACTICE

FOR LOCUM PHARMACISTS

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Aim

To determine the learning value of an online community of practice to locum community pharmacists in the UK.

Study design

Two months' posts from an online chatroom created for UK locum community pharmacists were analysed in 2016.

Ethical approval was obtained from the University of Central Lancashire, UK. Anonymised text was analysed using a novel method that integrated Bales' interaction process analysis and thematic analysis.

Results

Small, temporary social groups were created online, which met definitions for **communities of practice**. Posters were forming identity as pharmacists via their interactions in the following ways:

- **Value making** – sharing opinions and views on what it means to be a pharmacist
- **Creating a common culture** – 'thinking like a pharmacist'
- **Sharing information** – supporting a joint opinion-forming base that develops ideas on pharmacy practice
- **Community formation** – helping develop common language and values where ideas can be shared

Conclusion

The study showed the chatroom was composed of an engaged, respectful, vibrant and sometimes challenging group of individuals discussing pharmacy issues online. It demonstrates the value of online networking to development of professional identity, culture and knowledge.

To learn, pharmacy students need to do: A pilot on learning asthma first aid

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Introduction

Instructional activities that promote active learning encourage developing pharmacy students' knowledge and skills. To provide the technical skills that future pharmacists need, schools of pharmacy are moving from courses that predominantly offer knowledge to courses with a greater emphasis on acquirement of skills. **The primary objective of this study was to assess the impact of two learning modalities (online training and simulation) on pharmacy students' ability to perform asthma first (AFA). The secondary objective was to explore students' preferred learning method for technical skills with the example used as AFA after exposure to two different learning modalities.**

Design

Pharmacy students from Amman, Jordan were invited to participate in AFA training workshop. Students were assigned to one of two groups of 25 students to complete a 1-hour online training course in AFA or participate in scenario-based simulation as their **first** learning exposure. Student ability to perform AFA was assessed in role-playing scenarios using a checklist instrument. Students' preferences on methods of learning, opinions and thoughts of the workshop were investigated by focus group discussion and semi-structured questionnaire.

Results

Eighteen students (n=50, 36%) were assessed on their skills to manage acute asthma exacerbation by simulation and provided with immediate formative feedback. Overall, 33.3% of all assessed students were deemed competent in AFA. A chi-square test for independence indicated no significant association between students' performance in AFA and educational intervention, $X2 (1, n = 18) = 0.000$, $P = 1.00$, phi = 0.00. Focus group discussions yielded three main ideas students considered important in their learning: blended learning methods, active learning opportunities; and novelty in learning.

Conclusion

Learning technical skills in pharmacy is facilitated when teaching design provides active learning opportunities that involve students 'doing' (practicing) particular skills, observing others perform these skills and receiving appropriate formative feedback to enhance performance.

Figure 1: Inhalers and spacer devices provided to students in the study

THE DESIGN OF PRECEPTORS DEVELOPMENT PROGRAM FOR HEALTH CLUSTER IN QATAR "THE PRACTICE EDUCATORS ACADEMY"

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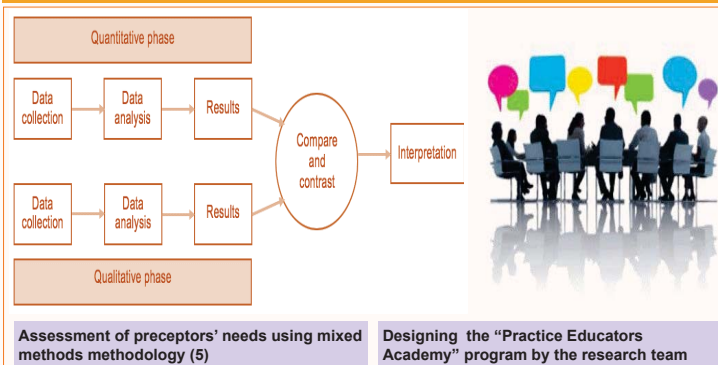
Background

- At Qatar University, the College of Pharmacy (CPH), the College of Medicine (CMED) and the College of Health Sciences (CHS) have been recently joined to be part of the Health Cluster, which aimed at sharing resources and unifying the skills of adjunct faculty members (clinical preceptors) involved in practice-based teaching.
- Experiential education is a fundamental component of health profession education programs that aim to develop students' knowledge and skills necessary to practice competently in the healthcare setting (1).
- The quality of the learning during experiential education activities is highly influenced by how the training experience is planned, supervised and assessed by clinical preceptors (2).
- Although preceptors have received substantial clinical training, research has shown that most preceptors have suboptimal educational training in teaching methods, assessment, and provision of feedback to students (3).
- To address that, preceptors should be oriented to their respective educational curricula, teaching methods, students' assessment, and to considering students' needs and expectations (4).

Aim

01 Assess the educational needs of QU Health Cluster preceptors

02 Design the "Practice Educators Academy" program

03 Validate the "Practice Educators Academy" program

04 Refine the "Practice Educators Academy" program

Methods

Quantitative phase: Data collection → Data analysis → Results
Qualitative phase: Data collection → Data analysis → Results
→ Compare and contrast → Interpretation

Assessment of preceptors' needs using mixed methods methodology (5)

Designing the "Practice Educators Academy" program by the research team

Results

Stage 1: Assessment of the preceptors' educational needs

Qualitative

Planning: *"I think the most important improvement needed is preparation for the rotation."* CMED, Student

Delivery and Instruction: *"Definitely the preceptors need teaching skills development."* CHS, Faculty

Assessment: *"Some of the preceptors are just not familiar with the assessment tool itself"* CPH, PharmD Student

Feedback: *"I know that we miss the positive feedback we focus only on the negative points only"* CPH, Preceptor
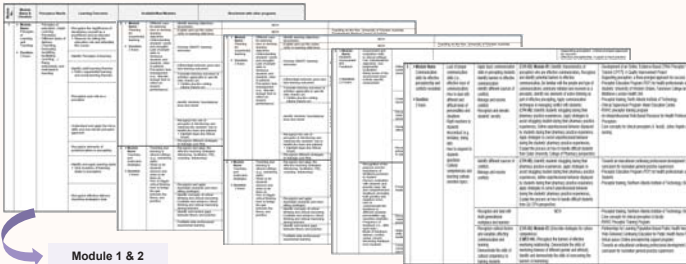
Communication: *"During OSCE, there was one doctor I do not know if I would say rude, aggressive."* CMED, Student

Quantitative

Table 1: Preceptors' educational needs (n= 209)

Preceptors' needs	Not a priority	Low priority	Medium priority	High priority
Adult Learning Principles*	6 (2.9%)	19 (9.2%)	58 (28%)	123 (59%)
Curriculum & Course Design	3 (1.45%)	15 (7.2%)	52 (25%)	137 (66%)
Writing Educational Objectives*	2 (0.98%)	19 (9.2%)	59 (29%)	125 (61%)
Lecturing and Large Group Teaching	2 (0.97%)	31 (15%)	59 (29%)	114 (55%)
Tutorial and Small Group Teaching	1 (0.48%)	23 (11%)	63 (30%)	120 (58%)
Facilitating PBL	0 (0.0%)	16 (7.7%)	52 (25. %)	138 (67%)
Teaching and learning in clinical settings	4 (1.9%)	11 (5.3%)	41 (19 %)	152(73 %)
Providing Feedback	0 (0.0%)	20 (10%)	51 (25%)	135 (65%)
Assessment in clinical settings	6 (2.9%)	14 (6.7%)	45 (22%)	139 (68%)
Clinical Simulation	6 (3%)	13 (6.4%)	50 (25%)	133 (65%)
Curriculum & course evaluation	0 (0.0%)	16 (7.9%)	56 (28%)	131 (64%)
Mentoring skills	0 (0.0%)	15 (7.3%)	42 (20%)	149 (72%)
Educational research skills	0 (0.0%)	15 (7.2%)	50 (24%)	144 (69%)

Results

Stage 2: Design of the "Practice Educators Academy" program

Module 1: Principles of Learning and Teaching
Module 2: Planning for Experiential Learning
Module 3: Teaching and Instruction Strategies
Module 4: Students' Assessment & Feedback
Module 5: Communication Skills for Effective Preceptorship and Conflicts Resolution

Module 1 & 2

Module No.	Module Name & Duration	Preceptors Needs	Learning Outcomes	Existing/ New Modules	Benchmark with other programs
1	Module Name: Principles of Learning and Teaching. Duration: 2 hours	- Principles of education: (Adult Learning Principles) - Different styles of delivery: (Teaching, instructing, modelling, facilitating, coaching…) - Being enthusiastic and motivated in teaching	-Recognize the significance of developing yourself as a practitioner and an educator	NEW	-The Australian Clinical Education Program
			-Identify Principles of learning	NEW	-The Australian Clinical Education Program
			-Identify adult learning theories	EXISTING	-An Interprofessional Web-Based Resource for Health Professions Preceptors
			-Recognize your role as a preceptor	EXISTING	-Preceptor training; North Alberta Institute of Technology
			-Understand and apply the micro-skills and one-minute preceptor approach	NEW	-Preceptor Development Program, University of Virginia
			-Recognize elements of professionalism in precepting	EXISTING	-Towards an educational continuing professional development (EdCPD) curriculum for Australian general practice supervisors
			-Identify and apply learning styles	NEW	-Improving Preceptor Self-Efficacy Using an Online Educational Program
			-Recognize effective delivery (teaching strategies) style	NEW	-Developing and Implementing an Academy of Preceptors
2	Module Name: Planning for experiential learning. Duration: 2 hours	-Different ways for planning -How to develop learning objectives -Understanding students' needs and strengths -Lack of proper skills to introduce students and students' roles to patients -Preceptors time management (e.g., allocate enough time to reflect on student performance)	-Identify learning objectives taxonomies	NEW	
			-Explain and use the action verbs in learning objectives	NEW	-Teaching on the Run
			-Develop SMART learning outcomes	EXISTING	-Preceptor Education Program (PEP)
			-Differentiate between good and bad learning outcomes	EXISTING	
			-Translate learning outcomes to activities applicable to specific sites (hands-on) -Outline practice setting criteria (hands-on)	NEW	-Towards an educational continuing professional development (EdCPD) curriculum for Australian general practice supervisors
			-Identify students' foundational level and needs	EXISTING	-Mission possible CD ROM: Instructional tool for preceptors
			-Recognize the role of preceptor in introducing and clarifying the students' role to healthcare team and patients	NEW	-RWHC preceptor training program
			-Recognize different strategies to manage your time	EXISTING	-Preceptor training; North Alberta Institute of Technology

Stage 3 & 4: Validation and refinement of the "Practice Educators Academy" program

Monash University · University of Toronto · Lebanese American University · University of British Columbia · National Taipei University of Nursing and Health Sciences · University of Tasmania

There is lesser exposure to reflective practice in this program

Add a hands-on simulation to allow attendees time to practice

Inter-professional learning should be taught in module one

Conclusions

- "The Practice Educators Academy" is the first intervention nationally and regionally to develop the educational skills of preceptors considering their needs, while benchmarking with other programs available internationally.
- The development of academy aligns with the third pillar of the Qatar National Vision 2030 (6) on human capital development, and with the International Pharmaceutical Federation (FIP) Workforce Development Goals (7).
- This alignment is key in workforce planning and capacity building, nationally and globally, in order to achieve universal health coverage by 2030.
- Future research should focus on evaluating the effectiveness of the "Practice Educators Academy" program in improving the preceptors' educational knowledge and skills, and enhancing students' satisfaction.

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WHAT SKILLS DO PHARMACOEPIDEMIOLOGISTS NEED: DEVELOPMENT OF THE CORE CURRICULUM FOR HEALTH PROFESSIONAL STUDENTS

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Objective: Post-marketing surveillance of medicine safety requires clinical and epidemiological expertise. Rapid advances in the availability of administrative health data, electronic medical record systems and new analytical techniques are transforming the discipline of pharmacoepidemiology. Clinicians and researchers require new skills to access, analyse and appraise health data. ***The objective is to develop a core curriculum in pharmacoepidemiology for health professional students undertaking higher degree research.***

Design: Core curriculum development is being undertaken by the Australasian Society of Clinical and Experimental Pharmacologists and Toxicologists Pharmacoepidemiology Special Interest Group. Overall, 19 researchers and doctoral candidates from four Australian states participated in stakeholder discussions and a curriculum mapping exercise in Adelaide in November 2018.

Results: Mapping was performed based on current training models at six Australian and one international institution. The content and duration of training models were diverse. Training was predominantly provided through external short courses, pre-conference workshops and online modules. Core skills identified were 1) fundamental principles of epidemiology, 2) medication use as an exposure in epidemiological research, 3) strengths and limitations of different health data, 4) ethics, data security, and responsible reporting, and 5) applied biostatistics. As the first step, an online repository of training materials was proposed to facilitate sharing and assist curriculum development. Furthermore, development of a basic training package suitable for delivery across multiple institutions or on a rotational basis was proposed.

Conclusion: Specific training for pharmacoepidemiology in Australia is scarce. Sharing of existing resources and development of a new training package will equip health professional students to remain at the forefront of medicine safety research.
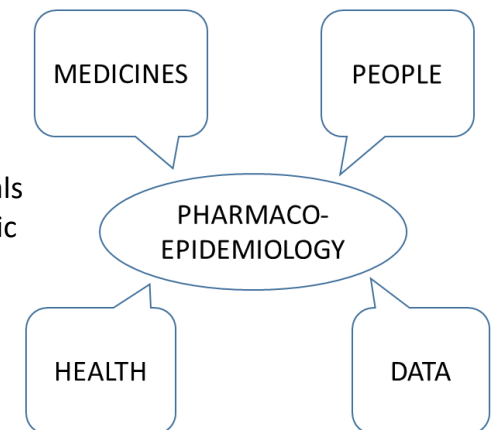
MIE Resources, 2019

ATTEMPTS FOR MODERNIZATION OF TEACHING PHARMACOGNOSY SUBJECT IN UNIVERSITY OF PÉCS

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Keywords: pharmacognosy, phytochemistry, practice, educational methods

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Objective: To adapt some parts of pharmacognosy and phytochemistry curriculum to modern challenges of pharmacy education.

Design or Method: In the past 10 years, the classical pharmacognosy curriculum (macroscopic, microscopic, and phytochemistry examination of herbal drugs) have been supplemented with some new tasks (e.g. role-play activities) in University of Pécs, which are intended to help the pharmacy students to adapt to the new challenges of our world.

Results: There are a lot of outstanding teaching supplements in the field of pharmacognosy (Hänsel und Sticher, 2010; Heinrich et al., 2018; etc.), but some new topics are underrepresented in this context, and we could not find public practical notebooks. Additionally, the behaviour and needs of the students are changing rapidly, the classical teaching methods are not efficient for most of them, we are constantly trying to reorganize the most important knowledge in this field and develop new teaching strategies (e.g. more interactive, e-learning methods) adapted for the field of pharmacognosy. It also should be noted, that there are intercultural differences between the students (especially, if they study in foreign countries) and difference between the health care and educational systems.

Conclusion: Pharmacognosy is a robust and basic subject within the pharmacist curriculum. However, we have to save the bases, it also requires some adaptations to the changing demands of the students and communities. The authors are open for help and advice of pharmacognosy teachers worldwide in these questions.
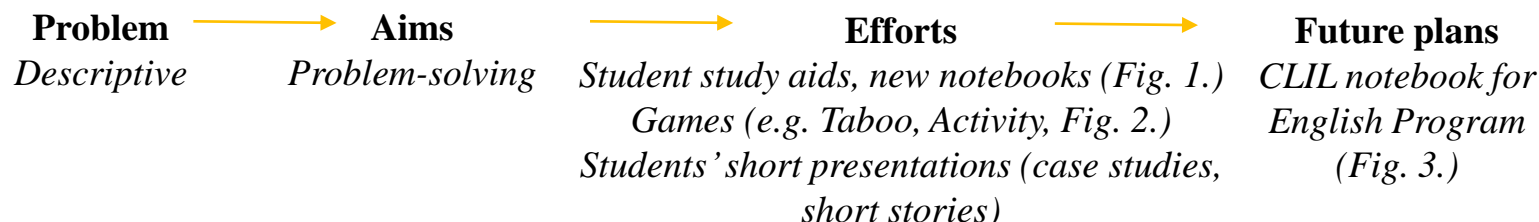
Problem → **Aims** → **Efforts** → **Future plans**

Descriptive — *Problem-solving* — *Student study aids, new notebooks (Fig. 1.) Games (e.g. Taboo, Activity, Fig. 2.) Students' short presentations (case studies, short stories)* — *CLIL notebook for English Program (Fig. 3.)*

Figure 1. Pharmacobotanical and phytochemical investigations of herbal drugs – Teaching Supplement (Details)

MATRICARIAE FLOS
Indicate the following structures in the microphoto:
- petal, ovary, anther, polen grain, stigma

Matricariae flos cs.

The ovary is in ………………….. position (relative to the stamens and petals) in the flowers of chamomile (and in general in the Asteraceae family).

At higher (400x) magnification, which type of pollen grains can be observed according to their ornamentation?

Half one flower and draw the hollow receptacle into the box.

Figure 2. Taboo card (Details)

STARCH
A: technology
B: powder
C: white
D: tablet

Name the parts of the HPLC system.
1. ....
2. ....
3. ....
4. ....
5. ....
6. ....
7. ....

Match the terms with the pictures.
1. peak fronting
2. overlapped peaks
3. peak tailing
4. baseline separation

A) B) C) D)

Figure 3. Terminology of pharmacobotany, pharmacognosy, and phytochemistry notebook (Details, in progress)

INTERACTIVE AND MODEL DRIVEN TEACHING PUSHES STUDENTS TO LEARN

Jörgen Bengtsson, Division of Pharmacokinetic and Drug Therapy, Faculty of Pharmacy, Uppsala University, Sweden

Objective: To develop an individual, interactive, model-based task in order to increase the student's responsibility and motivation and thereby obtain a better understanding for pharmacokinetics and pharmacodynamics.

Design:

- Students log in to a website (QR-code below) and a unique substance is created, whose PK and PD parameters should be calculated
- Sparse instructions - curiosity is the driving key forward
- Limitations are integrated into the model (i.g. number of blood samples, LOQ)
- The task is divided into five steps and to get access to the next step, students need satisfactory calculations and a personal reflection on what they have learned
- Instant feedback on calculations
- Summarize in a SPC, discussed and reviewed during a final seminar

Results:

- Tutoring is held on a conceptual level
- No old solutions available
- Students need to reflect over study design and integrate other subjects
- Individual numbers but students are encouraged to work together

Conclusions:

By distributing the responsibility for the learning to the students, and creating an environment where curiosity promotes learning, we've observed that students are better prepared and discuss at a higher level. The task also supports oral and written progression.

ASSESSMENT OF PHARMACY STUDENTS' KNOWLEDGE AND ATTITUDES TOWARDS GERIATRIC PHARMACY EDUCATION AND OLDER ADULTS: FINDINGS FROM MULTIPLE UNIVERSITIES IN MALAYSIA

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Objective: The proportion of the Malaysian geriatrics has increased from 1 million to 2.2 million between 1991 to 2010. This increment will make up a greater proportion of the clinical work of almost every healthcare providers. Consequently, the need of geriatric care education will increase. This study attempted to assess the pharmacy students' knowledge and attitude towards geriatric education and older people to gauge their preparedness to provide a quality care to this population.

Design or Method: A self-administered questionnaires were distributed among final-year pharmacy students in 5 different public and private Universities in the Klang Valley area, Malaysia. The survey included 3 sections: sociodemographic section, assessment of knowledge section using a validated 28-item Geriatric Knowledge Assessment Scale (to measure students' geriatric knowledge in the areas of aging disease, physical activity, drug therapy, and nutrition) and assessment of attitudes towards geriatrics education.

Results: A total of 311 students participated in the study (response rate is 70.01%). The mean total score of Geriatric Knowledge Assessment Scale was 15.6 ± 3.7 (minimum: 2 to maximum: 27). Majority of students (80%) in our study agreed that taking course focused on geriatric care is essential and they are interested to gain further knowledge and training in geriatric care.

Conclusion: The findings showed that the students have an average knowledge in the different areas of the geriatric care. This further reaffirms the need for incorporating the geriatrics education and training into pharmacy curriculum to improve their quality of service in the future.

Development of an effective measure assessing MPharm students' perception of the usefulness of their experiential placements at Green Light pharmacy

Lawrencia Louise Brown[1], Ian Bates[1], Simon Harris[2], Jane Portlock[3]

University College London UK [1], GreenLight Pharmacy, UK [2], University of Sussex Pharmacy UK [3]

- **Background:** It is important to give pharmacy students opportunities to apply their knowledge prior to graduation and entering the workforce.
  - UCL collaborated with GreenLight to create an educational centre in one of their branches
  - All students attend sessions
  - Materials align with core modules, are co-created and co-taught by UCL and GreenLight.
  - Ensuring that experiential learning is an effective and useful experience is essential for MPharm courses
- **Objective:** To develop a measure of utility for community-based experiential learning in undergraduate students.

Design: A feedback survey was designed and delivered to all four year groups on the MPharm over the last 5 years. Factor analysis was used to identify measurement constructs with subsequent descriptive and comparative statistics.

Examples of Questions

I felt my Green Light placements were generally well organised

I understood what prework had to be completed for each of my placements

I enjoyed learning in a community pharmacy environment

I think my GL placements were linked and supported by my other UCL teaching

I think the GL placements have improved my ability to counsel patients on their dispensed medication

I enjoyed rotating through different activities during my placement
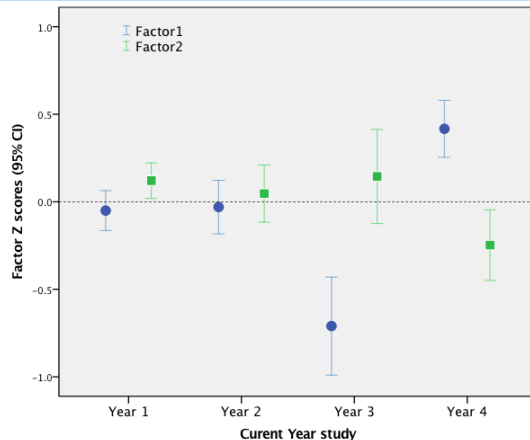
Conclusion: Initial results indicate: Years 1 and 2 are satisfied with both the overall design and what they experience and learn on the placements. Year 3, students' satisfaction with the design continues but suggest the areas of practice covered do not add to their learning.
In year 4 students, the pattern appears reversed with a high degree of satisfaction with the learning outcomes covered.

Future work: Initial observations suggest year 3 students may benefit from experiencing the year 4 team based simulation exercises which practice knowledge and skills together gained across the whole MPharm.

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Gender distribution
in the global pharmacy workforce

Ian Bates[1,2], Hafeez Hussain [2], Sherly Meilianti[1,2], Lina Bader [1], Louise Brown [1]

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The **objective** of this paper was to extract and identify current trends in global female pharmacist participation in workforce and potential impact on equity and education challenges.

Pharmacy workforce data collected by FIP was accessed to identify country-level gender participation data at 2 or more time points from 2009 to 2016; 41 Countries contributed data.

Analysis of association between female pharmacist participation in a country over time and country-level variables such as income level was identified using a linear mixed model approach.

Between 2009-16, female pharmacists in the global workforce increased from 58% to 62%.
Significant links with female participation and country level income ($p = 0.026$) and WHO region ($p = 0.03$)
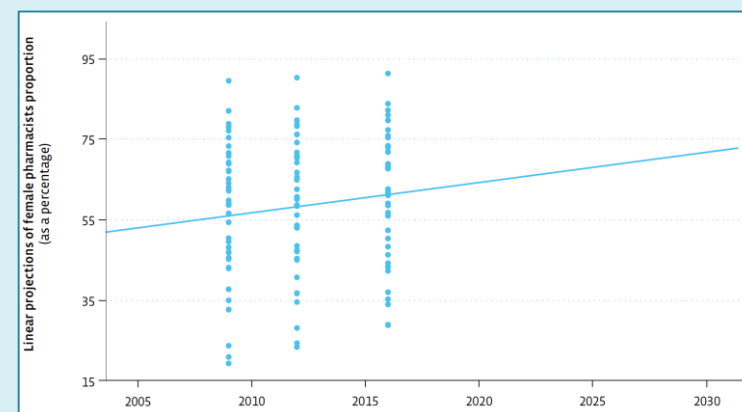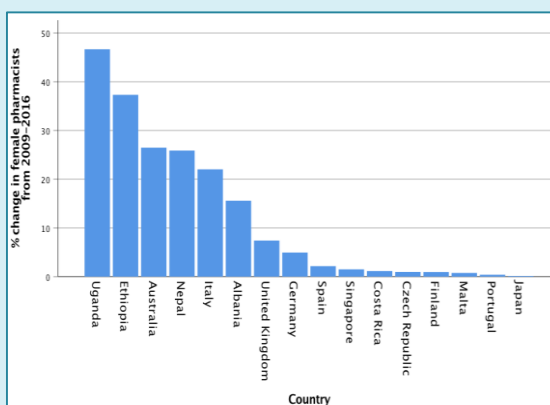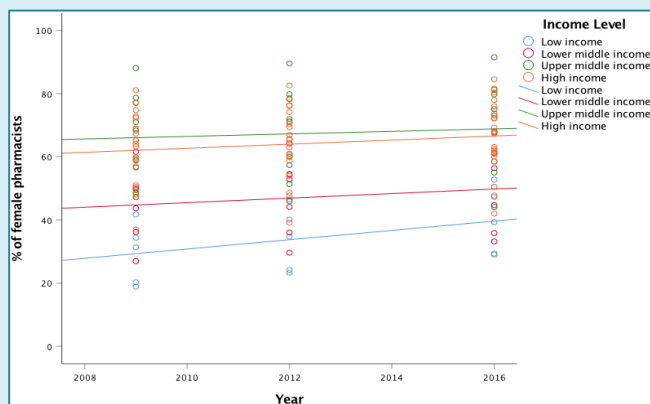
LMICs show the largest rate of change in female participation over the time.
Projections indicate 74% of the global workforce will be female by 2030.

1. There is an acceleration in the proportion of female pharmacy workforce globally.
2. Higher-income countries currently have a significantly larger percentage of female pharmacists.
3. The impact of a growing female proportion in the pharmacy workforce now needs to be investigated; related to CPD and education, support for career breaks and equity in career progression

LEARNING AND ADAPTING FROM STUDENT ASSESSMENT DATA

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University of Colorado Skaggs School of Pharmacy and Pharmaceutical Sciences, Aurora, Colorado, United States

Study Objective

Demonstrate how student assessment data can be used to facilitate changes to program learning outcomes, curriculum, and assessments.

Method

Three years of data from a new assessment was collected and analyzed to evaluate the validity of the tool in assessing student practice readiness during end-of-curriculum pharmacy practice rotations and to make summative evaluations of curriculum effectiveness.
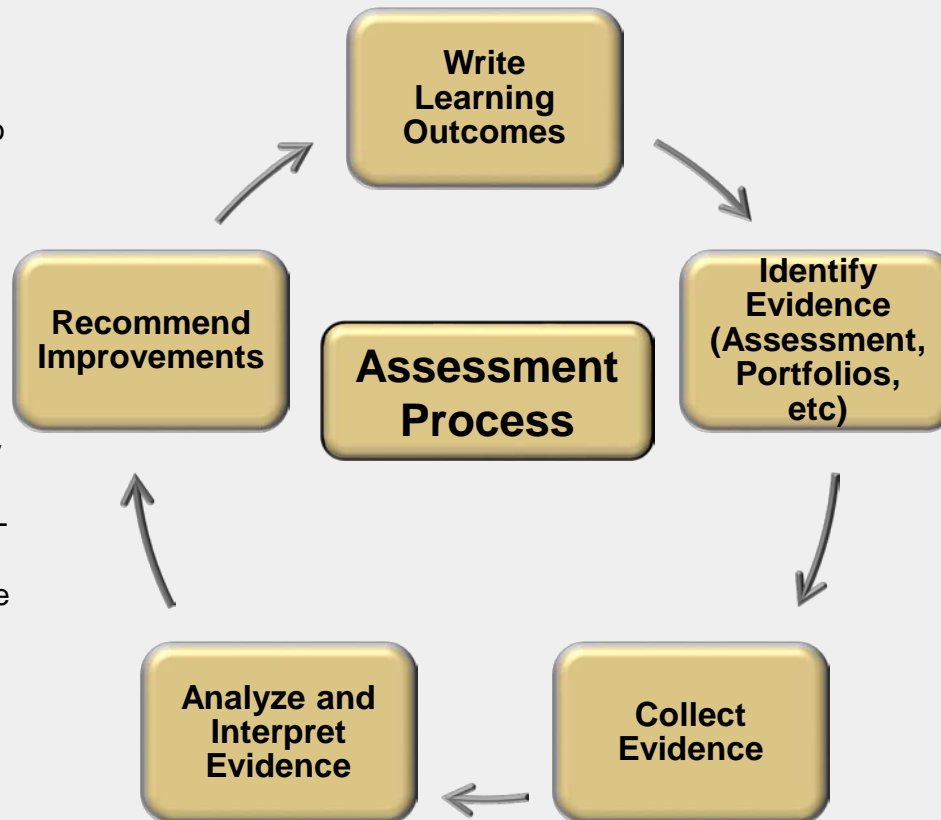
Results

Students demonstrated competency in the domains of professionalism, communication, and practice skills supporting the use of the new tool in assessing practice readiness. Aggregate data indicated opportunities to to further strengthen student development.

Conclusion

Students are prepared for practice. Minor changes were made to learning outcomes to better align with practice expectations. Early learning and assessment opportunities were introduced to support student development throughout the program.

Assessment Process

- Write Learning Outcomes
- Identify Evidence (Assessment, Portfolios, etc)
- Collect Evidence
- Analyze and Interpret Evidence
- Recommend Improvements

Skaggs School of Pharmacy and Pharmaceutical Sciences

An Exploration of Pharmacy Education Researchers' Perceptions of and Experiences Conducting Qualitative Research: Challenges and Benefits.

Antonio A. Bush, PhD, Mauriell Amechi PhD, Adam Persky, PhD

UNC Eshelman School of Pharmacy
University of North Carolina at Chapel Hill

BACKGROUND AND PURPOSE

The purpose of this study was to investigate pharmacy education researchers' (i.e., faculty, postdoctoral fellows, pharmacy/graduate students, and residents) experiences conducting qualitative research (including challenges and barriers) and their perceptions of qualitative research in pharmacy education (QRPE).

RESEARCH QUESTIONS

1) What concerns impede pharmacy educators from employing QRPE?
2) What are the barriers and challenges of employing QRPE?
3) What are pharmacy educators' perceptions of the benefits of employing QR?

METHODS

- One-time, in-depth interviews were conducted with 19 participants using a semi-structured protocol.
- **Participation Criteria**: (**a**) identified as a pharmacy faculty, postdoctoral fellow/scholar, resident, graduate student; and/or staff member; (**b**) affiliated with an accredited school/ college of pharmacy; and (**c**) experience conducting pharmacy educational research (e.g. quantitative, qualitative, and/or mixed methods).

DEMOGRAPHICS

Gender	Employment/Trainee Classification
Female	Faculty or Staff
n=15 (78.9%)	n=15 (78.9%)
Educational Attainment Level	**Conducted Qualitative Research**
Doctoral or Professional degree	Yes
n=19 (100%)	n=16 (84.2%)

CONCLUSIONS

Despite the increasing application of rigorous qualitative approaches in many health science fields today, it mostly remains underutilized in pharmacy. In an attempt to catalog pharmacy education researchers' perceptions of and experiences conducting qualitative research, we provide empirical evidence to an anecdotal dialogue that has long existed in pharmacy education regarding qualitative research. The findings from this study are especially useful in pharmacy and pharmaceutical sciences as the need to address complex problems intensify in a rapidly evolving environment. Whether as a standalone method or combined with quantitative approaches, qualitative approaches may provide a suitable solution to advance pharmacy educational research.

RESULTS

Pharmacy Educators' Qualitative Training Experiences
- Received formal qualitative research training via courses taken to fulfill degree requirements
- Received "on the job training": Informal qualitative research training

"Informal training has been basically I guess you'd call it immersion. I've gotten involved with projects that involved qualitative approaches and so I learned by going through that process what I know about qualitative research... I've been through two projects like that. In each case I learned from others who were more experienced how qualitative work was done." (Armando, faculty member)

Barriers and Challenges to Considering and Conducting Qualitative Research in Pharmacy Education
- "Barrier to entry": Lack of training and exposure.
- Recruitment of participants and collecting data
- Resources needed to analyze qualitative data (e.g. time, people, funds)
- Perceptions of the lack of acceptability, value, and appreciation of qualitative research in pharmacy education

"As pharmacists, we're taught to be so discrete and about numbers and things that are measurable, that sometimes qualitative research gets put in the backseat compared to everything else...Because I think some people do understand it, but they don't appreciate it. Some people don't understand it, and don't appreciate it. I think some people know what you're doing and they understand what you're doing; they just don't think it's robust. Where some people don't even know what it is, I mean wouldn't even know what it is to even have the capacity to appreciate it." (Willie, faculty member)

Perceived Benefits of Employing Qualitative Research in Pharmacy Education
- Exploratory nature of qualitative research and the need to answer complex research problems
- The richness of qualitative data
- Answering questions quantitative research may not be best positioned to answer
- Providing a holistic view of a problem or solution via mixed methods.

I think a lot of the questions that we need to ask can't be answered quantitatively. I still kind of come to this with bias that quantitative research answers some questions better than qualitative research can, but there's definitely a place for qualitative research. (Gwendolyn, faculty member)

Exploring How Pharm.D. Students Identifying as Underrepresented Racial Minorities Experience Cultural Competence Instruction at a Predominantly/Historically White Institution

Antonio A. Bush, PhD
UNC Eshelman School of Pharmacy
University of North Carolina at Chapel Hill

BACKGROUND AND PURPOSE

Schools/Colleges of pharmacy (S/CoP) have often acknowledged the rapid diversification of the US population and the rise of health disparities. Furthermore, accreditation bodies are mandating the inclusion of cultural competence (CC) content in curricula. This study explored how Pharm.D. students identifying as underrepresented racial minorities (URM) perceived CC instruction at a S/CoP.

THEORETICAL FRAMEWORK

❑ **Agency**: "assuming strategic perspectives and/or taking strategic actions toward goals that matter to him/her..." (O'Meara et al., 2011)

❑ **Socialization**: the process by which one "gains the knowledge, skills, and values necessary for successful entry into a professional career requiring an advanced level of specialized knowledge and skills." (Weidman et al., 2001)

❑ **Anti-deficit framework:** reverses questions that have generally been used to examine the deficiencies of higher education experiences of URMs and the outcomes thereof and presents them in a more positive approach. (Harper, 2010)

METHODS

❑ Twenty students from a S/CoP within a research-intensive institution participated in 60-90 minute interviews.

❑ Following audio transcription, the data were analyzed using the Sort and Sift, Think and Shift© method. Multiple coders used several rounds of open coding to develop a codebook, which guided the final rounds of coding and theme identification.

❑ Trustworthiness procedures included a dependability audit, peer debriefing, and analytic memos to promote reflexivity.

DEMOGRAPHICS

80% identified as Black, not Hispanic or Latino; 20% Other (including: Hispanic or Latino, of any race; Native Hawaiian or Other Pacific Islander, not Hispanic or Latino)

CONCLUSIONS

Students felt the curriculum lacked a CC emphasis (e.g., lack of cultural diversity in patient cases), and that CC was optional. In addition, students sensed that the responsibility to gain CC awareness had been placed upon them. Students often supplemented didactic CC instruction with co-curricular activities and intentionally sought immersion experiences in culturally diverse communities. Previous research shows that curriculum committee chairs and student leaders believe that CC should be required, however incremental changes have been implemented in curricula. This work provides insight into how URM pharmacy students perceived CC instruction, provides strategies to bolster CC engagement, and demonstrates how co-curricular experiences may be employed to advance CC delivery.

RESULTS

EXPERIENCES

Theme 1: Lack of CC instruction within the curriculum

Lack of diversity in Patient Cases
"I feel like most of the time our cases are based on White patients or Black patients and more so White patients than Black patients…I think it would be good for us to have a wider spectrum of patient populations because that does play into the health and what we are going to see on rotations and working in the community at this point."

Faculty Diversity and Impact on CC Instruction
"…the lack of diversity in faculty can unintentionally trickle down into how we're taught and things to be aware of and recognize."

Theme 2: Perceived impact of lack of CC instruction

"you don't see the complexity of what we will face as health care practitioners within our curriculum sometimes."

"I feel like as healthcare professionals or future healthcare professionals who will be working with all types of people, we should be exposed to cultural sensitivity classes or just ways that you should approach people."

Theme 3: Non-URM Peers and Faculty uncomfortable discussing CC topic

"You can tell when someone's getting ready to read a case. Before they get to [the term] 'African American,' they think about whether they should say 'African American' or 'black,' or they kind of stumble with saying it. And it's just like, this is weird…I don't really know how to fix that or react to those type of things. 'Cause I think it can be a two-way street. I noticed that you're uncomfortable. That makes me uncomfortable. But the person's trying to make sure that –they're not saying something wrong that offends somebody else, too. So it's kind of like walking on eggshells…So then it's like…I don't know. It just makes you feel more black. I don't know how to explain it."

AGENTIC PERSPECTIVES: MOTIVATORS

Theme 4: I'm here for a reason

"'Okay. I'm here for a reason. [The underserved patients] seeing more people that look like me makes them feel comfortable.' Just working in a setting where there's fewer people that look like them is kind of like, ensuring for them. Well, I'm here for a reason." I feel like it's impacted me to just continue to want to do something in pharmacy…be the change I want to see."

ACTIONS TAKEN TO NAVIGATE TOWARDS DEGREE COMPLETION

Theme 5: Supplementing didactic curriculum

Strategically seeking immersion experiences that primarily serve underserved populations
" [At my current rotation], the majority of my patients are African American, honestly. I'm actually working within an Immigrant Clinic right now. Everyone you're working with is an immigrant."

Co-Curricular Experiences
"So I get to see those clinical pearls with URM patients on my own…SNPhA. That's how I get my dose of cultural competence at the pharmacy school."

Same Destination. Different Journey:
Towards a Conceptual Framework Exploring Underrepresented Racial Minority Students' Experiences to Become Pharmacists.

Antonio A. Bush, PhD

UNC Eshelman School of Pharmacy
University of North Carolina at Chapel Hill

"So Dr. [Jones] was **the first black professor I have ever had in my life** like from the time I started school until pharmacy school. And she continues to be the only one I've ever had. That in itself to me is very significant because I'm going into a field and it's like I've never been shown that somebody that looks like me can do this based off of who have been my professors and who have been the people teaching me." [*Joanna, Black Female*]

"So there's this pressure to be successful as a student. **And then** there's this pressure to be successful as a black student and to be one of very few. That pressure, there's a lot of burden there." [Maurice, Black Male]

"I just want to feel a sense of belonging and I don't think I feel that right now. I'm happy and very proud to be here, but it's a different thing when you're coming here every day and you're sitting in the classrooms and you're just going through the motions. **I don't always feel like I belong**." [Patrice, Black Female]

A comparison of graduate-entry and undergraduate-entry pharmacy student performances in final year oral vs. written examinations

Suzanne Caliph, Angelina Lim, Tina Brock and Carl Kirkpatrick

Faculty of Pharmacy and Pharmaceutical Sciences, Monash University, Australia

BACKGROUND: Monash Pharmacy offers recent graduates with a relevant science degree accelerated entry into 3rd year after successfully completing an intensive summer bridging unit (Introduction to Pharmacy).

OBJECTIVE: To compare oral vs. written examination performances of graduate-entry (GE) vs. undergraduate-entry (UE) pharmacy students in their final (4th) year capstone unit (Integrated Therapeutics - Preparation for Practice)

METHOD: We performed retrospective analysis of OSCE and written examination results of final year students over 3 years (2015-2017).

RESULTS: Both GE (n=135) and UE (n=500) groups performed better in the written exams involving clinical problem-solving case studies compared with OSCE stations involving role-play scenarios for problem solving and oral communication.

- In written exam, UE students performed better than GE students (mean exam score 81% vs. 78%) with significantly higher proportion of UE students (61% UE vs. 44% GE) receiving high distinctions (HD = marks ≥80%).
- In comparison, GE students performed better in oral exam (OSCE) with higher scores (mean OSCE score = 70% vs. 68.5% for GE vs. UE). However, <20% of students from both groups achieved high distinctions in their OSCE (18% GE vs. 16% UE).
- A weak positive correlation was seen between written and oral examination marks for both groups: Pearson's r = 0.3 and 0.2 for GE vs. UE groups.

CONCLUSIONS: Mature GE students and younger UE students achieved similarly in written and oral exams, but with different strengths, likely related to their learning and life experiences.

- Significant differences in written vs. oral exam results could be attributed to differences in the levels of Miller's pyramid of competence assessed in these examinations.
- Written examinations traditionally assess "Knows" and "Know-hows" whereas clinical oral examinations (such as OSCEs) are designed to cover both cognitive and behaviour domains assessing knowledge, skills and attitudes. In our study, OSCE (oral examination) presented to be a more robust and challenging assessment for both graduate-entry and undergraduate-entry pharmacy students at final year level.
- Assessment design and support activities catering for mixed learner groups (such as GE and UE groups) need to be more complex but also present interesting opportunities for peer learning.
- Findings from this study contributed toward the design and development of the graduate-entry pathway for our new Vertically Integrated Master of Pharmacy curriculum.

Bar chart categories: Written Exam mean mark, OSCE mean mark, Written Exam HD%, OSCE HD%. Legend: ■ Graduate-entry group ■ Undergraduate-entry group

MONASH University

1 ACADEMIC CAPACITY   2 FOUNDATION TRAINING   3 QUALITY ASSURANCE
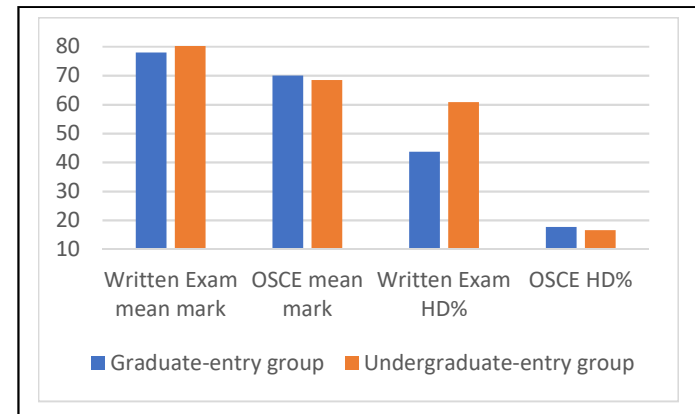
OBSERVATION OF ACTIVITIES UNDERTAKEN BY UNDERGRADUATE PHARMACY STUDENTS ON WARD-BASED HOSPITAL PLACEMENTS

Lynda Cameron[1,2] , Janique Waghorn[1], Tasnim Rahman[1], Jignesh P. Patel[1]
[1] King's College London, London, UK [2] Guy's and St Thomas' NHS Foundation Trust, London, UK

A "fly on the wall" ethnographic-type study

Learning objective	Detail of what students should have achieved by the end of their 2-day placement in MPharm3
1	Have developed your skills in routine clinical pharmacy activities such as: • Medication-history taking • Monitoring the clinical, biochemical and haematological effects of drugs
2	Be able to discuss the pharmacological and therapeutic effects of key medicines, and how these should be used safely and effectively in patients
3	Be able to discuss the pathology, clinical manifestations and therapeutics of key diseases
4	Be able to discuss the pharmaceutical care of a patient with a chronic disease
5	Be able to discuss the pharmaceutical and clinical science essential to the practice of clinical pharmacy

Time spent with patients, and time with supervisors

Contact time between students and patients, and students their supervising pharmacist.

Introduction and Objective:
Experiential learning offers students a vital opportunity to contextualise and apply their classroom learning. The UK pharmacy regulator, the GPhC, plans to strengthen the emphasis on experiential learning as undergraduate pharmacy degrees are redesigned, to meet the needs of patients and the public in 21st century healthcare. This includes a focus on developing clinical and communication skills in a "near patient" environment.

At King's College London, pharmacy students undertake hospital-based placements with defined learning objectives (see above) during each year of their undergraduate MPharm degree. These placements are hosted by local teaching hospitals. Informal observation, as well as student feedback, had noted that patient contact on placement was on occasion limited. This ethnographic-type work therefor sought to understand more formally how time on placement was spent.

Method:
This work was a teaching and learning evaluation, meaning formal research ethics approval was not required. Students and their supervising pharmacists were informed that the observational work was being carried out, and had the opportunity to decline to take part if they so wished. Data collection and analysis focused on student activity, meaning patient consent to participate was not needed.

Using an approach drawing on ethnography, a final year pharmacy student observed the placement activities undertaken by three pairs of year 3 MPharm students. All were attending placements with the surgical pharmacy team at a London teaching hospital. Supervisors were qualified pharmacists undertaking their normal clinical duties. In total students spent six hours on placement: three hours on two consecutive afternoons. Data were collected using activity checklists derived from the pre-defined learning outcomes, and in the form of field notes. Data were analysed using a narrative approach.

Results:
Students were focused on finding a patient suitable for their university-based assessment within the first hour of their placement commencing. During the 6 hours on placement, students spoke with either one or two patients. Each pair of students spent over an hour noting down biochemical test results: at least double the length of time spent speaking with patients. Across all three pairs of students, there was consistently more time spent on the second day directly with their supervising pharmacist than on the first. In two cases students were asked to look further in to specific topics (gentamicin use, and management of Atrial Fibrillation) between the first and second day of placement. Logging on to IT systems, and disambiguation of medical abbreviations, were frequently noted as barriers to progressing with clinically-orientated tasks.
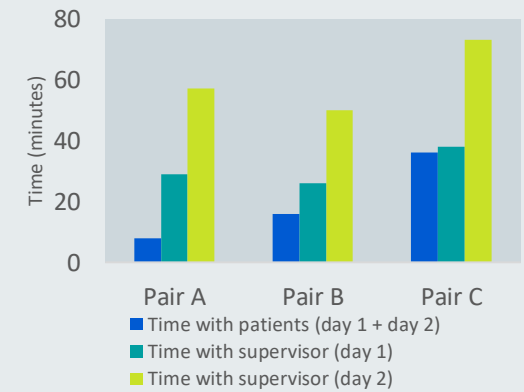
Conclusion:
This work is limited by the small sample size and by looking at only one pharmacy team in one hospital. The supervisor was a different person for each pair, and potentially relevant factors, such a supervisor attitude to education and training, or supervisor confidence in hosting students (which may increase over time) was not captured. However, across all pairs included, structuring placements over two days gave students an opportunity to look further into relevant topics between the first and second day. This was associated with a longer duration of time spent directly with the supervisor on day 2, allowing an opportunity for professional socialisation and embed contextual learning.

USE OF ENTRUSTABLE PROFESSIONAL ACTIVITIES FRAMEWORK FOR CLASSROOM-BASED ASSESSMENT OF CLINICAL REASONING FOR CLINICAL DECISION MAKING

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UNC ESHELMAN SCHOOL OF PHARMACY

BACKGROUND

- *Entrustable professional activities (EPAs)* are units of professional practice that describe the professional's unique abilities and work[1]
- *EPAs are gaining popularity in pharmacy education*
  - Trainee assessment of EPAs is based on the level of independence a supervisor can allow on journey to practice readiness[2]
- EPAs provide *support for students toward future professional roles* by presenting them with work that shapes their professional identity and builds a culture of self-reflection of their progress toward that professional role
- The *integrated pharmacotherapy (iPHTH) course series* is a vertically integrated, stepwise progression of pharmacotherapy delivery designed to ensure that students achieve demonstrably high levels of knowledge, clinical skills, and clinical reasoning abilities

OBJECTIVE

To assess the incorporation of EPA assessment of clinical reasoning and clinical decision making within a three course integrated pharmacotherapy series in order to track the progression of students to practice ready

METHODS

- Immersion experiences are imbedded in the curriculum beginning after the first year (see Figure 1)
- Deliverables for the course series include written assessments
  - Clinical Decision Making Summary (CDMS) are used to assess learning and provide feedback
- Students were assessed on each step of the CDMS using the entrustable professional activities (EPA) assessment tool: 1 = Dependent; 2 = Assisted; 3 = Supervised; 4 = Independent; 5 = Supervise others
- EPA level of entrustment for the classroom assessment (CDMS) was defined based on subsequent immersion expectations (see Table 1)
- EPA assessed: Utilize evidence-based approach to advance patient care (see Table 1 & 2)

METHODS (CONTINUED)

Figure 1: Schematic of Classroom and Experiential Curriculum*
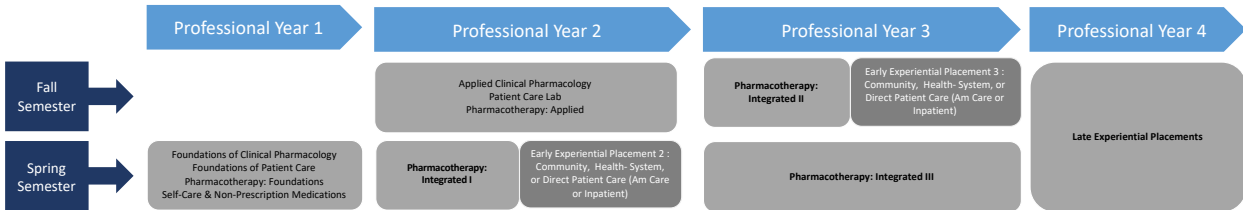
*Preparatory courses for iPHTH occur in the Spring semester of Professional Year 1 and Fall semester of Professional Year 2. Early Experiential Placement 1 occurs in the summer after Professional Year 1

Table 1: EPA entrustment expectations in iPHTH*

CDMS Assessment Component	Early Experiential 2	iPHTH I Expectation	Early Experiential 3	iPHTH II Expectation	iPHTH III Expectation	Late Experiential
Overall Impression	Assisted (2)	Assisted (2)	Assisted (2)	Assisted (2)	Supervised (3)	Supervised (3)

*Level of expectation for classroom-based assessments was matched to the corresponding early (iPHTH I-II) or late (iPHTH-III) experiential expectation

RESULTS

Table 2: EPA entrustment assessment in iPHTH [mean +/- SD]

CDMS Assessment Component	Class Cohort	iPHTH I Assessment	iPHTH II Assessment	iPHTH III Assessment
Overall Impression	Class 1	2.2 ± 0.7	2.9 ± 0.6	3.0 ± 0.6
	Class 2	1.9 ± 0.3	2.4 ± 0.5	3.0 ± 0.4

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1. Pittenger AL, Chapman SA, Frail CK, Moon JY, Undeberg MR, Orzoff JH. Entrustable professional activities for pharmacy practice. Am J Pharm Educ 2016;80(4):57.
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CONCLUSIONS

- EPA level of entrustment application to classroom based learning was implemented
- Based on the defined entrustment expectations for iPHTH, on average students met (iPHTH I & iPHTH III) or exceeded (iPHTH II) the level of expectation
- Continued education of faculty evaluators using the EPA scale is needed as this is a new approach in pharmacy to assessing students

Current and emerging patterns of pharmacist pre-registration training in Great Britain

Damian Day, Head of Education, General Pharmaceutical Council

1. *Study objective*

To establish whether multi-sector pharmacist pre-registration training is expanding in GB and, if it is, how it is affecting the training experience

2. *Design:* analysis of -

- Multi-sector pre-registration training places in a national application scheme, Oriel (excludes those outside the scheme and in Scotland)
- Multi-sector pre-registration training plans
- Evaluations of multi-sector training pilots

3. *Results*

- There has been a significant expansion in multi-sector pharmacist pre-registration training in Great Britain (from c.30 places historically to 248 in 2018-2019 (and rising)), supported by national initiatives in England and Wales
- Historically, multi-sector training placement numbers have been low, comprising 1. Industry paired with either Hospital or Community and 2. Hospital paired with Community
- The main growth has been in GP Practice placements paired with either Hospital or Community placements
- Some schemes are serial (using adjacent block of training in 2/3 sectors), some are in parallel (training in 2/3 sectors every week)
- Initial analyses of pilots report that multi-sector trainees are: 1. well rounded (with a better understand of a range of other healthcare professionals), 2. more flexible (having trained across sectors), 3. more confident decision makers (drawing on wider experience than

Pharmacist pre-registration training places in England and Wales 2018-2019 (in Oriel application scheme)

Single sector training – 88%
Multi-sector training – 12%

Community/GP Practice – 52%
Hospital/GP Practice – 33%
Hospital/ Community – 15%
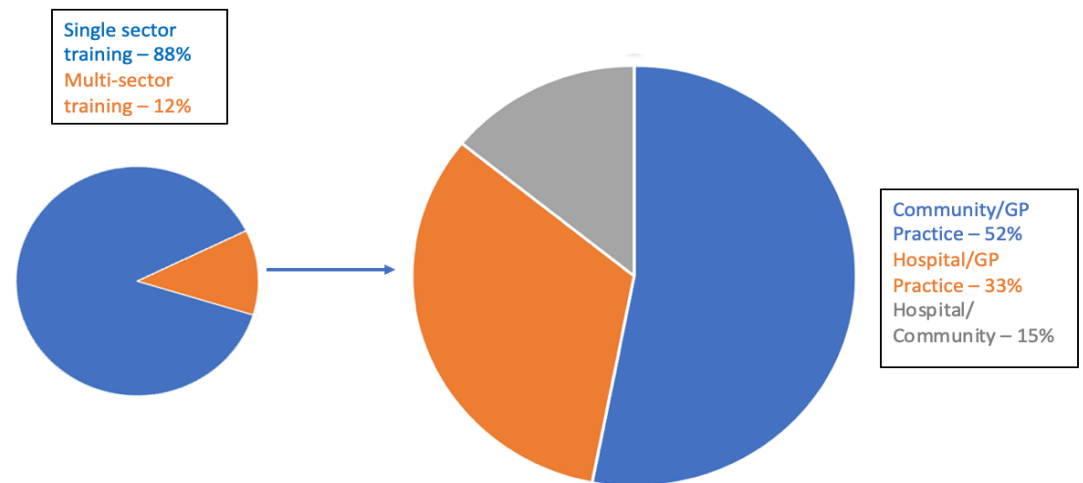
single sector trainees) and 4. effective communicators. Blocks of training have been added to later iterations of parallel schemes to provide continuity at key points

4. *Conclusion*

- There has been a significant (and increasing) expansion of multi-sector pharmacist pre-reg places in GB (reflecting an increase in multi-sector clinical working by pharmacists)
- Multi-sector training including GP Practices represent the bulk of the growth
- Multi-sector training is producing more adaptable and communicative trainees who draw on a breadth of experience not available to single sector trainees

LAPTOP VERSUS LONGHAND NOTETAKING: IMPLICATIONS FOR PRIMARY LANGUAGE AND FOREIGN LANGUAGE SPEAKERS

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OBJECTIVES

1) Determine the relationship between longhand (LH) notetaking versus laptop (LT) notetaking and pharmacy students' exam performance
2) Identify differences in test performance between native English speakers (EPL) and students for whom English is a foreign language (EFL)
3) Describe differences in attitudes and behaviors in notetaking among students enrolled in a pharmacy health systems course

METHODS

Longhand vs. shorthand Students in the intervention (LH) group (n = 11) utilized only paper & pencil to take notes. Student performance on subsequent exams were compared across the two groups (n = 75 LT motetakers) and against performance on the first exam.

EPL vs EFL English primary language students (n= 49) were compared on performance across all three examinations versus those self-designating as EFL (n = 37).

Behavioral/Attitudinal Survey Students completed a self-administered survey of notetaking & studying strategy behaviors after completing the course.

Notetaking Attitudes/Behaviors

My attention span limits how much I understand during lecture.
- Laptop: 4.53
- Longhand: 3.44

I found myself getting easily distracted during class.
- Laptop: 3.78
- Longhand: 2.33

I was satisfied with completeness & accuracy of my notes.
- EFL: 2.01
- EPL: 2.98

Sometimes I get distracted by neighbors' keyboard typing.
- EFL: 3.65
- EPL: 2.14

Other students ask to look at my notes b/c of their quality.
- EFL: 3.27
- EPL: 4.28

Exam Scores Among Groups

- 87.2
- 83.0
- 85.9
- 74.7

■ LH notetakers
■ LT notetakers
□ EPL
■ EFL
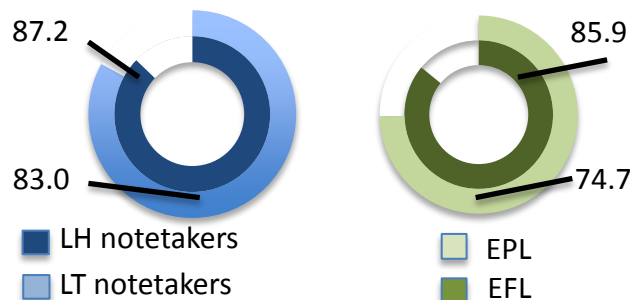
SUMMARY OF RESULTS

Subsequent block exam scores favored LH notetakers (p = 0.1) and EPL students (p < 0.01). LH reported taking fewer notes, being less easily distracted, & more likely to begin encoding during class. EFL students were less satisfied with the quality of their notes and reportedly less likely to have students borrow their notes.

SELECTED QUOTES FROM LH

"I think my grade improved b/c I learned how to better study." "Encourage other students to try it. I use different colored pens, and that is very helpful." "Didn't have to think about connectivity, malfunctions, or other problems." "It reduced the total time I needed to study for exams."

CONCLUSIONS

1. Faculty can consider these results in the pedagogical delivery & assessment in a diverse classroom.
2. Faculty should promote varied, effective notetaking strategies.
3. University & college administrators might reconsider student recruitment & also provide adequate support.

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OBJECTIVE STRUCTURAL CLINICAL EXAMINATION AS ASSESMENT METHOD IN THE COURSE PHARMACOTHERAPY IN SELF-TREATMENT

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Objective: To strengthen the students´ communication skills and better evaluate whether they can apply their theoretical knowledge when advising a customer in the pharmacy, by changing the assessment method to an Objective Structural Clinical Examination (OSCE).

Method: The examination in a 9 credit course in pharmacotherapy for self-treatment was changed from a traditional written exam to an OSCE, i.e. an oral exam based on role play[1]. Assessment criteria were developed and tested. The OSCE consisted of three different stations ("pharmacies") where the students met a customer which was played by a teacher. Another teacher in the room evaluated the interaction with the customer and asked follow-up questions. After three days of OSCE-sessions, the students´ three performances were weighted with an overall grade. Both theoretical knowledge regarding non-prescription drugs and distinction between self-treatment and healthcare, as well as communication skills, were taken into account in the grading. In order to pass the course, the student had to perform sufficiently well within all areas above.

Results: The students found the assessment form relevant and authentic although some of them claimed that nervousness was a problem. The distribution of grades was in line with prior semesters. However, some students failed the exam solely based on inadequate communication skills. The participating teachers have all been very positive and believe that this project has led to a more relevant assessment method for this course, a method where the students´ communication skills can be evaluated to a greater extent. The assessment method affects the way students focus their learning and their ability to communicate has been strengthened since the assessment change.

Conclusion: The change of assessment method has led to enhancement of the communication skills, thus making students better prepared for their future profession.

1. Kirton, S.B. & Kravitz, L. (2011). Objective structured clinical examinations (OSCEs) compared with traditional assessment methods. Am J Pharm Educ, 75(6): Article 111

ASSOCIATIONS BETWEEN PHARMACY PREREQUISITES AND OSCEs AT THE UNIVERSITY OF SASKATCHWAN

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Objective: To identify academic prerequisites associated with interactive and non-interactive Objective Structured Clinical Examinations (OSCE) performance in the undergraduate pharmacy program at the University of Saskatchewan (U of S).

Design: Retrospective data consisted of the final grades of prerequisite courses and OSCE scores of 1183 students admitted to the undergraduate pharmacy program of the U of S from 2003 to 2017. Interactive and non-interactive OSCE scores from four sets of OSCEs in years 3 and 4 of the pharmacy program (Phar 465 and Phar 565) were calculated. Associations between OSCE scores and prerequisites were analysed using Pearson correlation and stepwise linear regression.

Results: Few significant correlations seen between the BSP prerequisites and OSCE scores. A large number of statistically significant correlations found with the Pharm D prerequisites; however, these correlations were uniformly weak (0.10 to 0.20). Courses in Biochemistry, Math, Microbiology, Nutrition, and Physiology showed the strongest association with interactive OSCEs. The strongest associations with non-interactive OSCEs seen with Math, Microbiology, and Statistics. Linear regression analysis produced very weak explanatory models.

Conclusions: OSCEs assess a range of clinical skills including verbal communication, professional judgement, application of knowledge, and problem solving ability; thus, OSCEs might serve as an important proxy for measuring future clinical success (McLaughlin et al, 2015). Our previous research identified strong associations between persistent academic success in the pharmacy program and prerequisites seen to require higher-level learning skills such as knowledge organization, skill mastery and knowledge synthesis and application (Krol, Dobson & Adesina, 2019). The weakness of the associations between the prerequisites and OSCEs, while consistent with other findings in the literature, suggests limits to the scope of clinical and problem-solving skills currently assessed at the U of S (and possibly other training centres) as they relate to higher-level learning.

References

Krol, E., Dobson, R & Adesina, K. (2019). The Association between Academic Success in a Professional Pharmacy Program and Performance in BSP and Pharm D Prerequisites at the University of Saskatchewan. American Journal of Pharmaceutical Education. DOI: 10.5688/ajpe6491.

McLaughlin, J., Khanova, J., Scolaro, K., Rodgers, P., & Cox, W. (2015). Limited predictive utility of admissions scores and objective structured clinical examinations for APPE performance. American Journal of Pharmaceutical Education, 79(6), 1-7.

Associations between Interactive OSCE scores and Pharmacy Prerequisites (BSP and Pharm D)

Third and Fourth year OSEC Examinations		Original BSP Prerequisites				Additional Pharm D Prerequisites						
		Biology	General Chemistry	Languages	Organic Chemistry 1	Biochemistry	Math	Microbiology	Nutrition	Organic Chemistry 2	Physiology	Statistics
Phar 465 Clinical Skills	Correlation	.009	.030	.115	.043	.184	.151	.192	.171	.118	.093	.054
	Sig. (2-tailed)	.845	.528	.016	.346	.000	.001	.000	.000	.001	.015	.156
	N	460	450	434	476	534	482	683	824	790	694	685
Phar 465 OSCE Final	Correlation	.103	.131	.118	.097	.191	.156	.218	.193	.129	.217	.148
	Sig. (2-tailed)	.027	.005	.014	.033	.000	.001	.000	.000	.000	.000	.000
	N	461	451	435	477	538	484	688	827	794	700	689
Phar 565 Clinical Skills	Correlation	.072	.112	.062	.096	.175	.194	.157	.134	.144	.109	.104
	Sig. (2-tailed)	.148	.027	.228	.050	.000	.000	.000	.000	.000	.006	.009
	N	403	393	380	418	492	424	627	747	717	629	624
Phar 565 OSCE Final	Correlation	.039	.001	.067	.034	.102	.099	.149	.137	.081	.106	.093
	Sig. (2-tailed)	.432	.982	.190	.482	.024	.042	.000	.000	.029	.008	.020
	N	403	393	380	418	492	423	628	748	718	631	625

Associations between Non-Interactive OSCE scores and Pharmacy Prerequisites (BSP and Pharm D)

Third and Fourth year OSEC Examinations		Original BSP Prerequisites				Additional Pharm D Prerequisites						
		Biology	General Chemistry	Languages	Organic Chemistry 1	Biochemistry	Math	Microbiology	Nutrition	Organic Chemistry 2	Physiology	Statistics
Phar 465 Clinical Skills	Correlation	.094	.115	-.002	.065	.123	.184	.273	.117	.038	.092	.135
	Sig. (2-tailed)	.142	.078	.973	.300	.023	.004	.000	.008	.399	.062	.004
	N	245	237	225	259	344	244	466	513	490	410	456
Phar 465 OSCE Final	Correlation	.014	.016	-.059	-.011	.062	.064	.114	.081	.037	.006	.015
	Sig. (2-tailed)	.769	.733	.222	.816	.154	.161	.003	.019	.301	.882	.700
	N	461	451	435	477	537	484	687	826	794	700	689
Phar 565 Clinical Skills	Correlation	-.033	-.061	-.005	-.008	.006	.157	.109	.005	.049	.050	.042
	Sig. (2-tailed)	.646	.395	.952	.909	.917	.030	.042	.917	.313	.362	.399
	N	198	194	181	214	290	189	413	429	420	338	399
Phar 565 OSCE Final	Correlation	.012	.057	.004	.096	.102	.089	.006	.108	.084	.049	.110
	Sig. (2-tailed)	.814	.285	.935	.059	.033	.069	.881	.005	.033	.240	.009
	N	361	352	344	374	439	414	565	671	646	577	564

"I'VE ENJOYED IT… I'D CHOOSE TO DO IT AGAIN…": EVALUATION OF AN INNOVATIVE MULTI-SECTOR PRE-REGISTRATION PHARMACIST TRAINING PROGRAMME IN WALES

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Alison Bullock, Cardiff Unit for Research and Evaluation in Medical and Dental Education, Cardiff University, UK.

Background

Following evaluation of the initial pilot of a multi-sector pre-registration training programme in North Wales, this unique training scheme was extended across Wales. A number of pre-registration pharmacists in Cwm Taf, Betsi Cadwaladr and Hywel Dda University Health Boards were exposed to hospital, community and primary care pharmacy environments, with varying durations/structures in the training year 2017-2018.

Objective

To evaluate a unique pharmacist pre-registration training programme, whereby trainees are exposed to hospital, community and primary care pharmacy environments on a rotational basis of varying durations/structures.

Methods

Semi-structured telephone interview schedule designed & ethical approval gained.

→

Twenty six participants who followed the multi-sector programme (n=10) and their tutors (n=16)

↓

One interviewee withdrew consent. Data from twenty five interviewees were analysed thematically.

←

Interviews were conducted and recorded before being transcribed ad verbatim.

Results

Four themes were identified:
Benefit 1: Importance of tutor and trainee factors for programme success
Benefit 2: The added value of the multi-sector pre-registration programme
Benefit 3: Lack of consensus on "ideal" programme structure
Benefit 4: Suggestions for improvement

Tutor: "…they [multi-sector trainees] do have this very holistic view of the patient that you don't get at the single sector"

Trainee: "It [multi-sector training programme] was a really good opportunity to see how the different sectors work and to become confident and competent in all sectors of pharmacy as just opposed to just being confident in one"

Conclusion

This study provides an insight into the perceptions of multi-sector pre-registration pharmacists and their tutors towards the multi-sector training programme in Wales. Participants reflected upon the benefits of the programme in comparison with a single sector scheme including the opportunity to shadow a range of pharmacists and other healthcare professionals, develop a "well-rounded" knowledge, an appreciation of transfer of patient care between settings and a better understanding of all sectors of pharmacy in order to make an informed career choice. Areas for improvement, such as the need to introduce trainees to the hospital ward environment from an earlier time point as well as improve communication between tutors, were highlighted.

Coleg Cymru Cenedlaethol

GIG CYMRU NHS WALES | Addysg a Gwella Iechyd Cymru (AaGIC) Health Education and Improvement Wales (HEIW)

THE FUTURE OF NUTRITION IN PHARMACY EDUCATION: KNOWLEDGE AND PERCEPTION OF UNDERGRADUATE PHARMACY STUDENTS

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[1]Monash University, Sunway, Malaysia, [2]International Medical University, Bukit Jalil, Malaysia

Objective: Optimizing student learning in relation to nutrition is essential to ensure relevant nutrition advice to public health. Hence, we conducted an exploratory study to assess the knowledge of final year undergraduate pharmacy students of various aspects of nutrition.

Design: A 30-single best answer multiple choice item was developed as an informal assessment to evaluate students' knowledge of basic nutrition principle and their ability to put this knowledge into practical advice. The questions were developed in form of case scenarios in a direct patient care setting taking into account the practice need and competency of entry-level pharmacists. Students also received feedback about their answers to support their learning and professional development. An informal discussion was involved in which students share their thinking about their learning experience and the preference to learn more about nutrition.

Results: Students performed significantly better on the question that address general nutritional advice and questions pertaining to healthy pregnancy and breastfeeding, but not on questions that require clinical application specifically in cardiovascular cases. About 75% of the cohort agreed that they would like to learn more about nutrition.

Conclusion: Because of an increasing emphasis on prevention of chronic disease development, students must be able to identify and assess dietary risk factors associated with the development of these illnesses. Moreover, students need to acquire and develop motivational counselling and referral abilities. Our results suggest the need for a multidisciplinary educational initiative to develop nutrition education competencies and curricula for pharmacy program considering best practices and patients outcomes. The inclusion of nutrition in students' training at all levels is necessary to maintain a focus on its critical role in patient care.

ASSESSMENT OF MENTAL HEALTH FIRST AID SKILLS THROUGH SIMULATED PATIENT ROLE-PLAYS WITH MENTAL HEALTH CONSUMERS: RUBRIC DEVELOPMENT AND RELIABILITY TESTING

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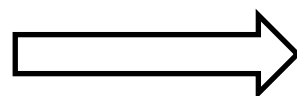
Improvements in *self-reported* confidence in supporting people experiencing crises (e.g. suicide)[1]

Do actual behaviours improve?

RATIONALE	METHODS	RESULTS
• MHFA is integrated into the BPharm curriculum • Post-MHFA training, students are assessed based on simulated patient role-plays with consumers with lived experience (6 cases) • Assessment is marked using a 12-item rubric developed based on the MHFA Action Plan[2] • **Is the newly developed rubric reliable?**	**Interrater reliability** • Each student role-play is marked by 3 raters (tutor, consumer and student) • Fleiss Kappa (pass/fail) • ICC of item scores (0-2) and overall scores (0-24) **Test re-test reliability** • Audio recordings marked twice, four weeks apart • Pearson's correlation	**Fleiss Kappa (n=96)** • Combined cases: 0.571 (p<0.001) • Per case: -0.038-0.822 **ICC (n=96)** • Combined cases: 0.703 (CI: 0.577-0.795) • Per item: -0.552 to perfect agreement **Pearson's correlation (n=58)** • Combined cases: 0.868 (p<0.001) • Per case: 0.774, p<0.001; 0.815, p=0.093; 0.868, p<0.001; 0.955, p<0.001 for each case

CONCLUSIONS:

• Interrater and test re-test reliability of the rubric was high, for combined cases, while differences across cases informed modifications to the cases and items.

• A limitation of the study was the unequal distribution of participants to each case.

• Simulation allows participants to demonstrate how they would apply their newly acquired skills, post-training, and should accompany self-report evaluations[2].

1. Morgan AJ, Ross A, Reavley NJ. PLoS One. 2018;13(5):e0197102. 2. El-Den S, Chen TF, Moles RJ, O'Reilly CL. AJPE. 2018;82(2):Article 6222.

DESIGN. DEVELOP. TEACH. REPEAT.

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MONASH University

8 | WORKING WITH OTHERS 6 | LEADERSHIP DEVELOPMENT 1 | ACADEMIC CAPACITY 2 | FOUNDATION TRAINING

OBJECTIVE

To describe the process undertaken to design, develop and deliver a foundational unit within the new Vertical Integrated Masters of Pharmacy degree (VIM degree) at the Faculty of Pharmacy and Pharmaceutical Sciences at Monash University.
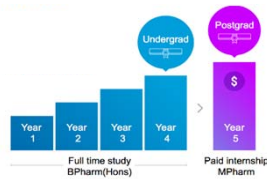

POWER IT – INQ

Problem-solving
Oral communications
Written communications
Empathy
Reflective practice
Integrity
Teamwork
INQuiry

- **Monash's new Vertical Integrated Masters course in Pharmacy.**
- **The innovative curricula design is centred around key elements with descriptive titles such as how the body works, how medicines work, comprehensive care, professional practice, inquiry and experiential placements.**

DESIGN

The Faculty of Pharmacy and Pharmaceutical Sciences at Monash University strategically redesigned the Pharmacy curriculum to better align with the needs of the profession.

A key feature of the VIM degree is skill development such that students learn to be critical thinkers, problem solvers, excellent communicators and team players. Units were purposefully restructured to adopt a student centred learning approach.
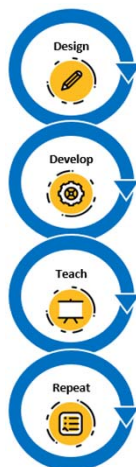
Design
D | Discover - Preparatory learning
E | Explore - Interactive lectures
A | Apply - Small group workshops
R | Reflect - Personalised learning plans

Develop
- Assistant lecturer support.
- Content developed by the academic team converted to online platform.

Teach
- Scheduled release of preparatory material.
- Interactive lectures replace didactic lectures.
- Workshops with a focus on student centred learning.

Repeat
- Various form of feedback was used to further develop the unit.
- Unit evaluations
- Academic and student feedback.

RESULTS

*** p < 0.001 (2 tailed t test)
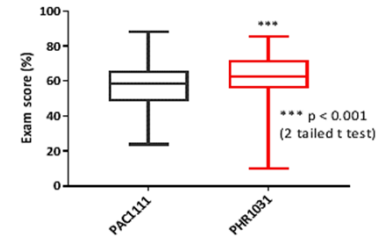
Comparison of short answer question exam results of students enrolled in PAC1111 in 2016 (established pharmacy degree, n = 192) and PHR1031 in 2017 (integrated masters in pharmacy, n = 185).
Both exams were similar in terms of difficulty, as measured by the percentage of questions in the short answer sections that were higher order in terms of Bloom's taxonomy (48% for PAC1111 compared with 51% for PHR1031) (Dan Malone, 2017)

Results 1: Exam and unit results were noticeably higher than the previous year.

SETU (semester 1) comments regarding Discovery, Interactive lecture or Workshop, coded as positive or negative. Combined data for PHR1011, PHR1021, PHR1031
(Paul White, 2017)

Which aspect(s) of this unit did you find most effective?
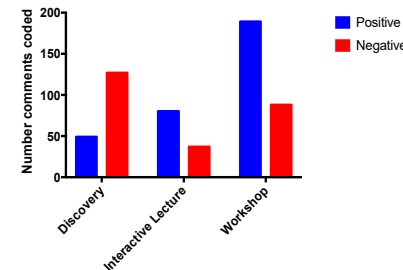
- *'I like that we were given opportunities during the interactive lectures to attempt questions and scenarios that are relevant to the learning material. I find the workshop activities very useful. I also like that all the contents are available on moodle, so I can come back and have a look at any time.'*
- *'the discovery material was really helpful. the interactive lectures were also good as they went through the discovery material and explained the questions. overall, HTBW lectures were engaging. the workshops, that relied on group work were useful as helpful as we all helped each other. '*

Would you suggest any changes to enhance this unit in the future?

- *'Reduce the amount of discovery that is mainly explained through text alone, and incorporate other visual aids that are integrated nicely and thoroughly explained.'*
- *'Perhaps going over the pre-learning materials for discovery in the interactive lectures would be more effective in helping us understand the concepts. This way, we can consolidate our understanding from discovery, rather than just be taught new concepts that we are not yet confident with.'*

Results 2: Students provided meaningful feedback

CONCLUSION

Utilising a different teaching approach new units were developed as part of the new Pharmacy curriculum which focuses on skill development. Feedback obtained from staff and students this year will be used to further develop the unit in 2020.

DEVELOPMENT OF A VISUALIZATION AND ANALYTICAL METHOD OF THE PHARMACY CURRICULUM AT THE UNIVERSITY OF PÉCS, HUNGARY

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Faculty of Pharmacy, University of Pécs, Hungary

PÉCSI TUDOMÁNYEGYETEM
UNIVERSITY OF PÉCS

Objectives	Logical arrangement of the pharmacy curriculum is essential for the effective educational process. We aim to collect and summarize prerequisites of obligatory subjects, data on student dropout rate, and integrate all relevant information in a visual map. Such decision support and quality management tool will help the Faculty management and subject directors to further develop our curriculum and optimize prerequisite subject structure.
Methods	Prerequisites of obligatory subjects were exported to various software aiming to visualize the networks of our curriculum. Dropout rates were collected from the electronic administration system (Neptun).
Results	A curricular system can be considered as a graph containing nodes (subjects) and edges (prerequisites). Our 10 semester one-tier master curriculum is highly complex, as the 70 obligatory subjects have more than 110 prerequisites. Visualization in MS Project as a Gantt chart makes visual interpretation difficult. Network analysis and visualization software (eg.: Gephi), was also an inadequate tool to visualize the timeline of education. Key subject specific components (credit value, subject code, semester, module, prerequisites, etc.) and educational properties (e.g.: failure rate, students' feedback on education) have been identified, and are planned to be integrated into our methodology.
Conclusion	A network analysis and visual presentation of the required subjects of pharmacy curriculum require an individual software developed to meet our expectations and needs. Applying such novel method will likely improve curriculum structure and reduce dropout rate by identifying critical subjects with high number of prerequisites and high failure rate.

Fig. 1.: Visualization in MS Project as a Gantt chart
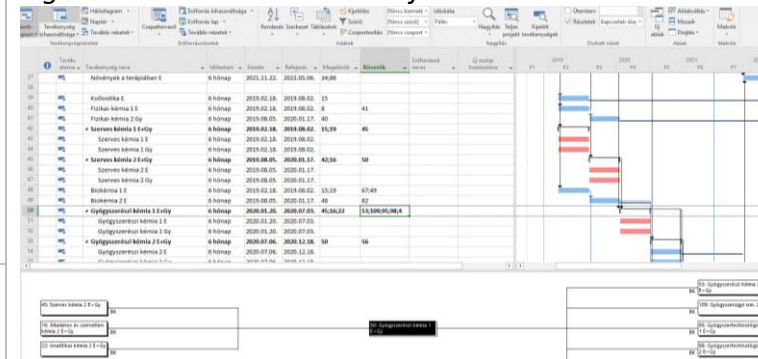
Fig. 2.: Graph visualization in Gephi
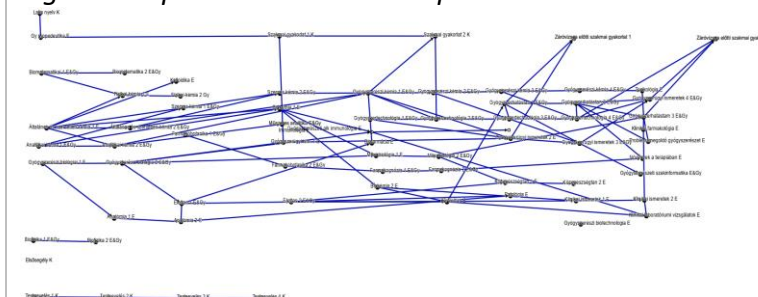
Fig. 3.: Failure rate categories of an evaluated subject
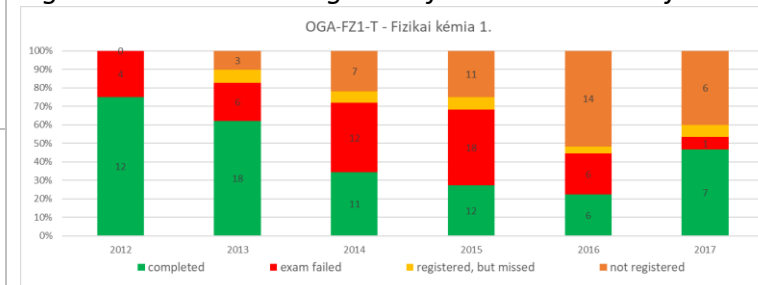
OGA-FZ1-T - Fizikai kémia 1.

completed   exam failed   registered, but missed   not registered

APPLICANT PREFERENCING OF TRAINING PROGRAMMES IN THE NATIONAL PRE-REGISTRATION PHARMACIST RECRUITMENT SCHEME FOR ENGLAND AND WALES: APPLICANT BEHAVIOUR AND ASSOCIATED FACTORS IN THEIR DECISION MAKING

Laura McEwen-Smith[1], **Gail Fleming[2]***, Tim Swanwick[1], Christine Hirsch[2], Sharon Buckley[2], Asma Yahyouche[2], Jonathan Ward[2], Malcolm James Price[2], Vibhu Paudyal[2]
[1]Health Education England [2]Royal Pharmaceutical Society [3]University of Birmingham

Objective
A centralised system for recruiting to all hospital preregistration pharmacist training and majority of community pharmacy posts based in England and Wales was introduced in 2017. Applicants submit a single application and are allocated their highest preferenced training place, based on their performance in selection centres. This evaluation explored applicant preferencing of their future employers and factors influencing their behaviour.

Design
The study was undertaken in three phases:
- Preferencing data from all applicants (n=2694) of the 2017 national recruitment cycle were analysed
- A cross-sectional online survey of all students in England and Wales undertaking Master of Pharmacy Year 4 who were eligible applicants of the 2017 application cycle
- Survey was followed by qualitative focus groups and telephone interviews

Data collection tools designed based on literature, theoretical domains framework (TDF) and expert opinion of evaluation steering committee. Descriptive and inferential analysis of quantitative data was undertaken. The framework technique was used to analyse the qualitative data.

Results
The majority (n=2325, 86%) of applicants preferenced pre-registration programmes across both hospitals and community pharmacy sectors.
A total of 283 (11%) and 86 (3%) applicants respectively only preferenced pre-registration programmes in either hospital or community pharmacy sectors respectively. 2182 (83.9%) applicants ranked hospital pre-registration programmes as their first ranked preference. London was the most popular geographical area with approximately 4 in 5 applicants preferencing at least one programme. Ethnic variations as well as differences across applicants from different Schools of Pharmacy were identified. A total of 307 responses were received from the survey (response rate 11%). A third expressed dissatisfaction with the preferencing process. Participants indicated high satisfaction with the provision of information about preferencing at presentations and events runs by the Universities and HEE.

Conclusions
This evaluation has demonstrated a high affinity of pharmacy students for pre-registration pharmacist training programmes in hospitals. Long term career aspirations were very important as were favoured geographical areas. These findings highlight the need for community pharmacy employers to enhance their marketing strategies including the quality of information available to students about their programmes. The preferencing process itself can be improved by widening the timeframe and improving information on the geographical location of training places.

PEER-ASSISTED LEARNING – A LEARNING OPPORTUNITY AND A LIFE HACK?

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1 - University of Reading, Berkshire, United Kingdom, 2 - Newcastle University, Newcastle Upon Tyne, United Kingdom

INTRODUCTION

Peer-assisted learning (PAL) focuses on facilitating learning. Students in the same subject learn together with their peers, facilitated by trained student facilitators in the year above. A pilot PAL scheme was introduced at Reading School of Pharmacy.

OBJECTIVE

To describe the implementation and evaluation of a peer-assisted learning (PAL) pilot scheme at a pharmacy school in the UK.

DESIGN

Pharmacy academics and the PAL co-ordinator designed and implemented the pilot scheme in pharmacy.

The PAL co-ordinator trained PAL leaders (see Figure 1).

METHOD

Evaluation included questionnaires and one-to-one interviews with PAL learners and a focus group with PAL leaders.

RESULTS

Learners

- Fun and interactive; encouraged collaborative learning

- Less formal and provided a relaxed atmosphere

- Increased confidence to ask questions (basic and complex concepts) and reduced pressure to answer correctly

- Increased understanding of subject area

- Some were less comfortable with the less structured format

Leaders

- A "milestone" in their personal development and a valuable addition to their *curriculum vitae*

- Additional skills and experiences gained/enhanced: leadership, teamwork, facilitation, inter-personal relations and communication

- Consolidated own learning

Figure 1: PAL training session

FUTURE WORK

Additional subject-specific support and learning from past PAL leaders.

CONCLUSION

- The successful pilot provides an evidence base for future implementation of the scheme.

- There is scope to extend the topic areas covered within PAL.

- PAL provided a different and innovative approach to teaching and learning; students and academics assume different 'roles' and this model showed benefits in a pilot PAL scheme in pharmacy.

Contact information

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DEVELOPMENT PROGRAMS GIVING BACK TO THE WORKPLACE – IT'S NOT JUST THE LEARNERS WHO ARE STILL LEARNING

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Background

Launched in 2017, the **SHPA Foundation Residency** program provides structured foundation training to new-to-hospital pharmacists

SHPA works in partnership with workplaces to deliver this 2 year program

We know that employers can be hesitant to commit to workplace-based learning initiatives due to operational pressures

During site accreditations (17 so far) we identified some **unexpected benefits** to the workplaces, beyond improvements to the Residents' performance

Aim

To describe how participation in the SHPA Foundation Residency has delivered spontaneous benefits for participating hospitals, both planned and unplanned.

Results

Examples of benefits for participating organizations include:

- A hospital using the Residency program to **build interdisciplinary links** with a medical unit they previously had little interaction with. By deploying a Resident rotation to the unit, and asking for support with the Resident's research, a relationship was formed between departments

- Numerous hospitals describe using the Residency to formalize parts of their **workforce planning.** Prior to taking part in the program, they had an ad-hoc approach to recruitment, often resulting in a sub-optimal staff mix. The Residency compelled them to consider their capacity for junior staffing, and they were able to plan for this mix going forward

- One very experienced pharmacist who had reported being traditionally uninterested in management and supervision was obliged to take part, and reflected on improvement in this part of their practice

- One rural hospital built a formal link with a metropolitan site, hosting residents for a 6 month rotation. This hospital traditionally carried vacancies, and the rotating resident filled one of these slots as a hospital trained staff member, reducing recruitment effort

Conclusion

We had anticipated that the Residency Program would improve performance of the residents themselves, and in turn, their patients' care.

In addition, we are finding that workplaces are able to, deliberately and otherwise, utilize their participation in this structured development pathway to obtain workplace improvements.

This serves to remind us that participation in structured clinical education programs can improve the functioning of workplaces, beyond the expected benefits to learners, despite the potential short-term operational difficulties.

For more information on the SHPA Foundation Residency visit:

www.shpa.org.au/residency-and-residents

shpa

University of South Australia | School of **Pharmacy and Medical Sciences**

STUDENTS' EXPECTATIONS AND PERCEPTIONS OF WEB-BASED PHARMACY EDUCATION AND PHARMACY PROFESSION

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Objectives The objective of this study is to describe first year pharmacy students' expectations and perceptions of a web-based pharmacy program and of their future pharmacy profession.

Method A study questionnaire was developed based on the results of focus group interviews with students admitted to pharmacy programs at Umeå University in Sweden. The questionnaire was distributed to all first-year students admitted to these programs in 2017 (n=66). The response rate was 71%.

Results The most important factors to the students when choosing their education were that the education is interesting, leads to an interesting job and is web-based. From the analysis of the question "What are your expectations concerning your education?" two broad themes were identified: learning skills and being prepared for the future profession. From the analysis of the open-ended responses to the question "What are your expectations concerning the future profession?" three broad themes were identified: helping other people, professional development and employment related issues.

Conclusion For the students, educational choice seems to be associated with personal interests and motivations. Their expectations of their future pharmacy profession are related to helping people rather than getting a high salary and making a career. Knowledge about students' expectations and perceptions of their pharmacy education and future pharmacy profession is important when seeking strategies for educational development.

Figure 1. Umeå University

UMEÅ UNIVERSITY

Department of Pharmacology and Clinical Neuroscience, Umeå University, SE-90187 Umeå, Sweden

AN EVALUATION OF A CERTIFICATE IN BUSINESS ADMINISTRATION (CBA) PROGRAMME FOR MPHARM STUDENTS

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University of Reading

Objectives

In 2015, the School of Pharmacy launched a CBA programme for students to undertake alongside their MPharm; taught by Henley Business School as 3 summer school modules over 2 to 3 years.
- To evaluate student perceptions of the new CBA programme
- Identify reasons for students enrolling on the programme

Design

CBA students (n=24) → Online validated student experience survey[1] → 79% response rate (n=19)

CBA graduates (n=4) → Semi-structured telephone interviews → 25% (n=1) participation

Enrolled MPharm students (n=497) → Peer-led focus groups → 1.6% (n=8) participation
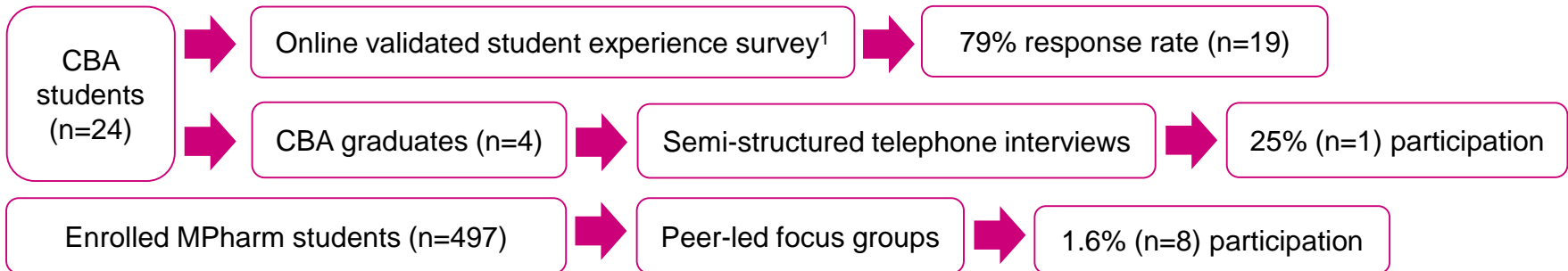
1. Wilson, K. L, Lizzio, A. & Ramsden, P. (1997). The development, validation and application of the Course Experience Questionnaire. Studies in Higher Education, 22, 33-53.

Results

Perceptions of programme
Majority of participants:
- Satisfied with programme
- Agreed their business skills had improved
- Agreed that other skills such as analytical, team-working and written communication skills had improved

Reasons to enrol
Opportunity to 'stand out from the crowd'
Potential learning:
- People management
- Leadership

Barriers to enrolment
Additional cost of CBA modules

Limitations
Low engagement with focus groups and telephone interviews

Conclusion

- Students reported perceived benefits of the programme
- To widen access to these benefits and reduce the financial barrier, core modules are now included in the MPharm
- The full PG Cert option is still available for those that want to 'stand out from the crowd'

ENTRUSTMENT DECISIONS IN UNDERGRADUATE HOSPITAL PHARMACY PLACEMENTS - INFLUENCES AND OPPORTUNITIES

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Objective: To describe entrustment decisions during placements in the hospital pharmacy workplace and evaluate factors that influence these.

Study Design: All 3rd year MPharm students at the University of Bath undertook a week placement in a hospital setting. Students completed an online survey to investigate the tasks they undertook on placement and factors associated with their perceived level of confidence and competence. Students were asked specifically to describe the level they performed set tasks at, using a defined set of criteria, and were then asked to comment on the level of entrustment given by the supervisor on placement. Students were asked to describe the factors that they thought influenced this. Results were analysed using SPSS.

Results: Students described their performance over a range of 25 tasks (8.1-10.7). 19 (76%) of the tasks showed a significant difference between students perception of their level of competence and that of their supervisor and that they felt they were capable of performing the task under less supervision (Figure 1).

Students understood the rationale for entrustment decisions in the workplace but described a range of factors that influenced this in the hospital setting.

Conclusion: Supervisors often find it difficult to judge trainees in the placement setting (Choo, 2014, ten Cate, 2016). This study showed that students were frequently given higher levels of supervision than they thought necessary for their perceived level of competence. It identifies a range of influencing factors from student and supervisor factors to those related to the environment, workload and curriculum.

Designing tools to support entrustment decisions and associated assessments in the workplace is key to supporting the development of skills in situations where multiple short placements exist. The structured use of Entrustable Professional Activities (EPA) is as a result, now being introduced for 2nd and 3rd year MPharm undergraduate students.

Figure 1: A comparison of the level of supervision students performed tasks under, and the level of supervision they *felt able* to perform the task under (n=53)

Legend:
- Felt the level they performed the task at was too high
- Felt the level they performed the task at was correct
- Felt the level they performed the task at was too low

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INTERPROFESSIONAL EDUCATION – RIGHT APPROACH, WRONG PARTICIPANTS?
THE GATEKEEPER ROLE OF THE GP RECEPTIONIST

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CARDIFF UNIVERSITY

PRIFYSGOL CAERDYDD

Objective

Effective interprofessional teamwork is essential to deliver quality outcomes for patients. However, evidence suggests that interprofessional collaboration in healthcare is suboptimal. Interprofessional education (IPE) has therefore been embedded in Pharmacy undergraduate programmes to promote interprofessional collaboration. This IPE involves students training to become healthcare professionals (HCPs). Whilst the relationship with HCPs is vital, there is evidence that the relationship with support staff is similarly important [1]. In this study, the objective was to understand the relationship between community pharmacists and receptionists in General Practitioner (GP) practices.

Method

Community pharmacists were recruited by purposive, snowball sampling. Semi-structured interviews were conducted to understand pharmacists' relationships with GP receptionists. Interviews were transcribed verbatim and inductive thematic analysis undertaken.

Results

Fifteen community pharmacists were interviewed. Participants reported daily interactions with GP receptionists. Key themes which emerged from the data were:
(i) The receptionist's broker role in enabling pharmacist interactions with the GP *"The receptionists are quite open to getting them (the HCP) to come and talk to you."*

Results contd.

(ii) the receptionist's broker role as a barrier to interactions with the GP *"I feel that sometimes the receptionists are the barrier, they will try to do anything they can to you know, just get rid of you basically."*

(iii) the receptionist being helpful in resolving patient-related issues *"(GPs) don't have time to deal with that and we don't have time to wait for them to call us back so we deal with the receptionists there, they get the issues sorted for us most of the time."*

(iv) the need for a good relationship with the receptionist *"I think the fact that we have built up such a good relationship with the receptionist in there I think that this makes it easier and they sort of believe, they trust what I say."*

Conclusion

GP receptionists are members of the wider multidisciplinary team and play a significant role in 'brokering' interactions between pharmacists and GPs[2]. Participants in this study found interactions with receptionists to often be frustrating, with some citing the receptionist as the main barrier to interactions with GPs. Although there were a variety of reasons for this, participants indicated that receptionists don't understand the pharmacist's role. Given the importance of the GP receptionist in facilitating interactions between pharmacists and GPs, and a lack of shared understanding of roles, it would be beneficial to develop IPE activities that include the GP receptionist in order to foster collaboration.

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Who wants to be a millionaire as a game for Pharmacy curriculum

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Newcastle University

Study objective

In response to Stage 1 undergraduate pharmacy students reporting difficulty with particular topics of biology, we have developed seminar sessions to support students' learning. To assess the optimal teaching strategy, an experimental design was adopted. The hypothesis is that the competitive interactivity of the educational game would improve student knowledge retention.

Design

Half the cohort experienced seminars requiring students to work in groups to answer open questions on the topic [Group2], whilst the other half of the cohort experienced a seminar adopting elements of the game "who wants to be a millionaire" [Group1]. Students played competitively in small teams.

Prior to both sets of seminars, students undertook a pre-test of 12 MCQs to assess their knowledge, and then a post-test to capture knowledge attainment (Figure 1). Results were compared between groups and a t-test used to assess for difference. A feedback form including five 5-point Likert scale questions, was distributed requiring students to rate components of the session, including the level of engagement and team-work.

Figure 1: experimental design

Results

Students attending the game sessions [1] showed a statistically significant ($p=0.03$) improvement between pre-test and post-test scores. Conversely, the difference for students attending [2] was not statistically significant (Figure 2). In the feedback form, students who played the game found the session more engaging and valued team-work as more important to stimulate their learning, compared to students who attended the seminar session (Table 1).

Conclusion

The competitive and engaging nature of the game appears to facilitate knowledge retention. Wider adoption of this strategy may augment student learning further.

Figure 2: Students attending [1] improved in the post-test scores

Table 1: Student feedback (Means_SD of 5 point Likert scale)

Component	Game	Seminar
Engaging	4.5_0.5	4.1_0.7
Stimulating	4.3_0.6	4.1_0.7
Team-working	4.4_0.5	4_0.9
Informative	4.4_0.7	4.3_0.8
Reinforcing	4.3_0.6	4.3_0.8

Key Determinants of Pharmacy Education Fitness for Purpose in a Resource Constrained Country

*Ifunanya Ikhile, *Claire Anderson, **Simon McGrath, *Stephanie Bridges

Introduction

Skill mix imbalance has been described in literature as a major health workforce challenge in **Sub-Saharan Africa** [1]: a region with the highest burden of diseases yet smallest health workforce numbers globally. Ensuring **fit for purpose education** by collaboratively optimising **pharmacy workforce development** to meet societal healthcare needs, can address this challenge, and bridge health inequities towards the achievement of global health goals.

Aim

To identify key determinants for fit for purpose pharmacy education from key stakeholder perspectives in a resource constrained country as a first step towards addressing the skill mix imbalance.

Methods

23 Semi-structured in-depth individual interviews with education leadership

55 Pharmacy education stakeholders interviewed in focus groups

Across all geopolitical zones and several sectors of practice in Nigeria

Stakeholders Interviewed

Students	Patients	Interns	Preceptors
Pharmacy Educators	Universities	Government	Education & Health Ministries
Pharmacists	Pharmacists Council	Regulatory Bodies	Others

Results

Key Determinants

Findings revealed 3 key determinants, **Education Quality**, **Education Relevance** and **Government, Systems and Policy**. Quality was defined by compliance with standards, regulation efficiency, academic capacity, students' learning agility and evidence based pedagogy. Relevance involved education-practice partnerships, local applicability of global initiatives, curricular flexibility and needs-based specialization. Systems and policy indicated socio-economic stability, geopolitical equality and workable policies.

Please scan for full results

Conclusion

Fit for purpose pharmacy education must be of good quality, flexibly relevant to the dynamics of practice, and developed by the government through efficient systems and workable policies.

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PROFESSIONALISM IN THE PRE-REGISTRATION PHARMACIST PLACEMENT: AN EXPLORATORY STAKEHOLDER STUDY

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OBJECTIVE

Interest in professionalism within UK health professionals has increased following reports highlighting poor patient care. This together with new patient-facing roles for pharmacists has questioned of how pharmacists develop professionalism. Pre-registration is a key component on the career pathway to registration as a pharmacist.

This study explored how professionalism is understood, developed and its achievement judged during the pre-registration placement from the perspectives of the General Pharmaceutical Council (GPhC), service users, pre-registration pharmacist trainees and pre-registration tutors. Representation of these four groups within one study is novel and provided a unique insight.

METHODS

An interpretative paradigm approach was adopted, involving a semi-structured group interview, focus groups and qualitative e-questionnaire. An active thematic interpretative analysis approach was used to identify, evaluate and consider patterns across all data sets.

RESULTS

A shared definition of professionalism was elusive and this aspiration was challenged because stakeholders understood professionalism in ways that were dynamic and subjective. Trainees and tutors provided insights into a series of transformative moments that took place during pre-registration to potentiate professionalism development. The first moment being the issuing of the title pre-registration trainee.

> "I have a title, I'm not a student anymore! It is a step up." Trainee 2

All groups reported emotional connections with patients throughout the placement aided professionalism maturation (from self-centred student to becoming an outwardly looking and responsible professional).

> "Trainees need to engage with patients to develop professionalism" GPhC staff member A.

> "Less exposure to patients can decrease the development of professionalism" Tutor 1.

Tutors indicated the rate of professionalism development may be vary across sectors of pharmacy practice, with community pharmacy facilitating faster professionalism maturation due to increased trainee autonomy.

> "In hospital (pharmacy) the trainees are a little more sheltered from taking responsibility so their professionalism can take longer to develop than community (pharmacy)" Tutor 2

Although no tutors reported that patients formally assessed trainees' professionalism, service users expected to be involved.

> "Ask the patient, it's highly obvious, without us you don't have a job" Service user 2

CONCLUSION

This study proposes the existence of transformative moments and maturation periods in pre-registration and suggests both are essential to becoming a pharmacist. The study suggests careful planning of training placements to enable varying rates of professionalism development in different sectors of pharmacy practice to be considered. Formal and consistent involvement of patients in assessments of trainee's achievement of professionalism is recommended.

The use of Situational Judgement Tests for international advanced pharmacy practice experience selection

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Objective

- Situational Judgement Tests (SJTs) are a measurement method designed to assess judgement of a situation, cognitive aptitude, and non-academic skills.
- SJTs have been used in trainee selection for health professions education to assess non-academic attributes such as critical thinking, empathy, and leadership.[1,2]
- There are examples of SJT use in pharmacy school admissions but none regarding their role in student selection for advanced pharmacy practice experiences (APPEs).
- **The objective of this innovation was to develop and vet SJTs within the application process for international APPEs across multiple institutions.**

Design

Authors worked with researchers experienced in SJT development to initially create two SJTs that focused on desirable skills in global health situations including adaptability and initiative. A comprehensive online application that included SJTs was developed for utilization across three institutions. Limited demographic information was also collected for research purposes.

Results

Students (n,%) by WHO income group and University	University of Pittsburgh	Purdue University	University of North Carolina
High Income Country	17 (65%)	11 (29%)	23 (45%
Middle Income Country	9 (33%)	27 (71%)	10 (20%)
Low Income Country	0	0	18 (35%)

Ranked response mode by University and by WHO income group

Scenario 1	A	B	C	D	E
Pitt	4	2	3	1	5
Purdue	4	2	3	1	5
UNC	4	2	3	1	5
HIC	4	2	3	1	5
MIC	4	2	3	1	5
LIC	3	2	5	1	5

Scenario 2	A	B	C	D	E
Pitt	2	1	5	4	3
Purdue	4	1	5	4	2
UNC	3	1	5	4	2
HIC	2	1	5	4	2
MIC	2	1	5	4	2
LIC	3	1	5	4	2

Distribution of student rankings

Scenario 1:

Scenario 2:
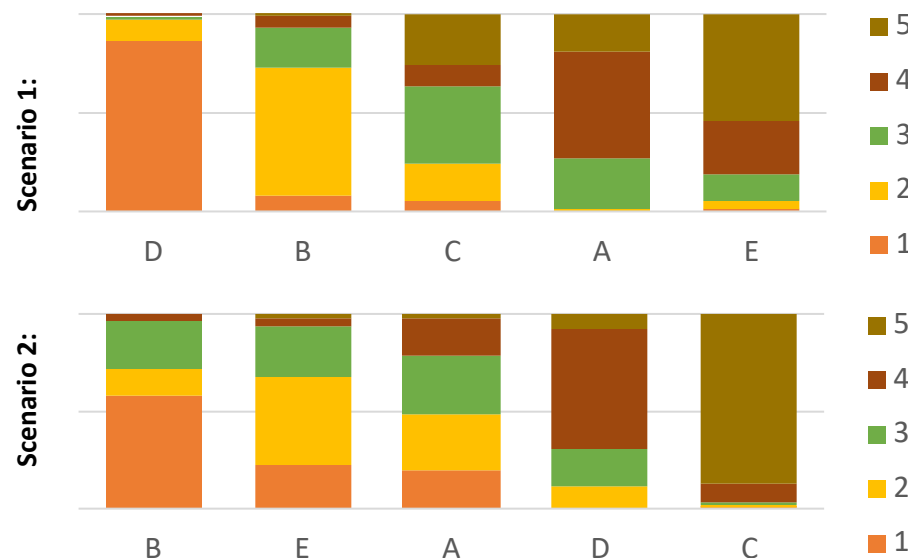
Conclusions

- Responses to the pilot SJTs were consistent across schools and across country income levels.
- Next steps include further validating the developed SJTs and developing additional SJTs for inclusion in future application processes.
- Another step would be to assess changes in responses following participation in global health APPE activities.

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A HOLISTIC AND EVIDENCE-BASED FRAMEWORK TO EVALUATE MULTIPLE CHOICE QUESTION (MCQ)-BASED SUMMATIVE ASSESSMENTS

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OBJECTIVES

WHAT'S KNOWN

MCQ in the VIM

MCQ-based Summative Assessments

Among the most prevalent forms of assessment

in **Pharmacy Education**

(Pate et al, 2014)

30% of Summative Assessments

33 MCQ-based summative assessments (in Twelve 1st & 2nd Year Units)

>500 MCQ test items across 12 units in Year 1 & Year 2

QUALITY

reliability, validity & feasibility

Assessment Utility

cost effectiveness, acceptance & educational impact

van der Vleuten (1996)

| Validity evidence based on test content | Validity evidence based on response process | Validity evidence based on internal test structure | Validity evidence based on relations to other variables |

Kibble (2017)   American Educational Research Association (1999); Cizek et al (2010)

WHAT NEEDS TO BE ADDRESSED?

1. The need for quality assurance in the new Pharmacy Program
2. The need for more research using a holistic examination of MCQ-based summative assessments in Pharmacy Education
3. The need for contextualised and evidence-based resources for Pharmacy educators to develop quality MCQ-based summative assessments

RESEARCH QUESTIONS

? What is the quality of MCQ summative assessments in the first two years of the newly developed Pharmacy course?

? What are the key characteristics of quality MCQ-based summative assessments identified from the evaluation?

? What are the processes and strategies utilised to develop quality MCQ-based summative assessments?

? What are the tools / resources developed from this research that can be used to design quality MCQ-based summative assessments in the current context of the Pharmacy program and related Pharmacy educational settings?

PRELIMINARY RESULTS

Level	Criteria	Evidence	Method-ology	Interpretation & Action Plan
Item	Quality of questions	Difficulty factor	Item Analysis	1) items with a negative DI? 2) Deceptively easy item? 3) Correct answer key used? 4) Items that do not discriminate between the students, namely, where the DI is 0.0 or very close to 0.0? 5) Items which are either very hard or very easy and therefore where you could expect a DI of 0?
		Discrimination index		
Whole test	Test Reliability	Test-Retest reliability	Determination of correlation and reliability coefficient	Influencing factors: (1) Number of items; (2) the wider the coverage of contents(sampling of important areas of the unit); (3) environmental errors during the exams; (4) processing errors
		Internal Consistency		
Cross-unit assessments	Test Validity	Content-related evidence	Table of specification	
		Construct-related evidence	Content Analysis	
		Criterion-related evidence	Cross-Assessments comparison	
Cross-program assessments		Educational impacts	Content analysis (Cognitive level)	
		Usability	Process analysis	

CONCLUSIONS

➢ Evaluating MCQ tests should involve multiple levels of evaluation, extending to the unit and program levels. While the quality of test items and the test itself is critical, **it is equally important** to examine the **alignment** of the test with the unit learning outcomes, its interconnection with other assessments in the unit and program. Alignment is the key.

➢ Evaluation should be based on multiple sources of evidence and the use of both quantitative and qualitative methodology

This framework would inform the quality assurance, quality improvement processes, as well as designing professional development for academic staff in terms of assessment development and evaluation in our Pharmacy program and similar educational contexts.

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8 WORKING WITH OTHERS | 6 LEADERSHIP DEVELOPMENT | 1 ACADEMIC CAPACITY | 2 FOUNDATION TRAINING

A study to Investigate undergraduate pharmacy students' experience of an integrated curriculum.

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Study Objective

Curriculum integration in pharmacy undergraduate programmes has widely been adopted in the United Kingdom and internationally. The operational and delivery strategies across and within these programmes vary across the continuum of Harden's ladder of integration. This study aims to investigate the undergraduate student experience of an integrated Master of Pharmacy (MPharm) programme at one School of Pharmacy in England.

Study Design

Undergraduate students in stages 1-3 were invited to participate in a series of focus groups (one per stage) to investigate the experience of teaching and learning within this programme. Subsequent semi-structured interviews were undertaken with students across these cohorts to explore the themes derived from the focus groups (figure 1). Focus group discussions and interviews were audio-recorded with written consent, transcribed verbatim and thematically analysed.

Study Results and Conclusion

Four themes were identified from the thematic analysis. The four themes were: teaching in an integrated curriculum, adjusting to an integrated curriculum, defining curriculum integration, and preparing for the role of a pharmacist. Overall students enjoyed integrated teaching, describing it as allowing them to have crucial problem-solving skills and competencies required for the role of a pharmacist. An integrated MPharm curriculum facilities a student's appreciation and understanding of the individual disciplines relating to pharmacy and, allows students to feel adequately prepared for their future career as a pharmacist.

```
Participate Recruitment
        │
        ▼
20 MPharm Students in Stages 1-3 Agreed to
Participate.
        │
        ▼
Data Collection
    │           │
    ▼           ▼
2 Focus     9 Semi-Structured
Groups  →   Interviews
    │           │
    ▼           ▼
Focus groups and interviews were audio transcribed
and in verbatim and thematically analysed.
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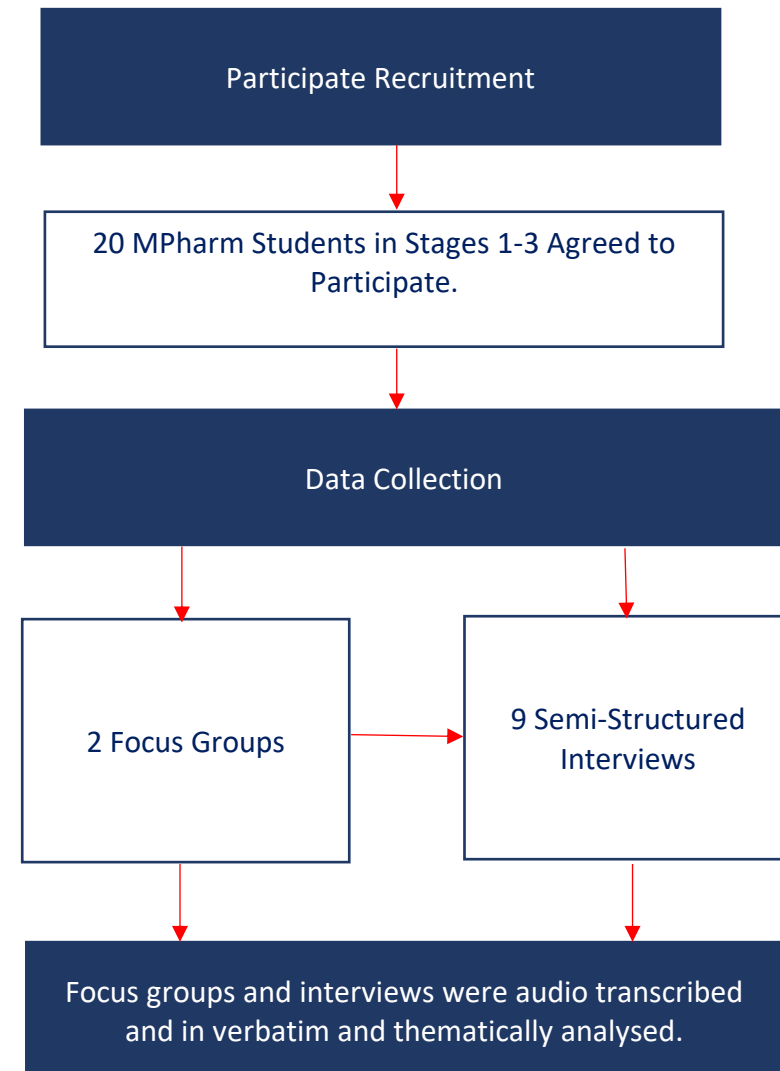
Figure 1: Study Design

Development and Evaluation of a Situational Judgement Scenarios (SJS) Tool for the Faculty of Pharmacy & Pharmaceutical Sciences at Monash University

Fiona Patterson[1], Kirsten Galbraith[2], Charlotte Flaxman[1], Carl Kirkpatrick[2]

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[2] Monash University, Parkville, Australia

OBJECTIVES

Following the success of a pilot SJS in 2016, Monash University's Faculty of Pharmacy and Pharmaceutical Sciences have implemented an SJS in 2017 and 2018.

- *Providing students with feedback on their performance on the SJS, informing their personalised learning plan.*

- *Providing an appropriate metric to monitor and evaluate the level of progression of the non-academic attributes of pharmacy students.*

DESIGN AND METHODOLOGY

Develop test specification	Informed by the outcomes of a role analysis
Develop SJT scenarios and response options	Written and reviewed using knowledge from appropriate subject matter experts (SMEs)
Establish scoring key	Seeking input from different groups of SMEs
Test construction	In line with test specification
Pilot the test	To measure fairness, psychometric properties and candidate reactions
Psychometric analysis	To analyse psychometric properties and performance of SJT items
Maintain SJT items in an item bank	Securely storing SJT information for ongoing development

RESULTS

- Across 2017 and 2018, students from across the four cohorts completed the SJS. The tool demonstrated **excellent levels of internal reliability**, with a close to normal distribution of total scores.

- The results indicate the **SJS can differentiate between students**, thus providing a sufficient spread of scores to support identification of students that may benefit from additional support.

- Results showed a **significant difference in SJS scores across year levels**, indicating that students further through their training are more likely to achieve a higher score.

- Native language explained some variation in students' SJS scores, however the **campus** a student was studying at appeared to **contribute the most to the variation in SJS score**.

Reporting Year	N	Reliability	Mean	SEM	Max poss.	Mean %	SD	Min	Max	No. items
2016-17	678	.91	601.03	12.74	744	80.8	43.06	410	690	201
2017-18	1181	.88	303.03	9.92	395	76.72	28.64	153	369	108
2018-19	1286	.76	329.74	9.71	419	78.70	19.82	229	374	114

Figure 1. Descriptive statistics from the first three cycles of the SJS.
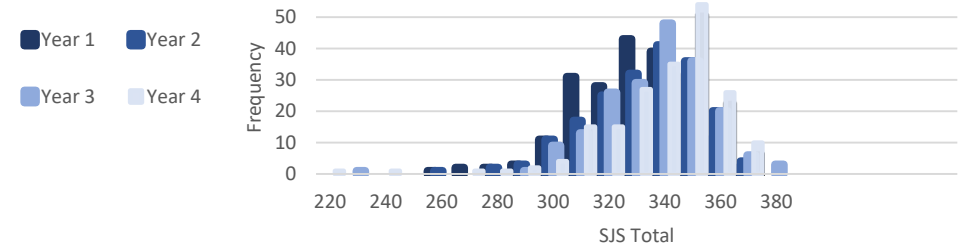
Figure 2. Histogram to demonstrate distribution of total SJS scores split by year group in 2018.

Demographic Group	N	Mean	SD	T-test Sig.	Effect Size
Australia	747	334.29	18.35	p < .01	d = 0.68
Malaysia	413	321.63	18.75		
First language	468	335.55	18.29	p < 0.01	d = 0.51
Second language	655	325.98	19.23		

Figure 3. Demographics and differences in SJT score based on demographic group in 2018.

CONCLUSIONS

- THE SJS developed, validated and implemented with a cohort of undergraduate pharmacy students.
- It was able to differentiate students requiring additional support with skill development.
- Individual feedback to students on specific skills encouraged reflection and development of a personalised learning plan.

ESTABLISHMENT OF A WORKPLACE-BASED EXPERIENTIAL CLINICAL PHARMACY TRAINING PROGRAM IN AUSTRALIA FOR CHINESE PHARMACISTS

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Introduction

China's Ministry of Health has implemented healthcare reforms mandating clinical pharmacy services be integrated into hospitals. This has resulted in increased demand for Chinese pharmacists with knowledge and skills to deliver clinical pharmacy services at a patient facing and operational level.

Objective

To establish a clinical pharmacy training program for Chinese pharmacists at Monash Health, a tertiary referral metropolitan teaching hospital in Melbourne, Australia, in collaboration with the Chinese Pharmaceutical Association.

Program Design

Participants

Three Chinese registered pharmacists working in hospital practice in China completed the 24 week structured clinical pharmacy training program (Figure 1) in 2017-2018.

Activities and assessments

- Program handbook and pre-reading provided prior to program commencement
- shpaclinCAT self-assessment at weeks 4 and 12 and supervisor-assessment at week 12
- Education tools for ongoing assessment and feedback including checklists, rubrics, mini-Clinical Examination (Mini-CEX) and case-based discussion tools.

Program evaluation

- Anonymous surveys about experiences with the training program at weeks 4, 12 and 24
- Learner to supervising pharmacist clinical teaching questionnaires.

The program aligned with International Pharmaceutical Federation Workforce Development Goal 7 - Service provision and workforce education and training.

One week
- Department orientation

Two weeks
- Intensive clinical pharmacy orientation and skill training and assessment on the wards

20 weeks
- Various ward and clinic based clinical rotations supervised by clinical pharmacists
- Knowledge and skills acquisition and consolidation
- Training with advancing practice pharmacists in generalist and focussed roles and innovative services

One week
- Quality Use of Medicines/Governance
- Medicines Use Evaluation audit

Figure 1: Training program structure

- Introduction of Antimicrobial Stewardship programs and 'traffic light' system
- Involvement in reviewing the content and structure for China's licensed pharmacist examination
- Knowledge and experience gained from the training program shared with colleagues
- Development and implementation of clinical pharmacy procedures/policies to guide daily practice
- One participant was inspired to change their focus of practice to oncology

Figure 2: Examples of program outcomes implemented in China

Results

The clinical pharmacy training program resulted in positive outcomes for both participants and supervisors, with participants applying learning at their workplaces in China (Figure 2). Improvements have been made for future program delivery.

Conclusion

Workplace-based experiential training in Australia exposed Chinese pharmacists to established and well-developed clinical pharmacy and clinical education services. After completion of the training program, Chinese pharmacists have generalised and applied learning to the hospital pharmacy setting in China.

NELSON MANDELA
UNIVERSITY

THINKING WHILE DOING - SIMULATION-BASED DISPENSING PRACTICE INTEGRATING COMPLEX COGNITIVE SKILLS

Authors: Monique Klitsie and Sue Burton

STUDY OBJECTIVES:

This study explored the ways in which a simulation-based dispensing programme, MyDispense, can facilitate the integration of clinical knowledge-based cognitive skills into the dispensing process.

STUDY DESIGN:

Simulated patient scenarios for MyDispense were designed and developed, specifically to integrate a hierarchy of cognitive skills into the dispensing process. The scenarios were assessed by pharmacy educators to determine the level of cognitive skills required for their successful completion. The scenarios were piloted by a group of 3rd year pharmacy students. A focus group was used to explore the students' experience of using MyDispense to integrate their clinical knowledge into the dispensing process.

STUDY RESULTS:

The scenarios assessed by the pharmacy lecturers were proven to require high levels of cognitive skills as described by Bloom's revised taxonomy (Anderson & Krathwohl, 2001) and necessitated students to plan, construct, design and generate information to complete the scenarios.
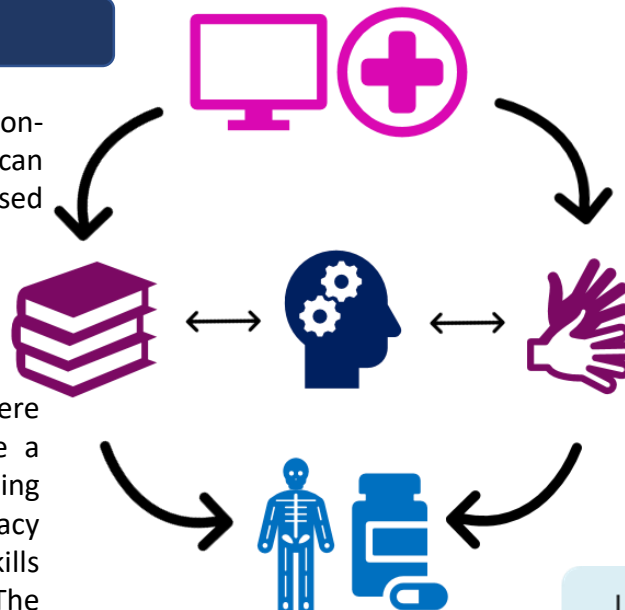
Figure 1: Summary of the Students' Experience of MyDispense

The pharmacy students successfully practiced the MyDispense scenarios as an adjunct to a clinical module and reported that the scenarios assisted in learning for the clinical module. The students acknowledged that they were required to apply their clinical knowledge together with their technical skills to make clinical decisions, while completing the scenarios (see Fig 1). Students also reported that they found the integration of clinical skills promoted by MyDispense relevant to and useful for general professional practice.

STUDY CONCLUSIONS:

This study demonstrates that simulation-based education can be used as a beneficial educational tool for teaching the application of complex clinical knowledge-based cognitive skills during the dispensing process. It provides a valuable means of preparing students for professional work-based pharmacy practice.

Anderson, L., & Krathwohl, D. R. (2001). A Taxonomy for Learning, Teaching, and Assessing: A Revision of Bloom's Taxonomy of Educational Objectives. Boston, MA: Allyn & Bacon.

Lower Cognitive Level	Higher Cognitive Level
Phase 1 — Receipt of the prescription, confirming integrity of communication and ensuring optimal use of medicine	
Phase 2 — Preparation, labelling and recording keeping of the prescribed medicine	
Phase 3 — Provision of information and instructions to the patient	

Dispensing Process
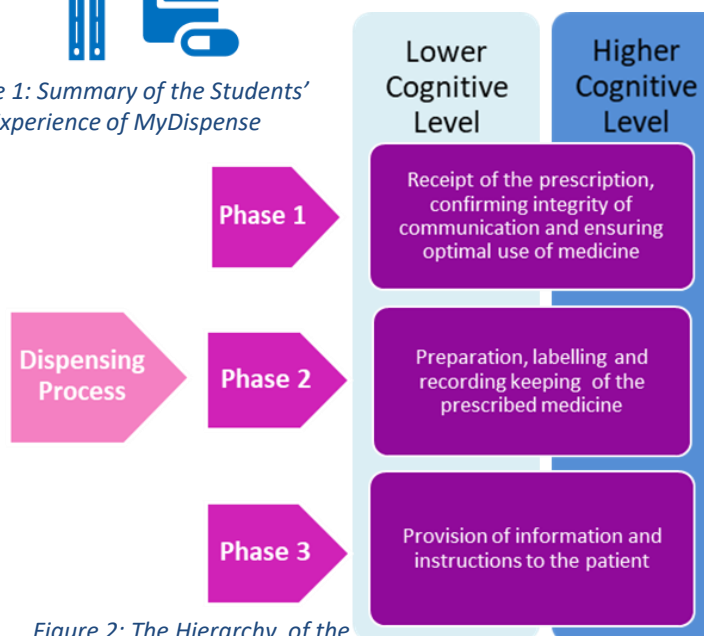
Figure 2: The Hierarchy of the Dispensing Process Categorised into Lower and Higher Cognitive Levels

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Change the World

Can implementing a feedback framework lead to improved written reflections by pharmacy interns?

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[1]Monash University, Faculty of Pharmacy and Pharmaceutical Sciences; [2]University of California, San Francisco

Background

The Pharmacy Board of Australia:
- Requires pharmacists and pharmacy interns to complete continuing professional development (CPD) to maintain competence in practice
- States that activities involving self-reflection can be included as CPD for pharmacy interns

The Monash pharmacy intern training program (ITP) requires interns to complete reflections on each CPD activity.

Objective

To evaluate the feasibility and effectiveness of tutors providing targeted formative feedback using a structured framework for CPD reflections written by pharmacy interns.

Method

- Pilot study
- Convenience sample and all samples randomised
- **Inclusion criteria**
  - Monash ITP intern commencing in semester 1, 2018
  - Learning portfolio tutors with ≥1 year tutor experience
- **Exclusion criteria**
  - Monash ITP mid-year intake interns
  - Learning portfolio tutors with <1 year tutor experience
  - Learning portfolio tutors who served as skills coaches in the undergraduate program

Results
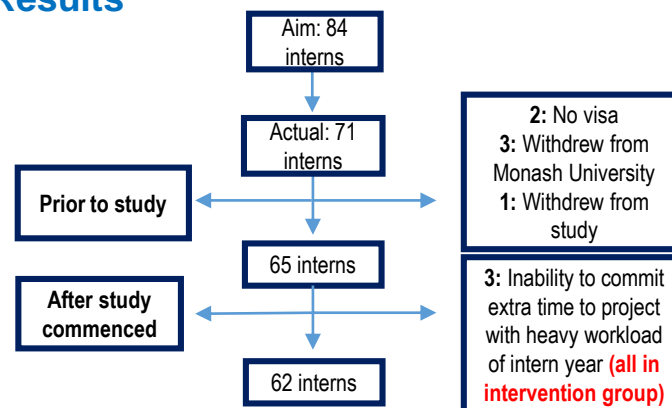
Feasibility for tutors

	Outcome Value Across All Measurements mean (SD, n)			Outcome by Sequence Slope of Time Spent vs Reflection Number		
	Comp Group	I Group	p-value	Comp Group vs no change	I Group vs no change	p-value for differences in slopes
Time spent on reflection (minutes)	7.46 (2.68, 193)	11.1 (4.7, 98)	<0.001	-0.03 (p=0.86)	-0.65 (p<0.001)	P=0.001

- Tutors in intervention group took significantly longer giving feedback.
- Time taken to provide feedback for the intervention group reduced significantly over time.
- All tutors agreed that the time it took them to provide feedback was reasonable.

Impact on reflective abilities of pharmacy interns

As more reflections were written, intervention group interns significantly improved in their reflective abilities compared to those in the control (P=0.04) and comparator groups (P=0.001).

Experiences and perceptions, interns

83% Agreed or strongly agreed — 'Feedback was organised in a way that helped me take action.'

87% Agreed or strongly agreed — 'Feedback assisted me to think more deeply about areas I need to develop.'

85% Agreed or strongly agreed — 'Feedback allowed me to become more aware of my growth and development as a pharmacist.'

85% Agreed or strongly agreed — 'The way feedback was organised helped me set clear goals to address my knowledge gaps.'

Conclusion

Feasibility: Intervention group tutors became more efficient at providing feedback over time.
Structured feedback: Led to significantly improved pharmacy intern CPD reflections over time.
Perceptions: Of both tutors and pharmacy interns were positive overall, indicating that implementation of structured feedback would be feasible.

MONASH University

IMPLEMENTATION OF GLOBAL PATHWAYS: LONG DURATION INTERNATIONAL PHARMACY EXPERIENTIAL PLACEMENTS

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[1] University of Technology Sydney, Australia; [2] University of Nottingham, UK; [3] Bayer AG, Berlin, Germany; [4] University of Toronto, Canada

Objective: To initiate, implement and sustain a 12-month international experiential placement to enhance students' leadership, collaborative skills, business acumen, development of cultural diversity and expand on their current pharmacy practice in university or pharmaceutical industry settings.

Method: Each Global pathway is dependent on the processes and regulations of the host country. Considerations of Northern Hemisphere university commencement dates, international and legal processes; seeking appropriate supervisors and adhering to visa requirements are essential for effective implementation. Furthermore, regular skype/zoom meetings with the host preceptors, students and the home preceptor were conducted. Contracts between the university-university or university-industry were issued, outlining the responsibilities of the host and home university preceptors.

Results: Three varied pathways to enhance students' global experience and leadership on placement were successfully implemented:

1. University-University (University of Technology Sydney, UTS) with University of Toronto (UoT) via a **Study Abroad Scheme**

2. University-University (University of Technology Sydney, UTS) with the University of Nottingham via a **Student Exchange Scheme**

3. University- Pharmaceutical Industry (University of Technology Sydney, UTS) with Bayer DE Berlin, Germany via **Individual Contract**

Conclusion: These long duration international placements are the first worldwide for pharmacy education. In addition to contributing to future research and collaboration with new key partners, the 12-month placement allowed students to develop their research, health literacy and business skills on their own research or industry project in a different cultural environment. Building rapport with preceptors, the host international teams and having open communication with students prior, during and after their return are essential for initiating and sustaining global experiential placements.

Acknowledgements: Extend to the UTS International; UTS Student Exchange team members: Mychel Palamountain (Associate Director UTS International), Catherine Boisclair-Proulx (International Relations Officer, UTS); Simon Watson (Student Exchange, UTS) and Heads of Schools and Bayer AG for their support in this initiative.
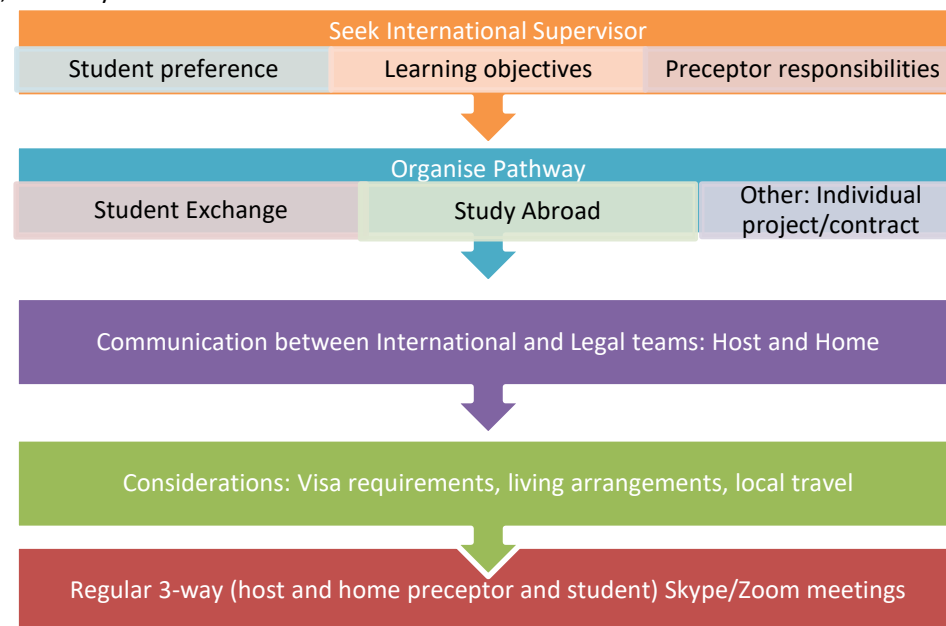
Figure 1. Processes for consideration for effective implementation of long duration international experiential placements

ARE WE GETTING THE BIG PICTURE? PHARMACISTS' UNDERSTANDING OF RISK FACTORS AND ABSOLUTE RISK IN SCREENING AND MONITORING

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Objective

To identify pharmacists' educational needs for monitoring people's risk factors and absolute cardiovascular disease (CVD) risk.

Method

Three vignette case studies asking pharmacists to describe advice to people without known CVD and their clinical reasoning were designed. Vignettes described people presenting for total cholesterol (TC) and blood pressure testing at a pharmacy and were sent to the work email address of 329 practicing community pharmacists. Cases provided necessary information for absolute CVD risk assessment.
Open-ended responses in the advice and reasoning sections were analysed using content analysis. The coding framework assessed the appropriateness of advice and underlying reasoning in decision making.

Rationale in each vignette	
Vignette 1	Screening a client with recommended TC level and a moderate (13%) CVD* risk estimate (smoker).
Vignette 2	Screening a client with elevated TC level and a low (4%) CVD* risk estimate.
Vignette 3	Monitoring a patient with known and treated CV risk factors and insignificant increase in TC levels.

Table 1: Vignettes' rationale
Absolute CVD risk was not presented with vignette

Results

Twenty-nine pharmacists returned complete responses to all vignettes. Pharmacists provided appropriate advice in regards to lifestyle measures. Pharmacists seemed to focus on isolated risk factors, e.g. TC or smoking, instead of assessing overall CVD risk in the context of the case person's age, gender and smoking status. None explicitly based their recommendations on application of a risk calculator. Their reasoning showed an anchoring on isolated risk factors, particularly TC levels, which resulted in inappropriate recommendations of referral and pharmacotherapy when correlated to actual absolute CVD risk.
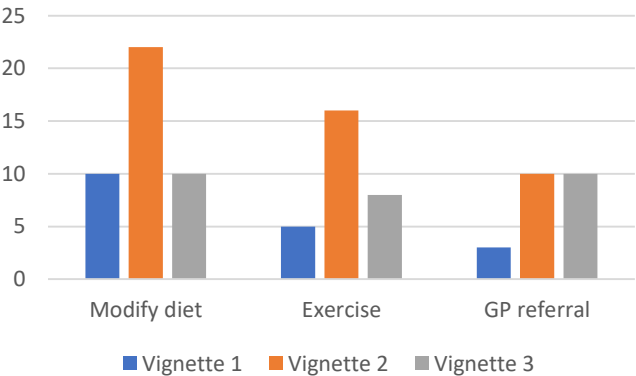
Graph 1: Advice recommendations
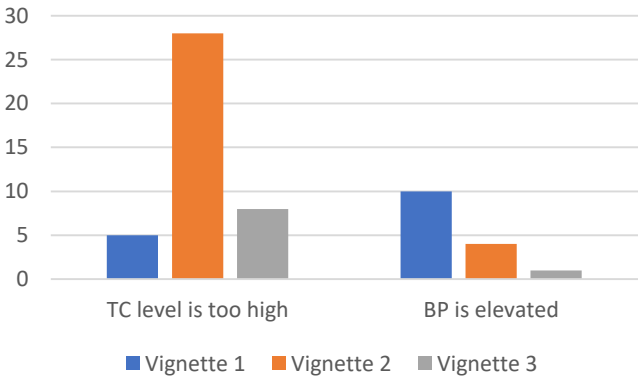
Graph 2: Reasons of Advice

Conclusion

When screening and monitoring people with risk factors for cardiovascular or metabolic illnesses future and practicing pharmacists may benefit from educational strategies which support their decision making skills in overall risk assessment.

A structured approach to the use of videos and reflective practice in preparing for OSCEs

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MONASH University

OBJECTIVE

To explore the influence of structured Objective Structured Clinical Examination (OSCE) preparation activities that involved video reflective practice in preparing First Year Pharmacy students for OSCEs.

DESIGN

First Year Pharmacy students participated in structured OSCE preparation activities.

VIDEO RECORDING
Students made a video recording responding to a simple primary care problem

REFLECT
Reflected on video & how prepared they felt for the OSCEs pre-workshop

2 HOUR WORKSHOP
Watched peers' videos & provided individualised peer feedback in small group setting

REFLECT
Evaluated how helpful the workshop was & how prepared they felt for the OSCEs. They also reflected on their OSCE performance

To investigate the influence of these activities in preparing students for OSCEs, a **mixed methods design** was employed. Data obtained from 192 students from 1st year pharmacy in 2017 were analysed.

The **quantitative component** included multiple regression analysis of the data from:
1. pre and post-workshop surveys of the student participants
2. learning analytics in terms of student attendance and completion data of activities and OSCE marks.

The **qualitative component involved** a thematic analysis of students' reflections of their self-recorded video and their OSCE video was conducted using NVivo, v11 (QSR International)

CONCLUSION

The use of video-based reflective practice correlated positively with student OSCE performance. Video-based reflective practice helped enhance students' awareness of their learning and stimulated them to consider various learning strategies according to their own learning needs for OSCEs.

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1. Austin, Z., O'Byrne, C., Pugsley, J. and Munoz, L. (2003). Development and Validation Processes for an Objective Structured Clinical Examination (OSCE) for Entry-to-Practice Certification in Pharmacy: The Canadian Experience. *American Journal of Pharmaceutical Education*, 67(3), p.76.

2. Baecher, L., Kung, S.C., Jewkes, A.M. and Rosalia, C. (2013). The role of video for self-evaluation in early field experiences. Teaching and Teacher Education, 36, pp.189-197.

Contact details:

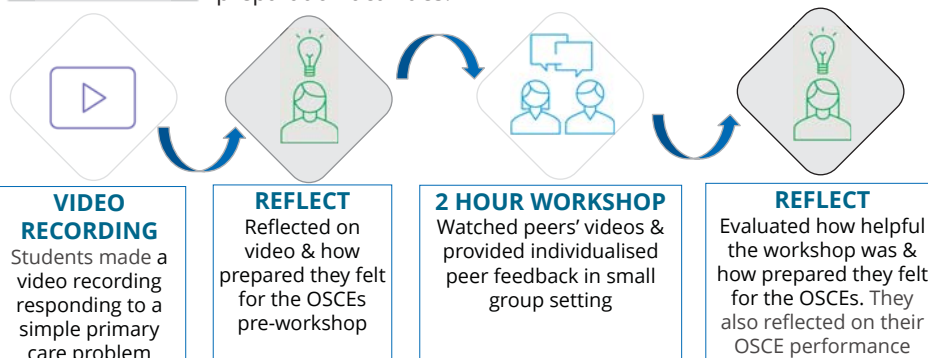For further details, contact:

Dr Vivienne Mak - Vivienne.Mak@monash.edu

RESULTS

A greater proportion of students reported feeling confident for the OSCEs after the workshop, compared to before the workshop (Table 1).

Table 1. Pre and post workshop survey results

	Item	Disagree	Neutral	Agree
Pre-workshop	I currently feel prepared for the OSCEs	36%	51%	13%
Post-workshop	Watching student OSCE video examples helped me prepare for the OSCE	5%	9%	86%
	Filming, watching and reflecting on my role play video allowed me to learn and improve on my skills for the OSCE	4%	4%	92%
	Reviewing and providing feedback on my peer's role play videos allowed me to learn and improve on my skills for the OSCE	9%	4%	87%
	After the workshop, I feel prepared for the OSCEs	7%	39%	54%

A multiple linear regression found a significant correlation between the video and reflection submission and overall OSCE mark, OSCE communication mark and OSCE analytical checklist mark (Table 2), indicating that students that created a video and submitted a reflection performed better in OSCEs than students that did not.

Table 2. Multiple regression of OSCE workshop activities (independent variables) and OSCE performance (dependent variables)

	Overall OSCE mark		OSCE communication mark		OSCE analytical checklist mark	
	Std. B	P	Std. B	P	Std. B	P
Video and reflection submission	.272	**.001**	.265	**.002**	.209	**.014**
Workshop attendance	.091	.272	.059	.482	.133	.116

The thematic analysis of students' reflections identified two main themes:

Theme One

Video-based reflective practice enabled students **to identify gaps in their own learning**

Looking back at the video recording of the test is useful for me to see what I did well and what mistakes I made. I was able to ask all the required questions to decide which medication to give and I counselled the patients about side effects and instructions on how to use the medication. On the other hand, I can see that I did not speak clearly sometimes and use some jargons which made the patient a bit confusing. (Student's reflection)

"It is always a learning process for me as a pharmacist-in-training. Besides having a good knowledge about medication, I cannot doubt the importance of communication skills in the interaction with the patients. I will practice role playing with my friends every Saturday such that each of us take turn to play the role of the pharmacist. The case scenario will be based on the topic I learn in that week. Also, I am currently working in a community pharmacy which I believed, can gain more hands-on experience as I get to interact with the patients and will encounter different scenarios." (Student's reflection)

Theme Two

Reflective practice enabled students **to initiate a variety of learning strategies** to direct their future learning towards the learning goal.

Development of a cultural communication online module for pharmacy students' learning and assessment of cross-cultural skills

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[1] Monash University, Australia; [2] University of North Carolina, USA; [3] University College London, UK

OBJECTIVE

To develop and evaluate an online cultural competence training module for use by pharmacy students across three countries.

DESIGN

An online module, **"Cultural Communication in Pharmacy Settings"** was developed collaboratively by the members of the research team. A series of role play videos **(n=18)** demonstrating interactions with diverse cultural groups were created. The cultural groups represented include, but are not limited to, the Indigenous community, LGBTQI community, ethnic background (i.e. language, religion, customs, etc.), gender, and disability (Figure 1). Students complete self-reflection questions following each role play video. They then receive **Feedback or Key Points** to consider for the particular topic. At the completion of the training module, students were invited to complete a survey.

Figure 1. Snapshot of Cultural Communication in Pharmacy Settings Online Module

RESULTS

The module was piloted at Monash University. UCL & UNC are in the midst of implementation (Table 1).

Table 1. Implementation across 3 institutions

Institution	Implementation	Access Rate	Full Module Completion	Partial Module Completion
Monash University (n=213)	Y1 students (April 2019)	90% (n=191)	46% (n=88)	54% (n=103)
University College London	Y1 students (March 2019)	Ongoing	Ongoing	Ongoing
University North Carolina	Y2 students (Oct 2019)	Pending	Pending	Pending

Example *reflections after watching the videos*

"As the patient, I would feel disrespected because the pharmacist seems to think that I cannot administer the medication by myself because of my disability. She (the pharmacist) also does not address me directly."

"As the (transgender) patient, I would feel accepted and comfortable knowing that the pharmacist has taken steps to know what pronoun I would like to be referred to"

"The pharmacist should have acknowledged that the man (with disability) was able and willing to take part in the discussion.."

"Pharmacists need to be aware of certain communication barriers, for example, English might not be a patient's first language and so this presents a barrier for effective communication between the pharmacist and patient"

The majority of students found the online module useful in reflecting on their own cultural awareness and learning about the importance of cultural communication. Although useful, some students found the module to be lengthy.

"The module was effective at presenting information, however, there was just too much information and it took very long to complete."

"This module is very good for beginner pharmacists who don't know how to communicate with varieties of people."

"These modules were brilliant and provided a thorough learning process. I loved watching the videos and gaining the insight to a real life pharmacy situation whilst learning."

CONCLUSION

There is a growing need for appropriate training models to enhance cross-cultural skills and cultural awareness in health professional schools such as pharmacy[1,2]. The training module will serve as an additional teaching tool to improve cultural communication skills in future Objective Structured Clinical Examinations (OSCEs) and clinical practice. Evaluation of the online module will provide insights into the current level of students' cross-cultural skills, guiding and informing educators on ways to better teach cultural communication and informing the creation of OSCE stations to asses cultural competence in a robust, meaningful and objective way.

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Assessing reflective writing using a rubric: an international follow-up reliability study

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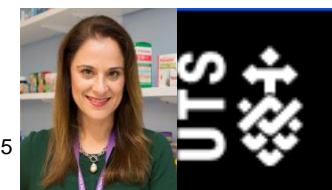
[1]Cardiff School of Pharmacy & Pharmaceutical Sciences, Cardiff University, Cardiff, UK [2]The University of Sydney, Faculty of Medicine and Health, Sydney, Australia [3]Long Island University, College of Pharmacy, New York, USA [4]University of Technology Sydney, Graduate School of Health (Clinical Psychology), Sydney, Australia [5]University of Technology Sydney, Graduate School of Health (Pharmacy), Sydney, Australia

Background

- Pharmacy education internationally has integrated reflection on experiential placements as a strategy to support students to develop their reflective capacity. Reflecting on practice experiences with a critical mindset leads to identifying skills and attitudes that can be improved with the goal to enhance future practice. We have previously designed and tested the reliability of a reflective rubric to assess students' reflective ability, using four assessors from different disciplines in one national institution.[1]

- **Aim:** To further test the reliability of the rubric[1], taking into account a range of academic backgrounds and differences in educational contexts around the globe.

Method

A combination of convenience and randomized sampling was used to select forty-three reflective accounts from a cohort of 105 second year pharmacy undergraduate students, after attending experiential placements. Four assessors derived from Australia, USA and the UK used a reflective rubric to score reflective accounts for students' reflective capacity as demonstrated in the student writing. The interrater reliability (IRR) for each of the seven stages in the rubric and overall was measured utilizing the intra-class correlation coefficient (ICC), using a two-way random effects model with absolute agreement, to determine the level of agreement between the assessors' absolute scores. The closer the ICC is to 1.0, the higher the reliability of agreement and lower the error variance.

Results

Even though variations were observed in the scoring of the individual stages of the rubric by assessors, an 'almost perfect' agreement was calculated for the overall score of the reflective account (ICC= 0.96, $p<0.001$) (Table 1).

Table 1: Intra-class correlation coefficients (ICC) for four raters in a two-way random-effects model with absolute agreement (n = 43 reflective statements).

Rating type*	Average measure ICC	Interpretation of ICC	95% CI lower bound	95% CI upper bound
Combined overall score	0.96	Almost perfect	0.85	0.94
Stage 1	0.69	Substantial	0.50	0.82
Stage 2	0.60	Moderate	0.35	0.76
Stage 3	0.55	Moderate	0.29	0.73
Stage 4	0.69	Substantial	0.50	0.82
Stage 5	0.65	Substantial	0.45	0.79
Stage 6	0.60	Moderate	0.36	0.76
Stage 7	0.58	Moderate	0.35	0.75

*Stage (S)1: Returning to experience; S2: Attending to feelings; S3: Association; S4: Integration; S5: Validation; S6: Appropriation; S7: Outcomes of reflection [2]

Conclusion

This is a follow-up study expanding the pool of assessors to include multiple cultural sensitivities and differences in curricula of educators across three continents. We propose that the rubric in our study can be used as a reliable tool to assess student reflective writing.

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Development of a professionalism self-assessment tool for pharmacy undergraduate students

Kirstie Hill, Rhian Deslandes, Efi Mantzourani

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Background

- Professionalism is a multi-faceted, complex concept for pharmacy professionals, integrating a set of behaviours and attitudes that manifest throughout all aspects of an individual's interactions with peers, patients and the public.

- Pharmacy undergraduate curricula have embedded professionalism throughout, but it is challenging to map students' understanding of professionalism at the early days of their degree, in particular prior to any exposure to experiential placements.

- **Aim:** To develop and pilot a self-assessment tool for pharmacy students to reflect on their understanding of concepts relating to professionalism, in preparation for their first experiential learning.

Method

- This project materialised through co-production with students. A literature review of materials utilised by pharmacy professionals was carried out, and an existing tool was identified as a starting point.

- The tool was adapted to include examples that the researcher felt early year pharmacy students could relate to, whilst retaining the focus on behaviours that demonstrated professionalism, e.g.

"While on placement in a local pharmacy you find out something about a fellow student's medical history and share this with a friend over drinks the same night. Which of the GPhC standards have you BREACHED in revealing this information?"

- Two cycles of piloting and evaluation were carried out with second year pharmacy students (Figure 1). Participants commented on the clarity of questions, time required to complete the test, and other issues identified.

Results

Cycle 1
A ten-question, multiple-choice quiz, tested with six students. Marks ranged from 6/10 to 9/10, with a mean mark of 8. All students agreed that most questions were fair and at an appropriate level; where a wrong answer was provided, it was attributed to lack of familiarity with the content. Only one question was answered incorrectly due to different interpretations of the available options and ambiguity of the question (n=3)

Cycle 2
Changes were made to both the question and options to clarify the intended meaning. Some other questions were also reworded to improve clarity, even though the wording did not affect participants' ability to answer them. The amended version was tested with ten students in cycle 2. Marks ranged from 7/10 to 10/10, with a mean mark of 8.5. There were no comments on ambiguity of questions.

Figure 1: Results from the two cycles of piloting and evaluating of a self-assessment tool for pharmacy undergraduate students early on in their studies.

Conclusion

A student-tailored tool was produced that can be used by pharmacy undergraduate students to self-assess their understanding of professionalism.

References

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Supporting pharmacy students to reflect on teamwork using Lego® creative play

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Method: A building challenge was given to first year pharmacy undergraduate students: naturally occurring teams were asked to build a robot using only two colours of Lego® bricks, within a certain time.[1] A bag with mixed coloured bricks was provided to each team, and teams were asked to negotiate obtaining desirable colour bricks with each other. Final creations were judged by the class, and the team with the best robot, built within the restrictions, won a prize. Students noted barriers and facilitators to the process, such as time restraints and limited resources, which were then contextualised with daily practice of healthcare professionals. After the workshop they were asked to complete a survey evaluating the teaching activity. Quantitative data was analysed with descriptive statistics and deductive thematic analysis of free-text comments identified factors related to teamwork.

Aim: To implement and evaluate a Lego® creative play building challenge aiming to support students to reflect on teamwork.

Results: A 46% response rate was achieved (n=47/102). Forty-five students agreed that the activity was beneficial in order to understand differences in ways their peers work in a team. Students identified a range of behaviours or issues that are representative of real-life scenarios.[2] Decision-making was the biggest factor contributing to student performance: speed of decisions was mentioned as a challenge, whereas aligning tailored actions to the goal was noted as helpful. Roles within a team was another prominent factor: students appreciated peers coordinating the team's actions, volunteering for tasks they felt competent for, and keeping calm under pressure, whereas they were frustrated with peers trying to force their own opinion or losing interest and not contributing to the team.
Example characteristics observed that students noted they will not take forward in their student and/or professional life include:

"Failure to voice out potential and great opinions or ideas due to shyness and self-consciousness"

"Bad planning and scattered opinions without a final conclusion on how to execute the activities"

"Being reclusive and dismissive towards other members of the same groups and other groups"

Conclusion: The activity was successful in supporting students to experience first-hand how different factors enable or hinder teamwork.

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CHARACTERISTICS OF STUDENTS ADMITTED TO A WEB-BASED PHARMACY PROGRAM – A COMPARISON BETWEEN 2003 AND 2017

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Objective To compare characteristics of students enrolled in web-based pharmacy education over time, i.e. to compare the first cohort of students admitted in 2003 to those admitted in 2017.

Method A questionnaire was distributed to all first-year students admitted to the bachelor of pharmacy program at Umeå University in Sweden in 2017 (n=29). The results were compared with results from a previous questionnaire distributed to students admitted in 2003 (n=109). The response rates were 69% and 99%, respectively. The surveys contained questions about the students' background, living conditions, choice and expectations of the education and expectations of the future work setting. To compare age and gender, university admissions data was used.

Conclusion Student characteristics have changed over the years suggesting that the web-based pharmacy education attracts other groups of students today compared with when the program started. Exploring who enrols in a web-based pharmacy program may be helpful when it comes to curriculum planning, recruitment strategies and retention.

Results Compared to the 2003 cohort, students admitted in 2017 were younger and fewer were female and had dependant children. In 2017, a majority lived in the northern parts of Sweden (Table 1). In 2003, more students had an employment at time of admission (70% vs. 33%), and had previously studied at a university (44% vs. 25%). A majority of students admitted in 2017 stated that they would not have applied to the program if it had not been offered as a distance education. In the 2003 cohort, this was not as pronounced. Students were also asked where they wanted to work after graduation and most respondents, both in 2003 and 2017, wanted to work at a community pharmacy.

Table 1. Characteristics of the students admitted in 2003 and 2017

	2003	2017
Age (mean ± SD)	32.4 ± 8.0	27.8 ± 9.1
Female (%)	95	83
Dependant children (%)	55	25
Lived in Northern Sweden (%)	83	50

UMEÅ UNIVERSITY

INTEGRATED CURRICULA: AN INVESTIGATION OF THE ESPOUSED, ENACTED AND EXPERIENCED CURRICULUM

Andrew Mawdsley and Sarah C. Willis, The University of Manchester, UK

Objective: Explore how educators conceptualise and enact integration and how integration is experienced by learners within a four-year Master of Pharmacy curriculum.

Design: Educators (n = 8) took part in individual semi-structured interviews. Learners (n= 51) participated in focus groups (n= 8).

Espoused
- Shared understanding of integration between educators and learners
- Learner-centred
- Correlated subject matter (modular)
- Application of knowledge across disciplines

Enacted
- Modular curriculum structure
- Supports integrative thinking across subject lines
- Tension between disciplines/ideology restricts integration and was not fully realised
- Ability to enact integration varied between educators

Experienced
- Supports application of knowledge to practice
- Traditional assessment methods misaligned with teaching methods which perpetuates rote learning and knowledge compartmentalisation (in part due to a modular structure)
- Assessment methods (exams) work against teaching methods designed for integration; whereas teaching ethos changed the assessment design did not

Conclusion: Educators' difficulties in enacting integrated teaching, together with assessment methods that failed to support integrative teaching, suggest that the pedagogic potential for the curriculum may not be realised..

DOES A CARDIOLOGY IN CLINICAL PHARMACY PRACTICE MODULE EQUIP PHARMACISTS WITH THE KNOWLEDGE AND SKILLS TO OPTIMISE PATIENT CARE?

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[1] Trinity College Dublin, Ireland; [2] St. James's Hospital, Dublin, Ireland; [3] Tallaght University Hospital, Dublin, Ireland

Objective

To equip community and hospital pharmacists with the knowledge and skills to optimise cardiovascular patients' management, thereby improving patient safety and pharmaceutical care.

Methods

A CPD module was developed, in collaboration with pharmacists and doctors, covering eight cardiology topics and 'practice dilemma' sessions. It is primarily delivered via a virtual learning environment, with two face-to-face workshops, online assessment, casework and a reflective eportfolio.

Online survey (SurveyMonkey) with a mixture of 13 open and closed questions →

Survey link emailed to 211 pharmacists from 2013-2018 →

Analysis of results – use of Excel & descriptive statistics

Results

26% Response rate
37/55 from community pharmacy
52/55 were quite likely/extremely likely to recommend this module.

Most useful elements?
- Module's flexibility
- Staff support
- Opportunities to interact with both community and hospital practitioners
- Practical applicability of course content.

Has the Cardiology course helped you?

How useful were the learning materials?
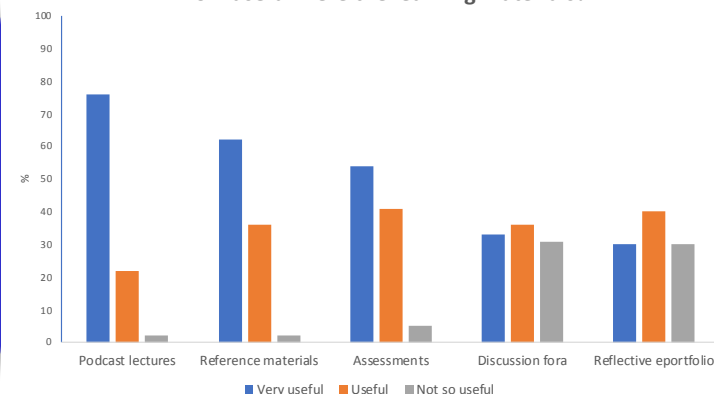
Conclusion

Based on self-reports, this module has supported pharmacists in gaining the knowledge and skills required to optimise cardiovascular patients' management.

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WORKFORCE DEVELOPMENT IN THE COMMONWEALTH: PROGRESS, CHALLENGES AND NEEDS

Sherly Meilianti[2], Lina Bader[2], Ian Bates[1,2], Devang Patel[2], Amy Chan[3]

[1] International Pharmaceutical Federation, The Hague, NL
[2] FIP Collaborating Centre, UCL School Pharmacy, London, UK
[3] Commonwealth Pharmacists Association, London, UK

The **objectives** of this study are: to examine the current state of workforce development; to identify relevant needs to further progress the workforce; and to establish recommendations for future workforce development projects.

Study Design

A systematic literature search of electronic databases (PubMed and EMBASE) to identify literature on pharmacy workforce development within the Commonwealth.

→

A survey to pharmaceutical organisations within the Commonwealth in 2018 to identify country-level progress towards implementing the FIP Pharmaceutical Workforce Development Goals.

Literature Search Findings

31 full text retrieved → 8 papers were included

Key Findings:
- Supply of workers
- Recruitment & retention
- Education & training
- Professional identity
- Migration

Survey Findings

14 out of 37 commonwealth countries responded to the survey sent our in 2017 and/or 2018.

Pharmaceutical Workforce Development Alignment per Country													
Country	Pharmaceutical Workforce Development Goal (PWDG)												
	1	2	3	4	5	6	7	8	9	10	11	12	13
Dominica													
Fiji									√				
St Lucia		√											
Uganda							√						
Sierra Leone	√	√	√										
Kenya	√	√	√				√	√					
South Africa		√	√	√	√	√	√			√	√		√
United Kingdom	√	√	√	√	√	√	√	√				√	√
Canada	√	√	√	√	√	√	√			√			
Malaysia	√	√	√	√	√	√	√						
Namibia	√	√	√	√	√	√				√	√		√
Singapore	√	√	√	√	√	√	√						
Australia	√	√	√	√	√	√	√						
Ghana	√	√	√	√	√	√	√						

Conclusion

- This study highlights wide variation of progress and needs across the Commonwealth.
- Further research is required to determine the most effective methods of addressing pharmacy workforce development needs.

SIMULATION IN PHARMACY EDUCATION: DEVELOPING STUDENTS' PROFESSIONAL AND LEADERSHIP SKILLS THROUGH AUTHENTIC PRACTICE BASED LEARNING

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University of Sussex

Objective: To develop 3rd year pharmacy students' professional, leadership and organisational skills.

Design: In GB, the Responsible Pharmacist Regulations (GPhC 2008) requires a Responsible Pharmacist (RP), to be present in each Registered Pharmacy. To prepare students for this responsibility we developed a simulated community pharmacy to attain the attribute required.

| Secure the safe and effective running of the pharmacy | Display a notice | Complete the pharmacy record | Establish, maintain and review pharmacy procedure |

Responsible Pharmacist

In years 1 and 2, pharmacy students undertake dispensing workshops using a didactic methodology guided by faculty. To progress students from dependent learners through interested and involved stages to becoming self-directed learners (Grow 1991), an interactive workshop, simulating community pharmacy practice was developed. Teams of 3 'staffed' a pharmacy. One student was assigned the role of RP and was responsible for the leadership, organisation and supervision of the team combined with the quality of work produced.

Student	Teacher
Dependent	Coach
Interested	Motivator
Involved	Facilitator
Self-directed	Consultant

GROWs model
Source: Grow 1991

Scenarios given and tasks the teams had perform
Delivery of Stock
Staff Management
Clinical questions from medical practitioners
GPHC inspector visits
Provision of Advanced pharmacy services (PSNC 2019)
Medication errors
Enquiries for over the counter medication
Dispensing

Results: Consensus opinion was that the workshops helped to equip the students for their future professional roles, supporting evidence of self-directed learning. They developed skills needed for prioritisation and dealing with interruptions.

Conclusion: Simulation enabled students to demonstrate their organisation and leadership skills, knowledge of RP legislation, and application of risk strategies to reduce patient harm, and show empathy.

Anonymised student feedback and portfolio entries indicated the sessions were highly engaging. "Rx *review sessions was amazing, loved the additions*", "*…worth repeating*".

CLINCAT – NATIONAL UTILISATION OF A COMPETENCY ASSESSMENT TOOL FOR AUSTRALIAN PHARMACISTS

Kristin Michaels, Kylee Hayward, Sally Ridgers

The Society of Hospital Pharmacists of Australia (SHPA)

Background

In 2010, SHPA developed and implemented a national competency assessment tool, the ClinCAT.

Development of the tool was informed by the UK General Level Framework, the SHPA standards of Practice for Clinical Pharmacy Services, the Australian Pharmaceutical Advisory Committee Guidelines and the National Competency Standards Framework for Pharmacists in Australia.

The tool is designed to assist with and facilitate practitioner development through peer observation and feedback.

Objective

To provide training for pharmacists in the use of the ClinCAT to enable national utilisation of the tool.

Method

To facilitate national uptake of the ClinCAT, SHPA developed a 2-day interactive workshop for prospective evaluators.

Training was piloted in South Australia and Victoria in 2010/11, with in-depth feedback collected from participants.

Pilot results were used to develop a sustainable training model that could be delivered nationally. Workshops are small group (12-15 participants). Key elements of the training include:
- Ethos of ClinCAT
- Feedback training
  - Introduction to ALOBA model of feedback
  - Skills acquisition through structured tole play scenarios
- Change management / workplace implementation

Three post workshop ClinCAT evaluations are required to become a certified evaluator.

Revalidation as an evaluator is required after five years.

Results

- 56 evaluator training workshops have been offered nationally since 2010/11.

- 640 pharmacists have attended the training.

- 60% complete the post-workshop requirements to become a certified evaluator.

- ClinCAT evaluators are located at over 100 hospitals and health services across Australia.

Conclusion

- ClinCAT has been integrated into practice in the majority of hospitals and health services in Australia.

- Ongoing regular evaluator training workshops are offered to ensure sufficient numbers of practicing evaluators.

+shpa

A NOVEL APPROACH TO THE DESIGN OF A FULLY INTEGRATED CLINICALLY ENHANCED PHARMACIST INDEPENDENT PRESCRIBING PROGRAMME IN THE UK

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UCL

Background

Pharmacists need advanced skills to competently manage patients with health assessment, diagnostic and clinical examination skills to fulfil these roles.

UCL aimed to design a novel prescribing course with fully integrated physical assessment skills teaching that would develop pharmacists with the skills to take on these new roles.

Course design

The course was uniquely developed through co-creation by a team of practicing and academic pharmacists using constructive alignment (Biggs, 2003)

The course aimed to develop pharmacists with the skills to make an informed decision at each and every instance of prescribing.

The course design utilised a blended learning approach (Garrison, 2004) with real life case studies and reflective questions to embed learning in practice.

Clinically enhanced: history taking and physical examination of nine body systems.

History taking and developing skills in diagnosis	Mental health assessment
Respiratory	Abdominal
Cardiovascular	Peripheral vascular and lymphatic
Musculoskeletal	Ear, nose and throat
Neurological system	Visual acuity and ophthalmoscopy

Evaluation design

End of each study day questionnaire	End of course questionnaire to all students	Thematic analysis
End of course questionnaire to all DMPs	End of course Focus groups with students	
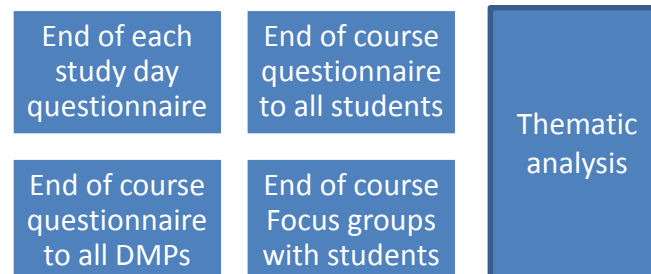
Results

Pharmacists chose the course because it was designed by pharmacists, for pharmacists, and because of the clinical skills it would enable them to develop.

The case study approach was well-received by the students and they learnt skills they can take into their practice

The course changed the way that the pharmacists consult and the way that they practice pharmacy. They had a better understanding of the patient journey and felt confident to expand their skills once qualified.

Conclusion

Student feedback suggests that using co-creation has developed a course that will enable pharmacists to take on new roles.

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Making Expert Thinking Visible: Cognitive Apprenticeship in Pharmacy Education
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Center for Innovative Pharmacy Education and Research

BACKGROUND

- Schools of pharmacy are exploring new curriculum structures to meet increasing demands from the healthcare system and to better align with evolving roles of pharmacists.[1]
- **Cognitive Apprenticeship (CA) theory**[2] describes **optimal learning environments** and provides **actionable strategies** for designing and implementing effective teaching practice to support study learning.
- Research suggests Cognitive Apprenticeship theory, which is rooted in making expert thinking visible to learners, is an effective framework for the health professions.
  - However, few studies clearly describe the types of teaching activities that align with the CA framework.[3]

OBJECTIVE

- The purpose of the student was to identify aspects of CA that pharmacy educators use in their teaching practice. In doing so, we aimed to described strategies for explicating experience thinking within didactic environments.

METHODS

- Five pharmacy educators from the Eshelman School of Pharmacy provided access to to previously recorded didactic class sessions.
- A priori codes were adapted from Ahn,[4] who created codes based on CA dimensions and sub-dimensions.[2]
- Summaries for each participating pharmacy educator were crafted and an overall summary report was generated.

RESULTS

Cognitive Apprenticeship Dimensions & Sub-dimensions

Content	Methods	Sequencing	Sociology
• Domain Knowledge*	• Modeling	• Increasing complexity* (depth)	• Situated learning
• Heuristic strategies	• **Explanation***	• Increasing diversity[0] (breadth)	• **Community of practice***
• Control strategies[0]	• Coaching/ Scaffolding	• Global to local skills	• Collaboration*
• Learning strategies*	• **Reflection/ Articulation***		
	• Exploration[0]		

Bold denotes the three most frequently used CA sub-dimensions observed in didactic class sessions. * denotes sub-dimensions used by all participants, 0 denotes were not expressed by participants.

Most Prevalent ↑ Least Prevalent

Faculty class sessions were characterized by four different cycles:

1. Reflection/Articulation → Community of Practice → Explanation
- Cycle happened with and without technology
- Served as a Formative assessment

2. Reflection/Articulation → Collaboration → Community of Practice → Explanation
- Application, Analysis, and Evaluation of knowledge

3. Community of Practice → Explanation
- Represented periods of time where students posed questions to faculty
- Occurred either at the beginning of class, end of class, or after an extended Explanation segment

4. Reflection/Articulation → Coaching/Scaffolding → Community of Practice → Explanation
- Rare, but reflected the faculty member supporting student thinking and understanding

CONCLUSIONS

- Pharmacy education faculty constructed didactic learning environments reflective of Communities of practice, where students and faculty worked collaboratively to engage with Domain knowledge.
- CA Methods, specifically Explanation and Reflection/Articulation, are associated with active learning strategies which support student learning.

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cipher.

Assessment of Jordanian student competence in Medication Reconciliation Simulation.

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Background: Taking the Best Possible Medication History (BPMH) has been described as an Entrustable Professional Activity (EPA) for Pharmacy students. The BPMH is also the first crucial step in performing medication reconciliation to ensure a patient is prescribed and administered the correct medicines. Students should be assessed on their competence to perform this EPA in the classroom to prepare them for clinical practice.

Objective: To investigate the impact of a medication reconciliation course utilising in-classroom simulation, observation and immediate feedback on students' performance over time, as well as changes in the self-perceived confidence and competence.

Design: In 2016, over a three-day course, fourth- and fifth-year pharmacy students from ASU were assessed by roleplay on their BPMH taking and reconciliation skills. Students received immediate feedback after assessment, and observed peers undergo the assessment process. Comparison of student scores (one-way ANOVA) was performed to detect differences in scores across the 3 days. Pre- and post-simulation questionnaires and focus groups enabled collection of quantitative and qualitative data pertaining to student self-perceived confidence and competence (paired t-tests), perceptions, experiences and usefulness of the course (qualitative).

Results: Assessment-based competence scores demonstrated significant improvement in student performance between day 1 and day 2 ($p<0.001$) and day 1 and day 3 ($p<001$) (See Table). Self-perceived confidence and competence scores also significantly improved after the intervention (3.9 v 4.46; $P<0.001$), ($P<0.05$) respectively. Focus group analysis yielded positive responses, such as: students valued receiving feedback on performance

Conclusion: Simulation with feedback was a useful tool to teach pharmacy students medication reconciliation skills in Jordan.

Day of Assessment	Number of Students Assessed	Number of Students with Satisfactory Score (%)	Mean Score	SD
Day 1	36	27 (75%)	26.1	7.7
Day 2	31	30 (97%)	32.7	6.2
Day 3	28	26 (93%)	33.8	5.2
Total	95	83 (87%)	30.5	7.4

THE UNIVERSITY OF SYDNEY

ASU APPLIED SCIENCE UNIVERSITY

DESCRIBING THE USE OF CAPSTONE ASSESSMENTS WITHIN PHARMACY EDUCATION

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Center for Innovative Pharmacy Education and Research

BACKGROUND

- **Assessment of student progress and practice readiness** is an important aspect of student and curricular development
  - The United States Accreditation Council of Pharmaceutical Educators Standards and the Center for the Advancement of Pharmacy Education 2013 Educational Outcomes address the need for these types of assessments[1,2]
- Formal assessments designed to **evaluate students' ability to connect the multiple components of their academic experiences**, also known as capstone assessments, are increasingly common in health professions education
- Within pharmacy education, there have been several published reports **describing the implementation of capstones** within the doctor of pharmacy curriculum[3-7]
- To date, there has not been a holistic review of capstone use within pharmacy education

OBJECTIVE

- To describe the current state of capstone assessments within pharmacy education literature

METHODS

- Literature review:
  - Search terms – [capstone, "pharmacy education"]
  - Database – PubMed
  - 15 articles from 13 different institutions were found that described the institution's capstone experience
    - Articles published between 2007 and 2017
- Information extracted from each relevant article included:
  - Capstone purpose
  - Capstone utility
  - Incentive(s) associated with capstone
  - Consequence(s) associated with capstone
  - Capstone logistics
  - Capstone assessment strategy
  - Capstone resource requirements

RESULTS

Capstone Purpose and Utility

Evaluate rotation readiness	Assess student ability to synthesize content from multiple courses	Identify areas of student weakness	Provide student with research/scholarship experience

Capstone Assessment Feedback

Use of capstone results:
- Curriculum development and optimization
- Targeted student feedback and remediation
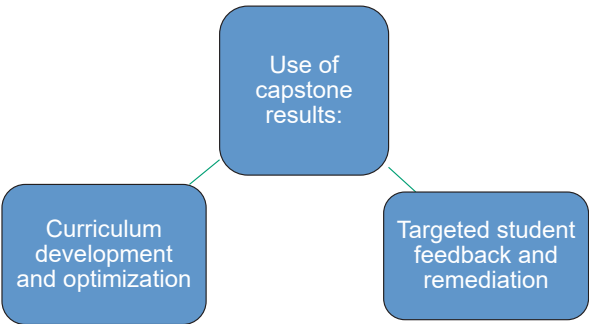
Capstone Implementation and Variability

- Majority of **capstones implemented as a course** within the institution's curriculum
- Majority of capstones were **resource intensive** in relation to:
  - Faculty hours required for development and execution
  - Teaching assistants required for instruction and assessment
- **Variability between capstone experiences** found within:
  - Content evaluated during capstone assessment
  - Student incentives and consequences associated with assessment
  - Outcomes used to define capstone experience

CONCLUSIONS

- A **variety of capstone designs are utilized** within pharmacy education to evaluate student readiness for clinical rotations and provide specific feedback for student and curriculum development
  - Majority of capstone assessments were courses that utilized case-based learning to prepare students for rotations
- The following **gaps in the literature** were identified:
  - Use of capstones as a threshold for student progression
  - Identifying a standard definition of clinical rotation readiness
  - Determining the cost effectiveness and sustainability of a capstone

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cipher.

INTEGRATION OF THE PHARMACISTS' PATIENT CARE PROCESS IN AN INTEGRATED PHARMACOTHERAPY COURSE SERIES

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UNC | ESHELMAN SCHOOL OF PHARMACY

BACKGROUND

- Recognizing the need for a consistent process in the delivery of patient care across the profession, the Joint Commission of Pharmacy Practitioners (JCPP) released the Pharmacists' Patient Care Process (PPCP)[1]
  - Process was designed to be applicable to any practice setting where pharmacists provide patient care and for any patient care service provided by pharmacists
  - Goal is to improve patient health through integration of a comprehensive and consistent process for pharmacists working as members of the health care team

- PPCP is now incorporated into the accreditation standards within the United States[2,3]

OBJECTIVE

- To evaluate student performance on the five steps of the PPCP in the integrated pharmacotherapy (iPHTH) class series and assess student performance progression

METHODS

- At our institution, the PPCP was integrated into the three semester iPHTH class series beginning in the second semester of the second year
- Deliverables for the class series include written Pharmacist Patient Care Process Tables and Clinical Decision Making Summaries evaluated by case experts and faculty
- Students were assessed on each step of the PPCP using the entrustable professional activities (EPA) assessment tool
  - 1 = Dependent
  - 2 = Assisted
  - 3 = Supervised
  - 4 = Independent
  - 5 = Supervise others

METHODS (CONTINUED)

Table 1: EPA entrustment expectations in iPHTH

PPCP Component	Corresponding EPA	Written Assessment Related Section(s)	iPHTH I Expectation	iPHTH II Expectation	iPHTH III Expectation
Collect	Collect pertinent medication and medical information	Background patient information Findings	Supervised (3)	Supervised (3)	Supervised (3)
Assess	Prioritize and develop an assessment of the patient's medication therapy problems	PQA classification Assessment	Assisted (2)	Assisted (2)	Supervised (3)
Plan	Utilize evidence-based approach to advance patient care	Rationale References	Assisted (2)	Assisted (2)	Supervised (3)
Plan	Develop a patient-centered care plan in collaboration with the care team	Recommendations	Assisted (2)	Assisted (2)	Supervised (3)
Implement	Provide medication education to patients and/or caregivers	Recommendations	Assisted (2)	Assisted (2)	Supervised (3)
Follow-up	Monitor response to medication therapy	Recommendations	Assisted (2)	Assisted (2)	Supervised (3)

RESULTS

Table 2: EPA entrustment assessment in iPHTH

PPCP Component	Corresponding EPA	Class Cohort	iPHTH I Assessment	iPHTH II Assessment	iPHTH III Assessment
Collect	Collect pertinent medication and medical information	Class 1 (n = 143)	1.9 ± 0.4	2.8 ± 0.3	3.2 ± 1.2
Collect	Collect pertinent medication and medical information	Class 2 (n = 144)	2.0 ± 0.1	2.4 ± 0.6	--
Assess	Prioritize and develop an assessment of the patient's medication therapy problems	Class 1 (n = 143)	1.9 ± 0.4	2.8 ± 0.3	3.2 ± 1.2
Assess	Prioritize and develop an assessment of the patient's medication therapy problems	Class 2 (n = 144)	2.0 ± 0.1	2.4 ± 0.6	--
Plan	Utilize evidence-based approach to advance patient care	Class 1 (n = 143)	2.4 ± 0.8	2.8 ± 0.3	3.3 ± 1.4
Plan	Utilize evidence-based approach to advance patient care	Class 2 (n = 144)	1.9 ± 0.5	2.8 ± 0.7	--
Plan	Develop a patient-centered care plan in collaboration with the care team	Class 1 (n = 143)	2.4 ± 0.8	2.8 ± 0.3	3.3 ± 1.2
Plan	Develop a patient-centered care plan in collaboration with the care team	Class 2 (n = 144)	1.9 ± 0.5	2.4 ± 0.6	--
Implement	Provide medication education to patients and/or caregivers	Class 1 (n = 143)	2.4 ± 0.8	2.8 ± 0.3	3.3 ± 1.4
Implement	Provide medication education to patients and/or caregivers	Class 2 (n = 144)	2.0 ± 0.4	2.4 ± 0.6	--
Follow-up	Monitor response to medication therapy	Class 1 (n = 143)	2.4 ± 0.8	2.8 ± 0.3	3.3 ± 1.2
Follow-up	Monitor response to medication therapy	Class 2 (n = 144)	1.9 ± 0.5	2.4 ± 0.6	--

*Data represented as mean ± SD

CONCLUSIONS

- Within each iPHTH class, the mean EPA assessment for each component of the PPCP met or exceeded the expectations for performance, and the performance of each component of the PPCP increased as students progressed through the series
- Implementing the PPCP within the iPHTH class series provided students with the opportunity to connect pharmacotherapy learning and assessment to the PPCP that is utilized within practice

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PHARMACY STUDENT CHARACTERISTICS ASSOCIATED WITH SUCCESSFUL ACCEPTANCE INTO A PHARMACY POST-GRADUATE TRAINING PROGRAM

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BACKGROUND

- Over the past several years, acceptance into pharmacy post-graduate training residency programs has become increasingly competitive[1]
  - There has been a 98% increase in the number of pharmacy students pursuing residency between 2008 and 2014[2]
- Consequently, pharmacy residency application reviewers and interviewers spend a significant amount of time, effort, and resources screening applications and ranking candidates to assess the best fit for their residency program
- There have been a few previous attempts to identify applicant characteristics associated with offering a residency program interview and matching success[3,4]
  - Surveys of pharmacy residency directors found pharmacy school reputation and strong letters of recommendation and intent as priorities for granting a residency program interview[5,6]
  - Evidence supporting specific strategies to streamline the application process for residency programs is lacking
- The University of North Carolina Medical Center's (UNCMC) Health-System Pharmacy Administration (HSPA) residency program is a 24-month program which accepts four residents per year
  - Over the last 4 application cycles, the number of applicants for the HSPA residency program has increased by 33%, resulting in 154 applications for 16 available positions
  - A need exists to identify opportunities to streamline and optimize the application process

OBJECTIVE

- To identify characteristics associated with successful invitation to interview and final ranking for the UNCMC's HSPA residency program

METHODS

- All candidate's who applied during the 2015 – 2016, 2016 – 2017, and 2017 – 2018 application cycles were including within the evaluation
- Data collected for each applicant included:
  - Academic performance
  - Pharmacy school ranking
  - Prior pharmacy work experience
  - Prior research experience
  - Pharmacy organization involvement
  - Number of scholarships and awards received
- Applicants from the 2018 – 2019 application cycle were used for validation of the developed models
- Statistical analyses performed included:
  - Bivariable analyses for planned stratifications of applicants according to whether applicants were offered an on-site interview and final rank among candidates interviewed
  - Advanced regression modeling to identify predictors of applicants offered an on-site interview
  - Agreement statistics to validate the predictive computational models

RESULTS

- There were 154 applicants included over four application cycles
  - 115 applicants were within the application cycles evaluated for characteristics associated with invitation for interview and final ranking
  - 39 applicants were contained within the application cycle used for validation of analyses

Table 1: Characteristics of applicants offered on-site interview

Variable	Offered Interview (n = 70)	Not Offered Interview (n = 45)	p-value
Undergraduate grade point average, median (IQR)	3.47 (3.27-3.76)	3.4 (3.27-3.72)	0.7
Pharmacy school ranked in top 25%, n (%)	46 (65.7)	24 (53.3)	0.18
Pharmacy school grade point average, median (IQR)	3.63 (3.46-3.79)	3.35 (3.2-3.49)	<0.001
Prior undergraduate degree, n (%)	46 (65.7)	23 (51.1)	0.12
Additional graduate degree, n (%)	9 (12.9)	7 (15.6)	0.68
Hospital pharmacy technician experience, n (%)	6 (8.6)	6 (13.3)	0.53
Hospital pharmacy intern experience, n (%)	49 (70)	17 (37.8)	0.001
Community pharmacy technician experience, n (%)	20 (28.6)	10 (22.2)	0.45
Community pharmacy intern experience, n (%)	42 (60)	28 (62.2)	0.81
Poster presentation during pharmacy school, n (%)	56 (80)	27 (60)	0.02
Publication during pharmacy school, n (%)	8 (11.4)	9 (20)	0.21
National organization leadership position, n (%)	29 (41.4)	9 (20)	0.03
University organization leadership position, n (%)	66 (94.3)	40 (88.9)	0.29
University organization president, n (%)	39 (55.7)	19 (42.2)	0.16
Total organization involvement, median (IQR)	5 (4-7)	5 (3-6)	0.08
Total awards, median (IQR)	1.5 (0-3)	1 (0-2)	0.13
Total scholarships, median (IQR)	2 (1-3)	1 (0-2)	0.002

Table 2: Characteristics of applicants in final top 8 ranking

Variable	Ranked in Top 8 (n = 24)	Not Ranked in Top 8 (n = 91)	p-value
Undergraduate grade point average, median (IQR)	3.44 (3.30-3.77)	3.47 (3.27-3.72)	0.61
Pharmacy school ranked in top 25%, n (%)	18 (75)	52 (57.1)	0.16
Pharmacy school grade point average, median (IQR)	3.68 (3.51-3.80)	3.48 (3.23-3.70)	0.003
Prior undergraduate degree, n (%)	19 (79.2)	50 (54.9)	0.06
Additional graduate degree, n (%)	4 (16.7)	12 (13.2)	0.74
Hospital pharmacy technician experience, n (%)	1 (4.2)	11 (12.1)	0.46
Hospital pharmacy intern experience, n (%)	17 (70.8)	49 (53.8)	0.17
Community pharmacy technician experience, n (%)	8 (33.3)	22 (24.2)	0.43
Community pharmacy intern experience, n (%)	15 (62.5)	55 (60.4)	0.9
Poster presentation during pharmacy school, n (%)	18 (75)	65 (71.4)	0.8
Publication during pharmacy school, n (%)	2 (8.3)	15 (16.5)	0.52
National organization leadership position, n (%)	10 (41.7)	28 (30.8)	0.34
University organization leadership position, n (%)	24 (100)	82 (90.1)	0.2
University organization president, n (%)	16 (66.7)	42 (46.2)	0.1
Total organization involvement, median (IQR)	5 (4-6)	5 (4-7)	0.9
Total awards, median (IQR)	2 (0.5-2.5)	1 (0-2)	0.24
Total scholarships, median (IQR)	1 (0-3)	1 (0-2)	0.51

Table 3: Relative descriptor importance for applicants offered interview

Variable	Descriptor Importance (%)
Pharmacy school grade point average	61
Total scholarships	18
Hospital pharmacy intern experience	8
National organization leadership position	5
University organization leadership position	3
Total organization involvement	1
Undergraduate grade point average	1
Prior undergraduate degree	1
Total awards	1
University organization president	1
Poster presentation during pharmacy school	0
Hospital pharmacy technician experience	0
Additional graduate degree	0
Publication during pharmacy school	0
Pharmacy school ranked in top 25%	0
Community pharmacy intern experience	0
Community pharmacy technician experience	0

Regression Modeling and Validation Findings

- Applicants were more likely to be offered an on-site interview if:
  - Had previous work experience as a hospital intern irrespective to GPA and number of scholarships
  - No previous work experience as a hospital intern and:
    - > 3 scholarships awarded and GPA > 3.25
    - > 1 scholarship awarded and GPA > 3.4
    - 1 scholarship awarded and GPA > 3.5
    - 0 scholarships awarded and GPA > 3.85
- Agreement statistics analyses including applicants from the 2018 – 2019 application cycle (n = 39):
  - Model including hospital intern experience, GPA, and number of scholarships:
    - Kappa = 0.22 indicating fair agreement
  - Model including GPA and number of scholarships
    - Kappa = 0.52 indicating moderate agreement

CONCLUSIONS

- Objective criteria within the realms of academic performance and prior work experience may be useful to streamline the application screening process for post-graduate training programs
- Pharmacy school GPA was the only objective characteristic found to be associated with applicant final ranking
- If pharmacy schools trend towards implementing pass/fail curricula, it will be imperative to realize other indicators of academic performance
- Future research is needed to determine best practices for analyzing subjective applicant attributes

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AN EVALUATION OF PHARMACEUTICAL WORKFORCE AND PHARMACY EDUCATION USING THE FIP'S WORKFORCE DEVELOPMENT GOALS: A CASE FROM QATAR

Banan Mukhalalati[1], Meram Ibrahim[1], Ahmed Awaisu[1]
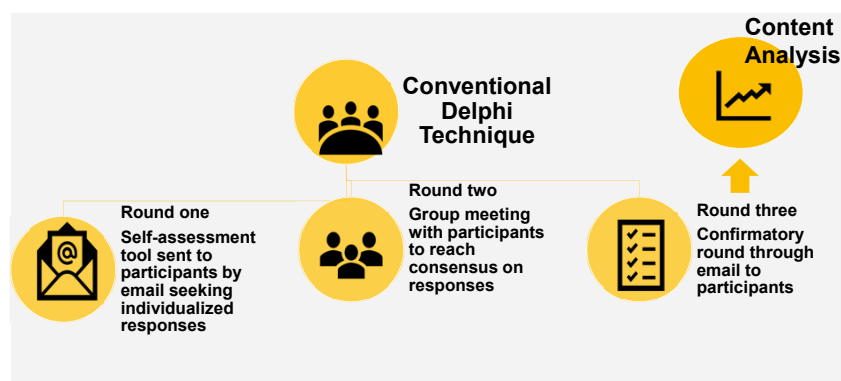[1]College of Pharmacy, Qatar University, PO Box 2713, Doha, Qatar

1 Introduction

- WHO estimates a healthcare workforce shortage of 12.9 million by 2030, which constrains the achievement of Sustainable Development Goals
- Several reports on the pharmacy workforce published by FIP indicates shortages of pharmacists in all sectors
- Data regarding the Eastern Mediterranean Region (EMR) highlights a disconnection between education, regulations, and practice
- Available literature in Qatar did not discuss workforce intelligence in terms of capacity planning and development

2 Research Objectives

- Conduct a self-assessment of pharmacy education and workforce in Qatar in relation to the FIP's Pharmaceutical Workforce Development Goals (PWDGs)
- Prioritize the identified gaps
- Recommend potential solutions to address them

3 Methods

Content Analysis

Conventional Delphi Technique

Round one
Self-assessment tool sent to participants by email seeking individualized responses

Round two
Group meeting with participants to reach consensus on responses

Round three
Confirmatory round through email to participants

Setting	• Ministry of Public Health (MOPH) • College of Pharmacy Qatar University (CPH)
Participants	Leaders of pharmacy practice and education in Qatar • 5 from CPH • 6 from MOPH
Data collection tool	FIP validated self assessment survey tool utilizing Conventional Delphi Approach
Data analysis:	Content analysis

4 Results

The Academy Cluster
- CPH is expanding its capacity, but not based on national needs
- Quality assurance tasks are carried out yearly
- Stakeholders are not involved in policy development

The Professional Development Cluster
- There is no common understanding of specialization and advanced practice
- Lack of competency framework ladder

The System Cluster
- Lack of workforce policy intelligence
- Lack of workforce policy

Identified Gaps from each Cluster

Increasing the academic capacity is not based on national needs
Academy

Lacking of a competency framework
Professional Development

Lacking workforce intelligence and workforce policies
Systems

The Priority Gaps

Establishment of national pharmacy association

Development of competency framework

Further research related to workforce intelligence

Possible Solutions

5 Conclusions

- PWDGs are interrelated and a gap in one goal can negatively influence other goals
- Increasing the educational capacity based on national needs, (PWDG 1) in the academy cluster, cannot be achieved without workforce intelligence and workforce planning, (PWDG 12) in the systems cluster
- Lacking a competency framework, (PWDG 5) in the professional development cluster, has negatively impacted other professional development goals , leadership development (PWDG 6) and the advanced and specialists expert development goal (PWDG 4)
- Countries in the EMR should ideally collaborate in initiating regional workforce transformation strategies

كلية الصيدلة
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A systematic review to investigate the impact of integrated curriculum on undergraduate healthcare students

H.Nazar, A. Khan, A. Husband

Objectives: Integrated curricula is being adopted within healthcare programmes with a growing number of curriculum evaluations being undertaken and reported. A framework exists to guide educationalists in the planning, design and implementation of integrated curricula. This study presents a systematic appraisal of the evidence on how healthcare students experience and perform within integrated interventions. Six electronic databases: Medline, Embase, Scopus, Psych-INFO, CINHAL and ProQuest were systematically searched in September 2018. Studies reporting on undergraduate healthcare students providing feedback, or performing at an assessment after experiencing integrated curricula were included. Studies were assessed for methodological quality and risk of bias using the Joanna Briggs Institute critical appraisal checklist. Studies were appraised against the implementation framework to facilitate contextual understanding of the intervention and findings.

Findings: Forty studies from programmes in medicine, pharmacy and dentistry worldwide met the inclusion criteria and were included (Fig 1). Interdisciplinary level integration was the most widely adopted, with a wide range of teaching and learning strategies employed in the delivery. Students appear to perform similarly or conservatively better after experiencing integrated education, however adopted study designs preclude the deduction of a direct causal relationship. Students report generally positive feedback on their integrated experiences, claiming the development of a wide range of skills. However, authors provide insufficient detail about the integrated educational developments to best inform future educationalists on the best systems for curriculum integration.
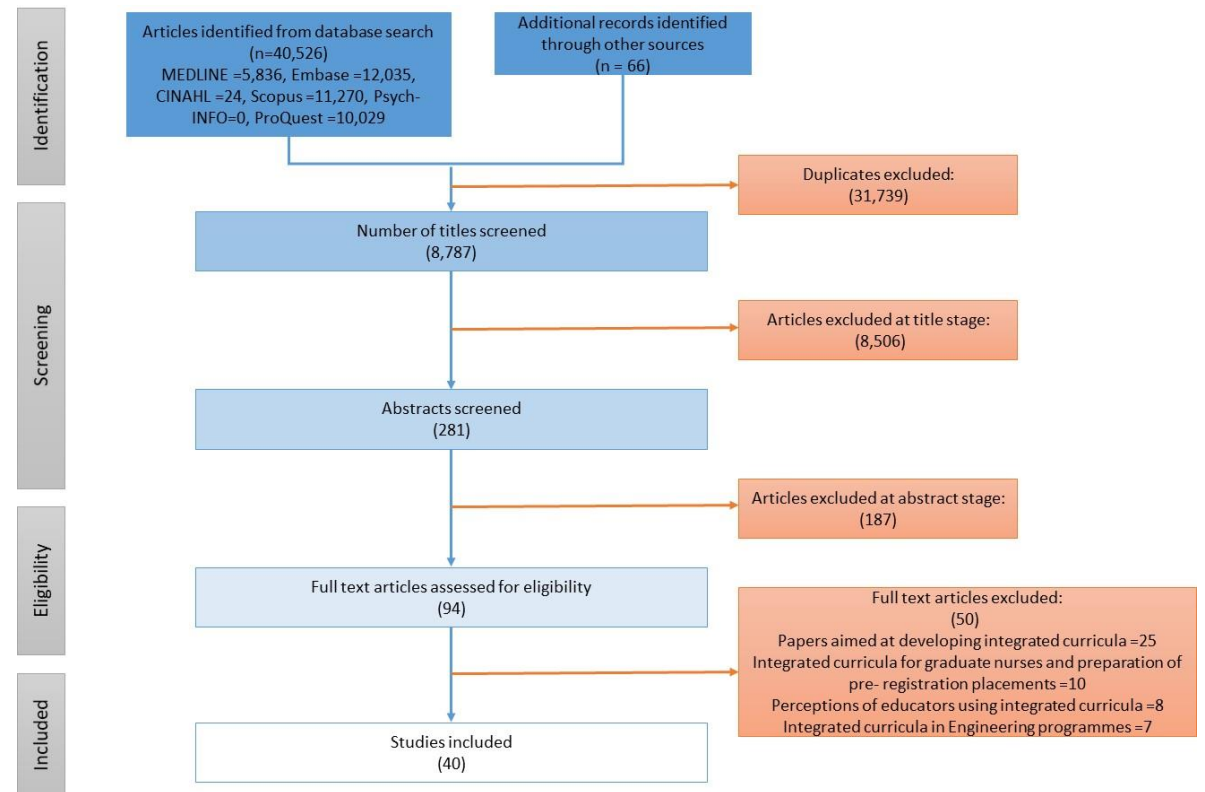
Figure 1. PRISMA diagram to show the stages of searching

Summary: There is an impetus in research purporting best practices in curriculum integration, however, more standardised, evidence-informed design and reporting of interventions and their outcomes are required to strengthen evidence in this area.

DEVELOPING A SCAFFOLD TO CONCEPTUALISE THE RELEVANCE OF INTEGRATION IN CLINICAL PRACTICE: PREPARATION FOR AN INTEGRATED THERAPEUTICS WIKI PROJECT

Tin Wai Terry Ng, Clare Linkins, John Malkinson, Mine Orlu, Adam Phillips, David West, Andrew F Wilderspin on behalf of the UCL SoP Integrated Wiki Project Team

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UCL

OBJECTIVE:

Final year MPharm students at UCL, complete an Integrated Therapeutics Wiki Project. This is an innovative learning activity designed to help students make connections between topics from different pharmaceutical disciplines by creating concept maps and MediaWiki pages. Feedback from the 2016-17 cohort highlighted that some students did not always understand how to approach the tasks, nor the relevance to their learning. In response, the Wiki project team developed an introductory workshop and feedback schedule during the project to provide a more solid supporting scaffold (Wood *et al*, 1976).

DESIGN:

The workshop centred on a patient case to highlight the relevance of integration in practice. Students were introduced to the principles of concept mapping and how to make links between topics before making their own concept maps in teams (Figure 1), using topics related to the patient case. Students received feedback from staff and peers, and the workshop concluded with an example map that demonstrated how integration of different disciplines was relevant to the patient case. The workshop was evaluated using a questionnaire.

RESULTS:

Figure 2: Questionnaire responses (N=50)

- The workshop helped me to understand the idea of concept mapping
- I would recommend attending this workshop to my colleagues in the years below
- I would have found it difficult to start my own Wiki map without the workshop
- The use of a patient case in the workshop helped me to understand the relevance of connecting pharmaceutical sciences and clinical practice

% ▪ Agree ▪ Strongly Agree

Figure 1: Team Concept Mapping Exercise

"The most useful part was making the connections on the board with the pins and the tape. It helped to see visually the map to understand how the topics linked and what possible connections could occur. It was also interactive and fun to do."

"[got] some hands on work doing the map, [saw] how other students would connect their topics"

"More info on what makes a good link (i.e. what is a weak link compared to a strong link?)"

"Advice on how to.. start the map with the 5 topics. More advice on how to ensure map is integrated…"

Figure 3: Student Feedback- What was useful ▪ and What could be done differently ▪

CONCLUSION:

Results suggest students have found the workshop a useful scaffold to support them with the Wiki project. Feedback with regards to improvement have been acted on and incorporated into the 2019-20 workshop.

REFERENCE: Wood D; Bruner JS; Ross G (1976) The role of tutoring in problem solving, *Journal of Child Psychology and Psychiatry*,17:89-100

THE QUALITIES OF AN EFFECTIVE WORK-BASED PHARMACIST TUTOR

Adenola Olayide, University College London; Graham Davies, Kings College London; Barry Jubraj, Kings College London

Objective: To identify the key qualities of an effective Work-Based Pharmacist Tutor (WBPT)

Design: A literature review was conducted which informed the design of an e-questionnaire using a Likert scale. This consisted of qualities grouped under three clusters: educator, practitioner and personal qualities. Sixteen expert reviewers were selected from three major pharmacy sectors namely hospital, academia and community, based on their level of educational experience. A modified Delphi technique was selected based on literature review findings. Experts ranked their top qualities from a list of qualities in the e-questionnaire. Consensus was deeded to be met when 80% or more of the experts found a quality to be necessary.

Results: Experts agreed upon 36 qualities of a WBPT after the first modified Delphi round. A second modified Delphi round reduced the number of agreed qualities to 20. The top six qualities ranked by the experts were 1) Be a good communicator; 2) Encourage trainees to reflect on their practice; 3) Display honesty, trustworthiness and integrity; 4) Be able to consult effectively with patients; 5) Possess the appropriate knowledge and skills to practise; 6) Be a role model and practise ethically. These results coheres with literature findings for other health professions including medicine, dentistry and nursing.

Conclusion: This study has identified 20 agreed qualities that cohere with other health professions and map against the Advanced Pharmacy Framework of the Royal Pharmaceutical Society. We recommend that the pharmacy regulator (General Pharmaceutical Council) and Health Education England consider incorporating these qualities in WBPT training programmes. We hope that developing these qualities in Work- Based Pharmacist Tutors will raise the standard of tutoring in the profession. Future research could be undertaken to validate the agreed qualities in this study.

THE USE OF A POLLING SYSTEM TO REINFORCE HEALTH OUTCOMES PRINCIPLES

Manny Papadimitropoulos
Leslie Dan Faculty of Pharmacy, University of Toronto, Toronto, Canada

Objective: Enhance understanding of basic health outcomes principles by using polling software (Poll Everywhere) based on findings by Brown et al 2014.
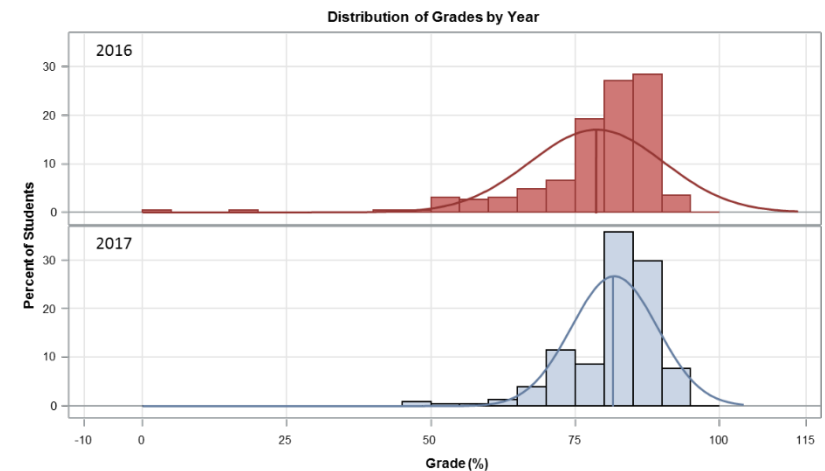
Method: Students were surveyed with either a smartphone or laptop in the classroom. Polling software was implemented in the second offering of the course. Students were asked to provide feedback on the perceived impact during final course evaluation. Analysis consisted of a comparison of the mean and median grades of the final exam between the intervening year and the previous non-intervention year.

Results: Students performed better in the intervention year that used polling software than the session that did not: 81.8% (7.47) versus 78.8% (11.63) (mean (SD)). Given unequal variances a two sided t test Satterthwaite with t-value of -3.36. Confounding factors that were not considered included educational background of the students in each of the years, and lecture attendance rates.

Conclusion: Use of polling during lecture delivery improved exam scores and resulted in more positive qualitative comments from students in the final course evaluation for the session.

Reference
Brown AE, Thomas NJ, Thomas LY. (2014). Students' willingness to use response and engagement technology in the classroom. J. of Hospitality, Leisure, Sport & Tourism Education 15:80-85.

Distribution of Grades by Year

INTEGRATED THERAPEUTICS: USING CONCEPT MAPPING AND MEDIAWIKI TO HELP YEAR 4 MPHARM STUDENTS CONNECT THE DOTS

Adam Phillips, David West, Andy Wilderspin, Mine Orlu, Terry Ng, Claire Linkins, John Malkinson, Audrey Mercer, Rebecca Lever, Sudax Murdan, James Phillips, Satyanarayana Somavarapu, Catherine Tuleu, Geoff Wells, Brian Pearce
UCL SCHOOL OF PHARMACY, BRUNSWICK SQUARE

Objective:

Pharmacy is underpinned by a broad range of disciplines. The pharmacist needs to be able to make efficient use of this diversity of information in their professional and clinical practice. The graduating student has typically compartmentalised their knowledge and would benefit from the integrated understanding that usually develops with experience. The project aims to accelerate this process by using constructivism to facilitate a way of thinking that promotes a more connected view of the diverse disciplines that make up the practice of pharmacy.

Figure 1: Visualisation of the Salbutamol page, links to (light blue) and links from (dark blue).

Design:

The project centres around a list of topics drawn from material taught across the MPharm degree. Each student is allocated five unique topics. They then develop MediaWiki pages for each of their allocated topics. These pages should describe the topic in context with the other pages generated by their peers. This is achieved by creating links to these topics (Figure 1), the students then produce a concept map for assessment (Figure 2). The map should summarise the connections made throughout the MediaWiki to illustrate integration, both multi- and trans-disciplinary. The pages generated are peer reviewed and also submitted for assessment. For the 2018-19 cohort, the project was evaluated using a questionnaire.

Figure 2: Concept map

Figure 3: Questionnaire respondents (n=49)
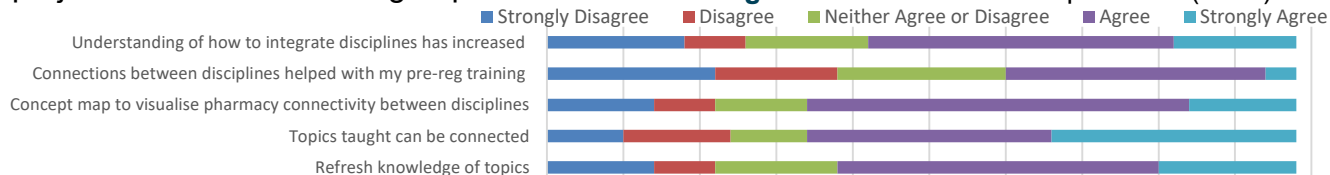
Results:

Questionnaire results (n=49, Figure 3) show that the majority of the respondents felt that both the MediaWiki pages/links and the concept map helped then better understand the connections between the varied disciplines that make up pharmacy. However due to the variability in quality of the MediaWiki pages, students felt that the MediaWiki was not a useful revision tool.

Conclusions:

The use of a MediaWiki and concept mapping can help students demonstrate that they have integrated the different disciplines from their MPharm programme.

DEVELOPMENT OF BACHELOR AND MASTER DEGREE PROGRAMMES IN GLOBAL HEALTH

John A Pieper, Stephanie Lukas, Brett Craig, Brenda L Gleason, Kenneth W Schafermeyer, Michael Sass, Heather Flabiano
St. Louis College of Pharmacy, St. Louis, Missouri USA

Objective

To identify and recommend potential new undergraduate and graduate programs at St. Louis College of Pharmacy

Design

A New Academic Program Evaluation Task Force was formed that followed a five-step process: 1) faculty-generated academic program ideas, 2) development of a curriculum shell, 3) market analysis, 4) financial projection based on tuition revenues and expenses, 5) submission of selected programs to President and Board of Trustees for approval.

Results

Bachelor and Master degree programs in Global Health were approved.

The Bachelor of Arts (BA) degree in Global Health consists of:

- 121 semester credit hours
- emphasizes the environmental, cultural, economic and political aspects of global health
- requires field work

The Master of Science (MSc) degree in Global Health consists of:

- 32 semester credit hours
- intended for individuals from a wide range of health disciplines and professions
- integrates health and social science perspectives within a global framework
- Instruction will be self-directed, formal and interactive lectures, seminars, tutorials, case studies and field research

An accelerated BA to MSc option is planned.

Conclusion

A collaborative faculty-led initiative, incorporating marketing and financial and curriculum design principles, identified new academic programs in Global Health. These degrees will be unique offerings within a college or school of pharmacy in the USA.
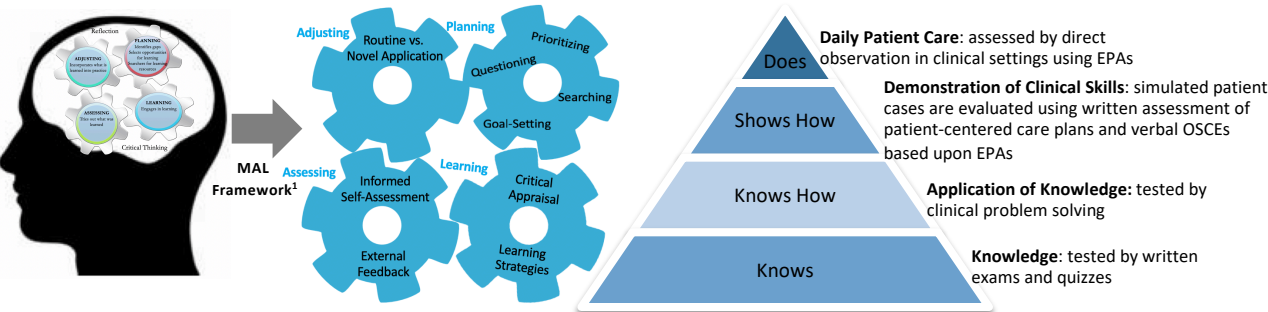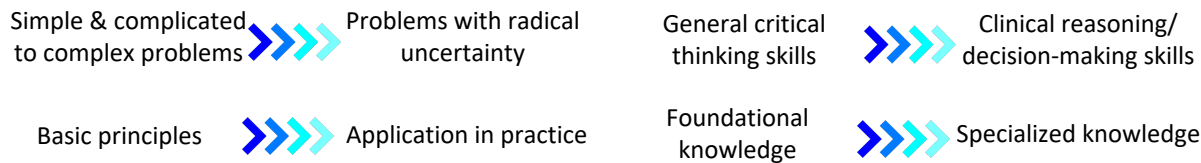
UTILIZATION OF MASTER ADAPTIVE LEARNER (MAL) FRAMEWORK FOR DEVELOPMENT OF AN INTEGRATED PHARMACOTHERAPY (iPHTH) COURSE SERIES

Denise H. Rhoney, PharmD; Sarah M. Anderson, PharmD; Kathryn A. Morbitzer, PharmD, MS; Amanda Corbett, PharmD
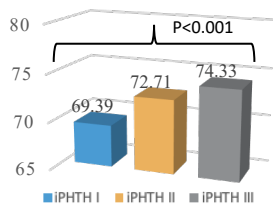UNC Eshelman School of Pharmacy, University of North Carolina, Chapel Hill, NC, USA

UNC ESHELMAN SCHOOL OF PHARMACY

DESIGN

MAL Framework[1]

Adjusting — Routine vs. Novel Application
Planning — Prioritizing, Questioning, Searching, Goal-Setting
Assessing — Informed Self-Assessment, External Feedback
Learning — Critical Appraisal, Learning Strategies

Pyramid:
- **Does** — **Daily Patient Care**: assessed by direct observation in clinical settings using EPAs
- **Shows How** — **Demonstration of Clinical Skills**: simulated patient cases are evaluated using written assessment of patient-centered care plans and verbal OSCEs based upon EPAs
- **Knows How** — **Application of Knowledge:** tested by clinical problem solving
- **Knows** — **Knowledge**: tested by written exams and quizzes

Objective of the iPHTH course series is to move students from…

- Simple & complicated to complex problems ⟶ Problems with radical uncertainty
- Basic principles ⟶ Application in practice
- General critical thinking skills ⟶ Clinical reasoning/decision-making skills
- Foundational knowledge ⟶ Specialized knowledge

Flow of Learning						Debrief 2 Learn
Learning Environment	Individual	Team	Full Class With Expert	Individual	Team	Full Class With Expert
Role of Student	Study new content area	Teams work to concept map new content area	Participate in class then identify & study areas of confusion	Evaluates released case and begins the PPCP process	Engages in PPCP with team to develop evidence based case deliverable	Participate in class then identify & study areas of confusion
Role of Instructor	Provide learning questions on new content area	Facilitators for teams	Content expert facilitates discussion with entire class	Content expert develops case in EHR Go	Facilitators for teams	Content expert debriefs case & challenges students with "what if" scenarios- grades written care plan or develops OSCE rubric
Possible Case Deliverable		Disease/Drug Concept Map				Quiz/Exam, PPCP written care plan, PPCP verbal care plan (OSCE)

Sequence of Learning	Therapeutic/Disease State Learning and Evaluation	Therapeutic Reasoning
		Therapeutic Decision Making

MAL Phase	Learning Phase	Assessing Phase	Adjusting Phase
	Planning Phase		

RESULTS

Knowledge Retention
P<0.001
- iPHTH I: 69.39
- iPHTH II: 72.71
- iPHTH III: 74.33

Knowledge Acquisition
Course Content Quizzes — iPHTH I: 86.8, iPHTH II: 86.5, iPHTH III: 83.4
Course Content Final Exam — iPHTH I: 81.6, iPHTH II: 86.2, iPHTH III: 90.6

Skill Development
Oral Communication — iPHTH I: 84.7, iPHTH II: 89.2, iPHTH III: 93.9
Written Communication — iPHTH I: 81.9, iPHTH II: 89.2, iPHTH III: 91.7
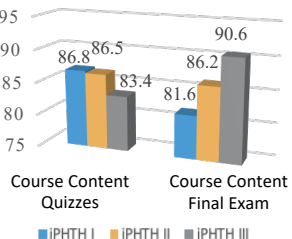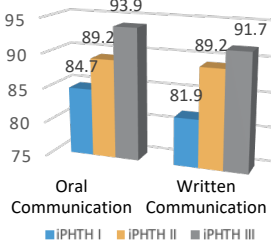
Case Grade Progression Across Each Course
(iPHTH I, iPHTH II, iPHTH III)
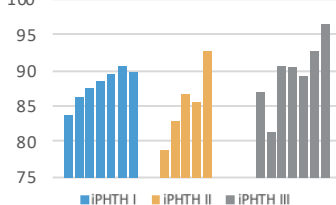
Reaction
- Feedback given, considered, and discussed
- Continuous quality improvement

Learning
- Student-directed learning resulted in knowledge gain at rates higher than reported in literature[2]

Behavior
- Progression through course increases performance expectations
- Students have steady increase for iPHTH I, drop beginning of iPHTH II, reflecting higher level of expectations

Results
- Experiential data shows consistent performance above expected EPA level while on early experiences and at expected level in iPHTH

CONCLUSION

- MAL provides students with tools to adapt in times of uncertainty
- The iPHTH course series using MAL is the most contemporary example of the belief that we can no longer focus on imparting information to students, but we must embrace developing a set of self-regulated, self-directed learning skills within our student pharmacist with the goal of developing expertise for life-long learning

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CURRICULAR TRANSFORMATION OF A PHARM.D. PROGRAM

Frank Romanelli, Pharm.D., MPH; University of Kentucky College of Pharmacy

UKCoP
Beyond the Script

Objective

To completely re-imagine and restructure an existing Pharm.D. curriculum.

Design

A multi-pronged approach was used to re-imagine, design, and execute a novel Pharm.D. curriculum. The transformation included changes to both delivery and content. Especially unique elements included a 6-semester community service learning program, a required course in diff dx, and a co-joined lab course sequence that does not sequester students by professional year. The transformation also included the adoption of 2 psychometrically sound high stakes assessments, one at the end of the 2nd second professional year and another at the end of the 3rd third professional year.

Results

6 semesters of the new curriculum have been instructed including a new experiential program. Initial MileMarker and PCOA data are available for analysis along with information provided by IPPE and APPE preceptors.

Conclusion

An innovative and ambitious curricular re-design was undertaken. Significant effort was involved in the execution of the original plan and design. Preliminary data indicate that the reformed curriculum is meeting objectives.

PY1				PY2			PY3			PY4
FALL	**SPRING**	IPPE I 3 = 3weeks Amb (PHR 928-001: Divine) / IPPE II 3 = 3 Weeks Inst (PHR 929-001: Divine)		**FALL**	**SPRING**	Mile Marker 1 (MM1)	**FALL**	**SPRING**	Mile Marker 2 (MM2) & PCOA	**FALL/SPRING**
Transitions in Pharmacy 1 (Oyler & Pauly)	IDD 1 (ID) 4 (PHR 926-001:Martin & Van Lanen)			IDD 2 (Neuro) 4 (PHR 936-001: Ryan & Bauer)	IDD 3 (Cardio) 6 (PHR 946-001: Loftin & McCauley)		IDD 4 (Psychiatry) 4 (PHR 956-001: Pauly & Johnson)	IDD 5 (Crit Care) 4 (PHR 966-001: Hatton-Kolpek & XXX)		Acute Care/Inpatient 6 (PPS 994-001: Miller)
Cells & Molecules 3 (PHR 911-001: Black)	IDD 1 (GI/Nutr) 2 (PHR 927-001: Leggas & Record)			IDD 2 (Rheum) 2 (PHR 937-001: Venditto & Kebodeaux)	IDD 3 (GU) 2 (PHR 947-001: Graf & Stevens)		IDD 4 (Oncology) 4 (PHR 957-001: Adams & Black)	PTx Applications in Special Pops 3 (PHR 967-001: XXX)		Advanced Hospital 6 (PPS 992-001: Miller)
Foundations in Pharm Science I 3 (PHR 912-001: Rohr)	Kinetics and Dynamics 4 (PHR 921-001:McNamara)			IDD 2 (Endocrine) 4 (PHR 938-001: Porter & Divine)	IDD 3 (Pulm) 3 (PHR 948-001: Kuhn & XXX)		Differential DX in Prim Care 2 (PHR 954-001: Ma Jones)	Operations & Fin Mgmt 3 (PHR 964-001: Cain)		Ambulatory Care 6 (PPS 993-001: McIntosh & Miller)
Wellness & Health Promotion I 3 (PHR 913-001: McIntosh)	Foundations in Pharm Science II 3 (PHR 922-001: Bae)			Policy, Outcomes & Public Health 3 (PHR 933-001: XXX)	Leadership in Pharmacy 3 (PHR 945-001: Burgess)		Scholarship I 3 (PHR 951-001: Tsodikov & Moga)	EBM 1 (PHR 965-001: Flannery)		Advanced Community 6 (PPS 991-001: McIntosh & Miller)
Clinical Reasoning 2 (PHR 914-001: Flannery)	Wellness & Health Promotion II 3 (PHR 923-001: Piascik)			Elective	Elective		Elective	Scholarship II 3 (PHR 961-001: Blumenschein & Garneau-Tsodikova)		Patient Care Elective 6 (PPS 995-001: Divine & Miller)
Pharmacy as a Profession 5 (PHR 915-001: Fink)								Elective		Non-Patient Care Elective 6 (PPS 996-001: Divine & Miller)
iCats (IPE Core Curr)	iCats (IPE Core Curr)									
PaCE 3 1 (PHR 910-001: Mi Jones)	PaCE 3 2 (PHR 920-001: Mi Jones)			PaCE 3 3 (PHR 930-001: Mi Jones)	PaCE 3 4 (PHR 940-001: Mi Jones)		PaCE 4 5 (PHR 950-001: Mi Jones)	PaCE 4 6 (PHR 960-001: Mi Jones)		

REFLECTION IN GLOBAL HEALTH USING PHOTOVOICE

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University of Kentucky College of Pharmacy, *University of Kentucky College of Nursing

UK College of Pharmacy | **Beyond** the Script

OBJECTIVE

The objective of this project is to critically engage students in an active medium to stimulate reflection and creatively inculcate principles related to global health at a formative time during training.

While on the medical brigade, I felt very inspired by the passion the Ecuadorians had for learning about healthcare. I was stationed as a fluoride provider and I had the opportunity to teach the children how to floss, brush their teeth, and have good oral health. For my picture . . .

photovoiceuky

DESIGN

- Undergraduate and graduate students from multiple colleges enrolled in a course that prepares them for an in-country global health experience
- Participants took photos to illustrate course topics: global health ethics; interprofessional practice; or social determinants of health. The iterative and participatory Photovoice process was used for students to analyze, discuss, and reflect on their work in-country and upon return. Final photos with captions were displayed online.
- Researchers analyzed photos and captions using content analysis to identify unifying themes.

FINDINGS

- 26 of 29 students (89.7%) consented to participate in the research portion of the assignment.
- Students chose the following topics for their photos: social determinants of health (n=17), interprofessional practice (n=3), ethics of global health (n=1), and five students did not specify their topic.
- The settings of the photos were overwhelmingly in an indigenous community (n=21), four participants chose to photograph in community centers where a temporary clinic was set up for the day, and one chose to photograph at a medical clinic. People were included as an element of the photo in 16 cases. Two overarching themes emerged: revelation and adaptation. Revelation encompassed novel elements that surprised the students, including differences and similarities between the US and Ecuador. Coded segments related to adaptation discussed participants' resourcefulness in challenging work environments, and how they will apply this new perspective to their future practices in the US.

CONCLUSIONS

This global health Photovoice project provided a unique medium for reflection for health care trainees. This project enhanced our understanding of the learners' perspectives and this new means of expression offered the learners a greater opportunity for depth of reflection. The assignment also revealed gaps in learning related to social determinants of health and areas of concern related to solidarity and privilege.

Preparing a Workforce for Care of Older Adults through Interprofessional Education

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University of North Carolina, Chapel Hill, NC, USA

UNC | ESHELMAN SCHOOL OF PHARMACY

OBJECTIVE

To describe the development and evaluation of an interprofessional education (IPE) pre-professional geriatrics (PPG) experience involving learners from ten different health discipline programs.

DESIGN

- The IPE PPG experience provided interdisciplinary health professional encounters using a collaborative approach towards caring for older adults held over two, three-hour sessions.
- Case studies in small groups with 10 health disciplines including **dentistry (DDS, DH), medicine (MD), nursing (DNP), occupational therapy (OT), pharmacy (Pharm), physical therapy (PT), public health (PH), social work (SW), and speech-language pathology (SLP)**

| 1. Priorities Case | 2. Puzzle Case | 3. Ethical Dilemma Case |

- Learners completed pre- and post-experience surveys framed from session objectives.
- Data from 2016, 2017, 2018 were analyzed.
- Supported by funds from HRSA, DHHS Carolina Geriatric Workforce Enhancement Program.

RESULTS

- Over the course of three years, 562 learners participated (DH-42; DDS-60; MD-39; DNP-43; OT-63; Pharm-60; PT-63; PH-61; SW-70; SLP-57).
- From surveys, significant increases in the following areas based on the IPE PPG Experience were noted for all discipline learners:

Table: Average Overall and Domains Pre- to Post-Intervention Change

Evaluation Measure	N	Baseline Mean (SE)	Follow-up Mean (SE)	Change in Mean (95% C.I.)	p-value
Confidence in functioning in interprofessional teams	562	6.34 (0.06)	8.29 (0.05)	1.95 (1.83-2.07)	<.0001
Knowledge of services provided by other disciplines	562	6.20 (0.06)	8.24 (0.04)	2.04 (1.93-2.16)	<.0001
Importance of other disciplines in providing health care to older adults	560	8.21 (0.06)	9.15 (0.04)	0.94 (0.85-1.02)	<.0001
Confidence in knowing when to refer to other disciplines	558	6.72 (0.06)	8.70 (0.04)	1.98 (1.87-2.08)	<.0001
Average[1] across domains	562	6.96 (0.04)	8.65 (0.04)	1.69 (1.61-1.76)	<.0001

1. Average of all answered questions; note some learners did not respond to one or more questions

CONCLUSION

This collaborative IPE PPG experience demonstrated learners gained skills to apply geriatric principles and critical thinking as IP team members. They demonstrated the ability to construct patient-centered care plans for older adults.

AN IMPLEMENTATION PLAN FOR INTERCULUTRAL LEARNING WITHIN A COLLEGE OF PHARMACY

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Purdue University, West Lafayette, Indiana

BACKGROUND:
Pre-professional and professional healthcare education focuses on building clinical and technical skills however, there is little time focused on building empathy and intercultural competence.

DESIGN:
- Faculty participated in training and certifications
- Activities and assessments were embedded into: orientation, professional labs, didactic courses, and co-curricular activities.
  - Topics covered included Hofstede's cultural dimensions, mindfulness, learning styles, and conflict management.
- A framework utilizing four core intercultural competencies was used to map activities across the four professional years.
  - increasing cultural and self-awareness
  - increasing awareness of others
  - learning to manage emotions and thoughts
  - learning to shift frames
- Each student completed an individualized debrief and intercultural development plan.
- Students completed a cultural competency badge from the Purdue University Center for Intercultural Learning, Mentorship, Assessment and Mentorship.

ASSESSMENT:
- Two cohorts of students have completed the Intercultural Development Inventory™ during the first professional year and will complete again during the final professional year.
- The assessments demonstrate that the majority of students begin in polarization or on the cusp of minimization (n=266; developmental orientation (DO): 87.32; perceived orientation (PO): 118.96).
- Additional scales to measure empathy (Chen/Kiersma Empathy Scale) and cultural intelligence (CQ™) were used to assess student growth following curriculum-embedded activities.

PURPOSE: The objective of this programming initiative was to provide intercultural education with a focus on empathy and healthcare for all students in a college of pharmacy.

Figure 1: Intercultural Development Inventory ™ (n=266)
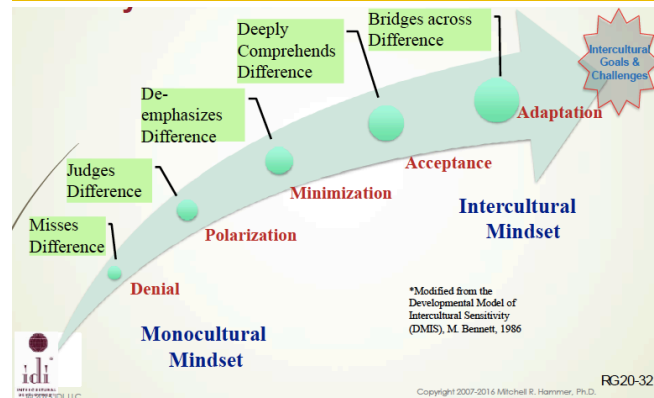
Developmental Orientation	Class of 2021 N= 115	Class of 2022 N=151
Denial	11	23
Polarization	41	48
Minimization	55	72
Acceptance	7	7
Adaptation	1	0

Figure 2: Example Intercultural Learning Curriculum Map

	Orientation	Practice Lab (PPL)	Non-PPL Courses (IPE, APE, & other required courses)	Experiential Education	Assessments
P1: Self-Awareness and Emotional Regulation Focus	- IDI™ - 30 minutes brief discussion	- ICL activities - Reflections - Emotional regulation activities	- Cultural Self-Awareness badge - APE: discussion on IDP		- IDI™ - Chen/Kerisma Empathy Scale - Intercultural Rubrics (badges)
P2 and P3 : Increasing Awareness of Others and Emotional Regulation Focus		- Intercultural Communication and Openness badges - Emotional regulation activities	- Cultural Dimensions assignment - Emotional regulation activities - Intercultural Curiosity and Worldview badges - APE: discuss IDP	- IDP during Community and Hospital Operations IPPE	- CQ™ - IDI™ - Intercultural Rubrics (badges)
P4: Bridging and Emotional Regulation Focus				- Intercultural Empathy Badge	- IDI™ - Empathy Scale Intercultural Rubrics - CQ™

CONCLUSION: By working with key College and University partners, a robust intercultural learning program has been longitudinally implemented that includes several individualized assessment measures.

THE GLOBAL HEALTH EXPERIENCE LEARNING PROGRESSION (GHELP) MODEL

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Purdue University, West Lafayette, IN, University of Colorado, Denver, CO, University of North Carolina, Chapel Hill, NC, University of Mississippi, Oxford, MS

BACKGROUND:

- Approximately two thirds of all US Schools and Colleges of Pharmacy offer an international Advanced Pharmacy Practice Experience (APPE).[1] Despite growing global education offerings, little is known about the learning outcomes gained from these experiences.
- The Consortium of Universities for Global Health (CUGH) developed an interprofessional global health competency framework that highlights "global citizen" competencies, basic abilities, knowledge and attitudes obtained by all health professionals training in global health.[2]

PURPOSE: Develop a model to contextualize global health learning for student pharmacists completing international APPEs.

DESIGN:

- Students from University of North Carolina at Chapel Hill, Purdue University, and the University of Colorado completed a retrospective pre-post survey evaluating self-perceived CUGH competency growth and answered open-ended questions about knowledge, skills, and attitudes after completion of an international APPE.
- Students were invited to participate in a focus group.
- Qualitative data from the survey and focus groups was coded in a two-cycle open coding process by investigators.
- Code mapping and analytic memo writing from the qualitative analysis were analyzed to derive to a model.

RESULTS:

- All 81 international APPE participants completed the open-ended survey items and 22 participated in the focus group discussions.
- The Global Health Experience Learning Progression (GHELP) model was derived to help explain the process of student learning while on global health experiences.
  - Progression model with three constructs
  - Triggers include cultural and patient care differences
  - Progress from cultural awareness → appreciation → sensitivity
  - Application to local practice

Figure 1: Global Health Experience Learning Progression (GHELP) Model
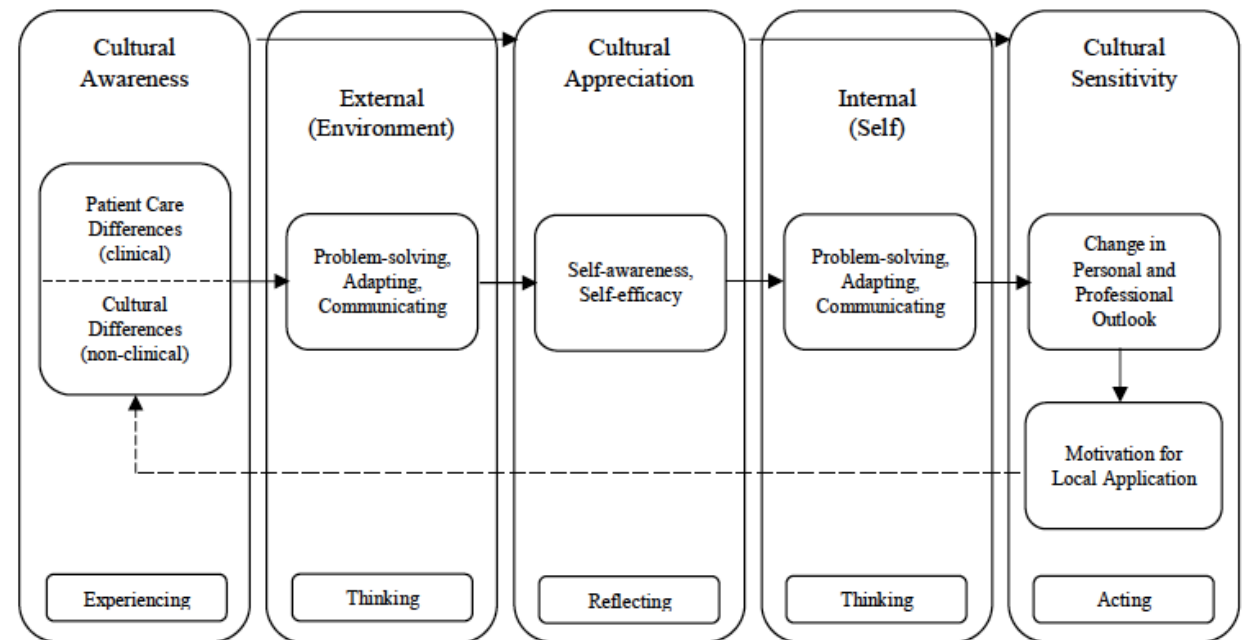
CONCLUSION: The Universities plan to utilize this model as part of pre-departure training to help student pharmacists better prepare for and conceptualize their global health experience. The GHELP model needs to be further validated to determine whether student learning progresses as outlined and whether students apply their learning back into a local context. Additional research is also necessary to determine if the model can be applied to trainees in other healthcare disciplines.

1. Am J Pharm Educ. 2016 Feb 25; 80(1): 7.
2. Ann Glob Health. 2015 Mar-Apr; 81(2):239-47.

EMBEDDING A WRITTEN COMMUNICATION SKILLS DIAGNOSTIC INTO THE CURRICULUM: ENHANCING STUDENT ACCESS TO SUPPORT SERVICES

Jennifer L Short[1], Ute Knoch[2], Annemiek Huisman[2], Tina Brock[1], Michelle McIntosh[1]   [1]Monash University, [2]University of Melbourne, Parkville, Australia

In the Faculty of Pharmacy and Pharmaceutical Science, written communication skills are addressed via coordination of a Faculty-wide, student-centred approach.
Objective: At enrolment, student communication skills vary with regards to English language proficiency (ELP), but the demands of an active learning environment and the requirement for graduates with advanced and nuanced communication skills has promoted the explicit addressing of English language communication skills within the curriculum.

A baseline measurement of written communication skills (Diagnostic English Language Assessment) is paired with underline knowledge (resources and support services) and skills (reflective practice; implementation of strategic plans).
Design: 1: All first year commencing students receive a detailed diagnosis of their written communication skills; 2: Students are trained in reflective practice and the use of support services in the development of strategic action plans; 3: Multiple opportunities for practice and assessment are provided to facilitate a cycle of improvement.

Deliberate scaffolding within curricula facilitates student participation in an on-going cycle of improvement, tailored to their individual developmental needs. Significant outcomes include a demonstrable increase in student engagement with learning support services around communication.
Results: Attendance at Peer Support increased after the embedding of DELA feedback alongside skills coaching. In 2018, 52% of attendees were domestic students. Library learning skills advisors also noted a spike in attendance at sessions designed to provide assistance with organisational structure, linking and the logical progression of arguments within a written piece of work.

Conclusion: Students are leaving a secondary school environment where relationships between the teacher and student are often established, and support mechanisms can be more easily identified and accessed. **For the first time in our faculty, every student gets detailed feedback on their baseline written communication skills, and uses that feedback to develop a strategic plan for improvement.**

Diagnostic English Language Assessment

In recent years, the internet has made pharmaceuticals more readily available to consumers. Below are some statements about the risks and benefits to consumers of online access to prescription drugs. Spend a few minutes reading and considering the statements. Then write an essay for your lecturer in response to the following question:

"Should consumers be able to purchase medicines online?"

You may use the ideas contained in the statements below, but DO NOT COPY phrases from them. You should also add ideas and examples of your own. You are expected to write at least 350 words and formulate a clear argument. You may use the space for notes for planning your essay.
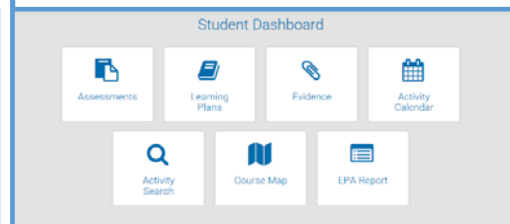
Statements for   Statements against

Example of diagnosis and feedback

FEEDBACK: At risk

| A. Ideas/Content	Yes	Inconsistent	No
Response clearly addresses the task	✓		
Writer's position is clear throughout		✓	
Sufficient main points are included	✓		
Main ideas are sufficiently developed and/or supported with examples		✓	
Reasoning is logical throughout	✓		
Response is concise (no repetition or irrelevant information included)		✓	

Reflections, associated evidence, and actions for improvement are recorded in an in-house ePortolio system.

Student Dashboard

Assessments   Learning Plans   Evidence   Activity Calendar

Activity Search   Course Map   EPA Report

Students use Borton's model of reflection (What? So What? Now What?). Skills coaches provide feedback using the KEEP, START, STOP format. The student then enters their agreed actions.

What? - In the DELA test, I tried my best to produce a piece under stressful circumstances, and I only got a BORDER LINE ranking. So What? - on the feedback form, it indicated that my response was not concise throughout, with some repetition and irrelevant information included. Also I need to improve on clarity of the sentences I write as well as on how to produce an effective yet concise conclusion. Furthermore I will have to work on controlling complex sentences and use of a wider range of vocabulary. now what ? - Since I'm not a

Hi Thomas, KEEP reflecting honestly, and discussing your response to feedback that indicates skill areas that may need attention. This is a good start, but I would like to see more information under each of the headings, for example, more context for the DELA - what it was, what did it test? Under So What? you could discuss the need for these specific aspects of written communication to be improved - why are they necessary, and why is this important for you as a student/future pharmaceutical

I will continue to practice oral communication skills and start working on written skills. I will start to read newsletters for 15 minutes everyday and highlight some new vocabularies or phrases that I'm not familiar with. I will also access English Connect resources when I am free.

Attendance at Peer Support, an extracurricular program in which linguistics experts review the grammatical structure of a piece of written work.
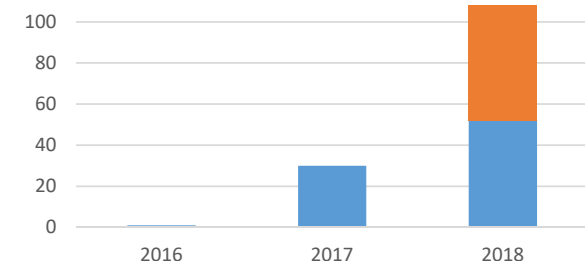
CUSTOMIZED LEARNING PLATFORM ENABLES ACTIVE, FORMATIVE LEARNING IN LARGE CLASSROOMS: STUDENTS' PERCEPTIONS OF ONLINE ASSESSMENT IMPACT USING THEIR OWN DEVICES

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UNIVERSITY OF TORONTO
LESLIE DAN FACULTY OF PHARMACY

Objective

The prevalence of personal mobile devices provides an opportunity for formative learning. Students' attitudes to a new environment for comprehensive digital pedagogy to enable teaching in large size classrooms were examined.

Design

In 2018 the University of Toronto launched a new web-based learning platform (Quercus) to enhance teaching and foster interactivity with students. A study was conducted in two therapeutics courses of 242 and 154 pharmacy students to evaluate effectiveness of educating via digital pedagogy using students' live access to personal devices. Random polling tests were conducted throughout each session to test formative understanding and give feedback. 100% of responses were recorded. Perceptions were elicited from web-based surveys, interviews, focus groups and observations for each cohort.

Results

Both cohorts reported Quercus provides a safe, anonymous space for active, participation; stimulating concentration throughout long sessions. It facilitated key concept clarification through instant feedback. No major hurdles were encountered. Speed of access varied with locations.

Conclusion

Positive perceptions focused on the facilitative pedagogy (learning enhancements, reinforcement/feedback) and practical features (enjoyable, engaged and autonomous participation). Learning dynamics in large size classes became more active and retention was solidified. Students endorsed this all-inclusive learning space as effective and recommended its use for online polling. It lacks cost or participant restrictions of commercial digital or hand-held responses systems.

Themes:
- Active engagement
- Anonymity (safe)
- Reinforcement of conceptual understanding
- Transition to self-regulation (practice)
- Facilitated learning after class
- Instant formative feedback
- Change learning habits in large classroom
- Increased retention

An Advance Pharmacy Practice Experience (APPE) for a Pharmacist E-Consultation Service with Primary Care Providers

Marie Smith, PharmD, FNAP and Erika Vuernick, PharmD

UCONN SCHOOL OF PHARMACY

INTRODUCTION

To develop an APPE with an innovative, technology-enabled, virtual team pharmacy practice model with primary care providers (PCPs). We designed an *APPE rotation for PharmD student involvement to collaborate with PCPs who do not have access to a clinical pharmacist.* Most non-academic PCPs do not have access to a pharmacist in their practices. For the past 3 years, PCPs have used e-consultations to send questions to medical colleagues (e.g., cardiologists, dermatologists) when they have a complex case or need a second opinion on treatment options. Our *service positions clinical pharmacists as the pharmacotherapy specialist available to PCPs*. PCPs use secure electronic technology to send a pharmacist a patient-specific pharmacotherapy question.

METHODS / APPROACH

PCPs send an e-consultation that includes the medication-related *question, pertinent patient health information and lab results, and current patient medication list.* The APPE students reviewed the e-consultation question and pertinent patient info, assessed the current med list, and wrote an actionable recommendations to PCPs for review by the fellow, and the *e-consult note was sent to the PCP within 48 hours of receiving an e-consult question*. This demonstrates a pharmacy practice transformation opportunity where pharmacists are a virtual health team member with primary care practices.
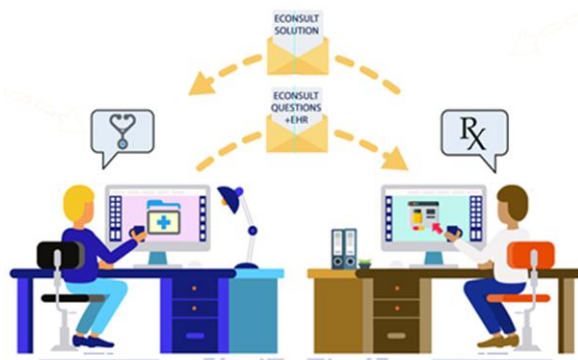
E-CONSULT QUESTION and NOTE

E-consult Info

- 64 year old male
- Medicare insurance coverage
- PMH: HTN, HL, AUD, smoker, GERD, degenerative disc disease, T2DM, chronic pain, obesity
- Medications:

Metformin 1000mg PO BID	HCTZ 25mg PO QD
Glimepiride 4mg PO BID	Amlodipine 10mg PO QD
Oxycodone/APA 10/325mg 1–2 tabs PO q6hrs PRN	IBU 600mg PO q8hrs PRN
Metoprolol succinate 25mg PO QD	Rosuvastatin 20mg PO QHS
Albuterol HFA 90mcg/inh 2 puffs PO 4x/day PRN	Aspirin 81mg PO QD
Benztropine 1mg PO BID (if shaking)	Pantoprazole 20mg PO QD

- Vitals: Temp 99.1F, Ht 66.5 in, Wt 250.2 lbs, BMI 39.7, BP 127/74, HR 80, RR 18, current smoker (5/day x 48 years), pain scale 8, O2 sat 95%
- Current A1c: 9.3%
- Current CrCL: 109 mL/min
- No hx of ASCVD or CHF

Provider Question:

I am working with a 64 yo male with uncontrolled diabetes. The patient does not want to start insulin. What other oral agents would you suggest?

Pharmacist Assessment

- **Oral SGLT-2 inhibitors** with proven CV benefit + known to help improve weight loss
- Options (consider based on Medicare insurance plan variations):
  - Empagliflozin (Jardiance) (#1 choice)
    10mg PO QD, may increase to 25mg if needed
  - Dapagliflozin (Faxiga)
    5mg PO QD, may increase to 10mg if needed
  - Canagliflozin (Invokana)
    100mg QD (prior to first meal), may increase to 300mg if needed
- AEs include GU infection, Fournier's gangrene, dehydration/volume depletion, renal failure, hypotension, hyperkalemia, increased LDLs and hypoglycemia in conjunction with sulfonylureas or insulin. If selecting a SGLT-2 inhibitor, counsel pts on s/s of hypoglycemia and Rule of 15s for treatment of hypoglycemia.

Pharmacist Recommendations

1. Recommend a SGLT-2 inhibitor for cardio-protective/weight-loss

2. If selecting a SGLT-2 inhibitor: Empagliflozin (Jardiance) – see assessment for dose & AEs.

3. Counsel patient on risk of hypoglycemia.

RESULTS and CONCLUSIONS

Students learned to: (1) assess data in an e-consultation format; (2) write concise and actionable notes for treatment recommendations; and (3) document clinical pharmacist assessments, recommendations, and time involved to propose reimbursement for pharmacist e-consultation services.

Pharmacist e-consultations are a practical method of introducing clinical pharmacist expertise to PCPs in non-academic settings. Healthcare technology enables the integration of clinical pharmacist expertise as a virtual team member to address complex medication-related questions from PCPs.

EXPLORING THE INTERACTIONS OF HOSPITAL PHARMACISTS WITH OTHER HEALTH CARE PROFESSIONALS TO INFORM INTERPROFESSIONAL EDUCATION

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Cardiff School of Pharmacy & Pharmaceutical Sciences

Introduction

Interprofessional teamwork, when effective, supports the delivery of quality outcomes for patients. Hospitals provide a unique opportunity for interprofessional teamwork given the range of healthcare practitioners (HCPs) that work in the setting. Nevertheless, a number of reports have indicated that interprofessional teamwork is sometimes suboptimal. Interprofessional education (IPE), embedded in UK Master of Pharmacy programmes, is an effective tool to prevent professional siloing (Parsell and Bligh 1998). Our objective was to understand interactions between hospital pharmacists and other healthcare practitioners in order to develop effective undergraduate IPE.

Aim & Method

The aim of this current work was to understand the interprofessional interactions that take place between hospital pharmacists and other HCPs. Purposive, snowball sampling was used to recruit hospital pharmacists. Semi-structured interviews were conducted with participants. Inductive thematic analysis was used to develop themes from the data. Deductive, conceptual, content analysis was used to identify the frequency of interactions, the mechanisms by which they took place (e.g. face-to-face, telephone etc) and the reason for engaging in the interaction.

Results

15 Hospital based pharmacists were interviewed in total – nine participants reported that their **most frequent interprofessional interaction** were with **doctors** whilst the remaining six indicated their most frequent interactions were with **nurses**. Physiotherapists and dieticians were also reported as healthcare professionals with which pharmacists had frequent interprofessional interactions.

The mechanism of interaction with healthcare professionals was largely reported to be via **face-to-face conversations** or by the **telephone** although some participants indicated that written notes were appropriate in some circumstances.

Inductive results inductive thematic analysis revealed 4 main themes as well as multiple subthemes within each of these.

The four main themes are shown below:

1. Perceived benefits of interprofessional interactions
2. Perceived barriers to interprofessional interactions
3. Perceived facilitators to interprofessional interactions
4. Impact of doctors' seniority on interactions

Deductive results The table below indicates the nature of the queries (clinical & practical) that interviewees discussed with other select HCPs in the course of their practice.

Healthcare Professional	Clinical queries (top 3 shown)	Practical queries (top 3 shown)
Hospital Doctor (n=15)	Medication appropriateness (n=7) Dose appropriateness (n=7) Patient discharge (n=7)	Medication stock / supply (n=3) Clinical Governance (n=3)
Hospital Nurse (n=15)	Medication administration (n=15) Patient information (n=12) Medication information & advice (n=5)	Patient discharge (n=9) Medication stock / supply (n=7) Arranging bloods to be done (n=6)
Dietician (n=15)	Total Parenteral Nutrition (n=13) Mineral / Electrolytes (n=6) Tailoring diet / medicine (n=5)	NG/PEG tubes (n=6) Dietary medication stock / supply (n=3) Passing info to doctor (n=1)
General Practitioner (GP) (n=14)	Medicines reconciliation (n=6) Relaying information on discharge (n=4) Medicines information queries (n=3)	Administrative role between GP and HCP (n=1)

Discussion

This study has highlighted the HCPs that hospital pharmacists predominantly interact with and the nature of those interactions. This information can be used to design meaningful IPE for pharmacy students with the most appropriate colleagues that is based on authentic scenarios.

1. Parsell, G. & Bligh, J. 1998. Interprofessional learning. *Postgraduate Medical Journal* 74(868), pp. 89-95.

Understanding professionalism and the tenets of a pharmacy professional

Pamela Timanson[1,2], Greg Eberhart[1], and Kaye Moran[1]
[1]Alberta College of Pharmacy, Edmonton, Canada
[2]University of Alberta, Edmonton, Canada

Objective: To develop a framework that will provide clarity and definition to our understandings of professionalism and what it means to be a pharmacy professional.

Method: A qualitative research approach (Merriam, 2009) was utilized to construct an understanding of professionalism and what it means to be a pharmacy professional. Data were collected using a variety of methods including focus group, small group discussions, popular culture artefacts, meetings with internal and external stakeholders, a survey, word clouds, and research notes. A comparative analysis technique (Merriam, 2009) was used to code and categorize data. Categories arose from the analysis of coded data and literature review. Member checking was used to refine the categories.

Results: Three categories constructed professionalism: values, profession, and individual. The values category had the largest presence, in terms of the number of descriptors provided for pharmacy professionals. The data in the three categories were sub-categorized into six tenets: person-centered, use good judgement, collaborator, leader, values, and active learner. A definition of professionalism was constructed through the categorization process.

Conclusion: This research approach produced a framework constructed from the various understandings and experiences of our stakeholders as to what professionalism is, what it means to be a pharmacy professional, and the characteristics of a pharmacy professional. For pharmacy professionals, professionalism is demonstrated by those who have a profound sense of altruism and ethical conduct to promote the health of individuals and their communities across the continuum of care. This leads to members of the public and colleagues having confidence, respect, and trust in what they do and feeling genuinely cared for. An engaged pharmacy professional is one who embraces the full scope of their practice and, through the establishment of meaningful, professional relationships with their patients and colleagues, emanates the tenets of having a person-centered approach to their professional service, uses good judgement, collaborates, leads, has a strong set of values, and is an active learner.

LEADERSHIP 101 for INTERN PHARMACISTS

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2. School of Pharmacy, University of Queensland, Brisbane, Queensland, Australia.

Background

Leadership and management competencies are now included in scope of practice for all pharmacists at entry to the profession.[1]

Objective

To investigate intern pharmacist knowledge of leadership principles and to report on a workshop undertaken to assist intern pharmacists explore leadership principles.

Method

A 90 minute interactive workshop was designed covering:
- leadership and management principles
- leadership styles
- reflection of personal leadership styles
- application of the advanced performance criteria for management and leadership[1]

Interns completed a pre and post workshop survey to determine knowledge of leadership principles. A workshop evaluation was also completed. Basic descriptive statistics of frequency and percentage were calculated for each question. Ethics approval was granted.

Results

- Seventy-four intern pharmacists participated in the workshop in 2018
- Trend for intern pharmacists to demonstrate improved leadership knowledge at the conclusion of the workshop

Intern Knowledge	Pre workshop	Post workshop
Rostering identified as a management task	69%	96%*
Transformational style of leadership identified as allowing for other people to have greatest influence	40%	54%
Followship identified as increasingly associated with leadership today	25%	56%
Vision for the future best differentiates how a leader rather than a manager influences teams	22%	68%

* McNemar's test p=0.001

Intern workshop evaluation

88% intern pharmacists agreed: It is relevant to incorporate leadership training in the intern year

97% intern pharmacists agreed: Interns could learn leadership principles

86% intern pharmacists disagreed: Leadership training should be reserved for more senior pharmacists

The most important aspect of the workshop that I found relevant:

"Showing that leadership is not just reserved for people in positions of leadership, everybody can drive change"

"Describing the difference between leadership and management and relating them to the intern year"

Conclusion

Intern pharmacists responded positively to a leadership workshop. Their knowledge of leadership principles improved. This workshop will become an annual event.

MONASH
PHARMACY & PHARMACEUTICAL SCIENCES

1.Pharmaceutical Society of Australia. National Competency Standards Framework for Pharmacists in Australia 2016 [Internet] [cited 2019 May 1] Available from https://www.psa.org.au/practice-support-industry/national-competency-standards/

MONASH University

SCAFFOLDING TO ENHANCE INQUIRY SKILLS IN PHARMACY STUDENTS, INTERN PHARMACISTS AND PHARMACISTS

Michelle Vienet, Kirstie Galbraith, Dan Malone, Ian Larson, Tina Brock.
Faculty of Pharmacy and Pharmaceutical Sciences, Monash University, Parkville, Victoria, Australia

Background
- Inquiry skills have been identified as a gap in pharmacy graduate competencies.[1]

Objective
- To scaffold the development of inquiry skills in undergraduate and postgraduate pharmacy education and training.
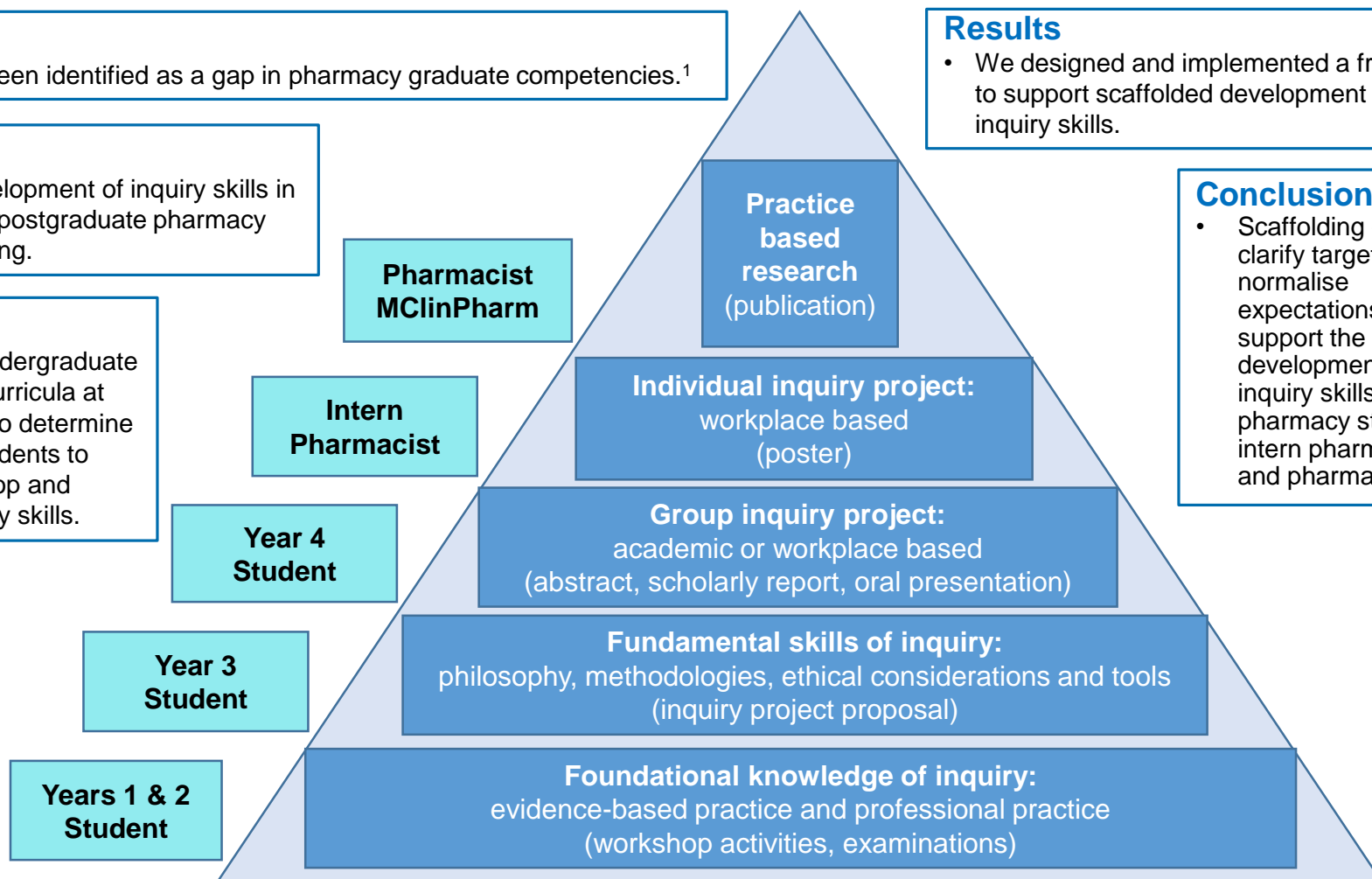
Methods
- We reviewed the undergraduate and postgraduate curricula at Monash University to determine opportunities for students to progressively develop and enhance their inquiry skills.

Results
- We designed and implemented a framework to support scaffolded development of inquiry skills.

Conclusions
- Scaffolding can clarify targets, normalise expectations and support the development of inquiry skills for pharmacy students, intern pharmacists, and pharmacists.

Pharmacist MClinPharm

Intern Pharmacist

Year 4 Student

Year 3 Student

Years 1 & 2 Student

Practice based research (publication)

Individual inquiry project: workplace based (poster)

Group inquiry project: academic or workplace based (abstract, scholarly report, oral presentation)

Fundamental skills of inquiry: philosophy, methodologies, ethical considerations and tools (inquiry project proposal)

Foundational knowledge of inquiry: evidence-based practice and professional practice (workshop activities, examinations)

MONASH
PHARMACY &
PHARMACEUTICAL
SCIENCES

1. Vienet M, Brock T, Galbraith K, Malone D, Identifying gaps in intern competencies to inform scaffolding for pharmacy students. Bridging from undergraduate to postgraduate. Pharmacy Education, 2018:18(1);31

MONASH University

COLLABORATING ACROSS STATE BORDERS: AN INTERPROFESSIONAL CURRICULUM CENTERED AROUND TELEMEDICINE PRINCIPLES

Deepti Vyas PharmD
University of the Pacific (UOP), Thomas J Long School of Pharmacy and Health Sciences

Objective: To describe a telemedicine curriculum designed to provide collaborative interprofessional education (IPE).

Design: 200+ students are enrolled/class year at the pharmacy school. IPE challenges include missing health professions and distances between campuses.

An alternate IPE model was needed to fulfill our IPE needs, leading to the development of a telemedicine curriculum.

Telemedicine refers to the use of telecommunications technology to deliver patient care.

The **goals** of the telemedicine program were for students to: 1.) Improve professional communication, 2.) Collaborate with other health professionals, and 3.) Develop a broader perspective of healthcare.

For the first IPE, 5 cases were developed with a focus on psychiatric illnesses. **Participants**: UOP pharmacy and University of Missouri-Kansas City, Nurse Practitioner students.

The second IPE focused on an inpatient liver cirrhosis case. **Participants**: UOP pharmacy and West Virginia School of Osteopathic Medicine students.

Modalities used:

- Patient charts on EHR Go®, an educational electronic health record
- YouTube video simulating a physical assessment with a focus on the physical manifestations of disease
- WebEx/Skype
- Google docs/phone

Requirements: Two videoconferences per simulation were required. The first conference focused on differential diagnosis and assessment of the patient. The second videoconference focused on using the SBAR (situation, background, assessment, and recommendation) tool.

Students then wrote-up a SOAP (subjective, objective, assessment, and plan) note, completed: a pre/post SPICE survey (validated), peer assessment of team members, and an attitudes survey.

Results: 630 students participated in this telemedicine curriculum. Students reported significant improvements on all SPICE survey questions. 94% felt that the IPE was useful to their learning. Data from the peer assessment generally showed positive attitudes towards team member contribution. The attitudes survey are displayed in the figure.

Student Attitudes towards Telehealth

Conclusion: This IPE leveraged technology to provide meaningful telemedicine experiences. Students from different US states were able to interface and work collaboratively to provide care for a patient. This model provided a broader nationwide perspective to healthcare and allowed interaction with students from diverse health professions.
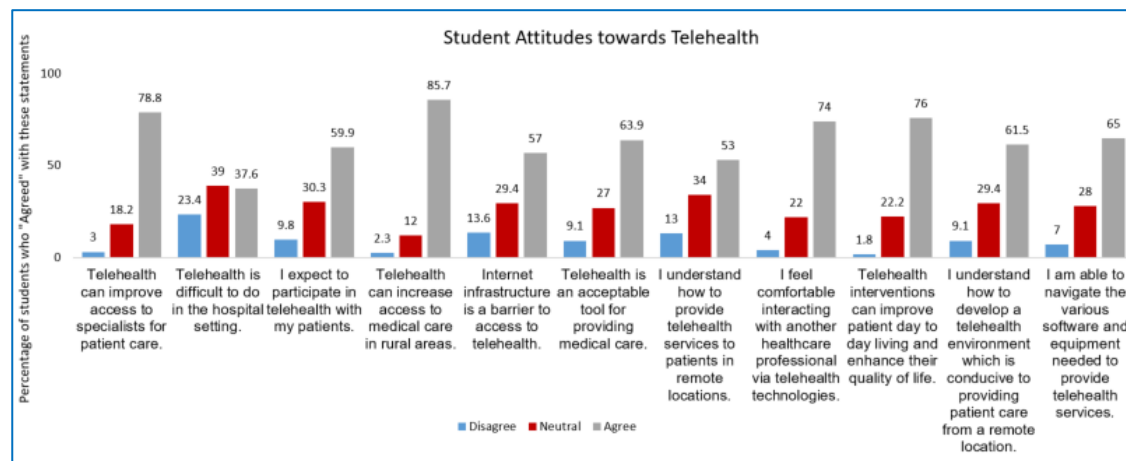
YEAR 1 MPharm INDUCTION: UNDERSTANDING MEDICINES ADHERENCE FROM THE PATIENTS' PERSPECTIVE

Cate Whittlesea, Maaya Modha, Rob Horne, Krupa Depala, Peter Field, University College London, Nilesh Patel, Reading University

Objective: For year 1 MPharm students to experience medicines adherence by taking a placebo for 5 days, reflecting on this experience, completing a formulary entry, identifying their own beliefs about medicines and to discuss adherence with a friend/relative and patients who regularly take prescribed medicines.

Design: The induction activity introduced adherence, provided guidance/support/resources for undertaking reflection and completing a formulary entry (ibuprofen, simvastatin, metformin), and determination of the student's beliefs about and perceived sensitivity to medicines. The evaluation assessed students' engagement with the 5 day induction activity and performance through submission of a reflective account, using Gibb's (1988) model assessed using the REFLECT tool (Wald et al 2012) and a formulary entry. A questionnaire evaluated student experience.

Results: Of the 183 MPharm Y1 students, 174 (95%) participated in the activity, with 173 (95%) submitting a reflective account and 179 (98%) a formulary entry for formative review. Most students identified in their reflection that medicine taking was more challenging than expected. Some compared their experience with their friend/relative but only a few compared their experience to the patients with HIV. No students linked their adherence to their beliefs about medicines. Identification of national guidance was not as well completed as other formulary sections. Many students required referencing support. The post-activity questionnaire was completed by 73 (40%) students with 90% (64/71) recommending the activity. Students definitely or mostly agreed that the activity allowed them to 'explore adherence from the patient perspective' (68/72), 'challenged and stimulated their views' (59/72) and provided an 'opportunity to appreciate the pharmacist's role in supporting patient adherence' (64/70).

Conclusion: The induction activity enabled students to understand the complexity of medicines adherence and the pharmacist's role.

Evaluation of a novel Clinical Learning in Practice (CLIP) model in UK Teaching Hospitals for Undergraduate Pharmacy students

Wigg DN, Young N, Hanning LN, Wareing T, Goddard D & Cooper G
Department of Pharmacy and Pharmacology, University of Bath, Bath, BA2 7AY, UK
Presenting Author: Danielle Wigg

Background & Objectives

The University of Bath MPharm programme was redesigned with the aim to produce pharmacists with increased clinical competence. Practice Educator posts were created to bridge the gap between academic study and professional practice, with the responsibility for designing, developing and implementing CLIP (Clinical Learning in Practice) in four teaching hospitals in the United Kingdom. Key to CLIP design was the use of Miller's Pyramid of Clinical Competence (1990) and professional GPhC Graduate Outcomes (2011) to design learning which moves from *"knows"* to *"shows how"*.

Study Design

As part of the evaluation process, a specifically designed self-administered evaluation tool was applied, to determine if self-reported confidence had grown in key areas. Two time points were examined: prior to the first CLIP session and on completion of the first CLIP year (2017/18).

Results

87% of students (n=63) were <20 years of age with 63% of students being female. The evaluation tool demonstrated a good level of internal consistency, with strong evidence that CLIP significantly improves confidence across all GPhC Graduate Outcome themes (2011) (n=63; $p<0.05$) **(See Fig 1)**.
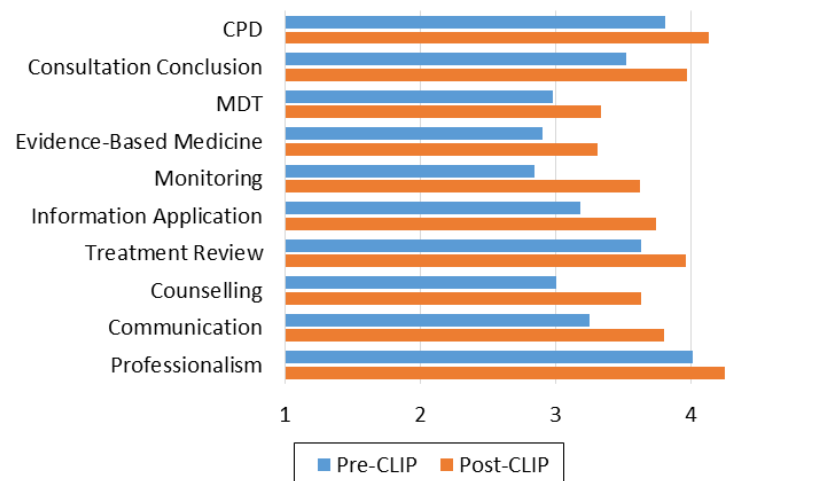

Fig 1: Mean Confidence across all GPhC Graduate Outcome Themes (2011) Pre & Post First CLIP year

Conclusion

The inclusion of CLIP within the curriculum demonstrates a statistically significant improvement in students' confidence in a clinical environment and their progression towards GPhC Graduate Outcomes. The developed programme meets a number of FIP Workforce Development Goals including the use of competency frameworks to support the translation of pharmaceutical science into professional practice.

References: General Pharmaceutical Council (GPhC) (2011). Future Pharmacists: Standards for the Initial Training and Education of Pharmacists. London: General Pharmaceutical Council; Miller, G.E (1990). The assessment of clinical skills/performance. *Academic Medicine* (Suppl.); 65: S63-S7.

ASSESSORS' PERSPECTIVES ON INTERPRETATION OF AGGREGATED NARRATIVE ASSESSMENT DATA

Kyle John Wilby, School of Pharmacy, University of Otago, Dunedin, New Zealand*
Diana Dolmans, School of Health Professions Education, Maastricht University, Maastricht, Netherlands
Zubin Austin, Leslie Dan Faculty of Pharmacy, University of Toronto, Toronto, Canada
Marjan Govaerts, School of Health Professions Education, Maastricht University, Maastricht, Netherlands
*Study conducted at the College of Pharmacy, Qatar University, Doha, Qatar

Objective

To explore how assessors process and bring meaning to narrative data written by others about student communication skills in OSCEs

Methods

1. OSCE
Writing Narrative Comments

2. Think Aloud
10 expert assessors review aggregated data

3. Between Case Analysis
Thematic analysis using each assessor as a case

Background

Increasing calls for the use of narrative data in assessment to substantiate judgments
Despite evidence of credibility, narrative data written by others is challenging to interpret

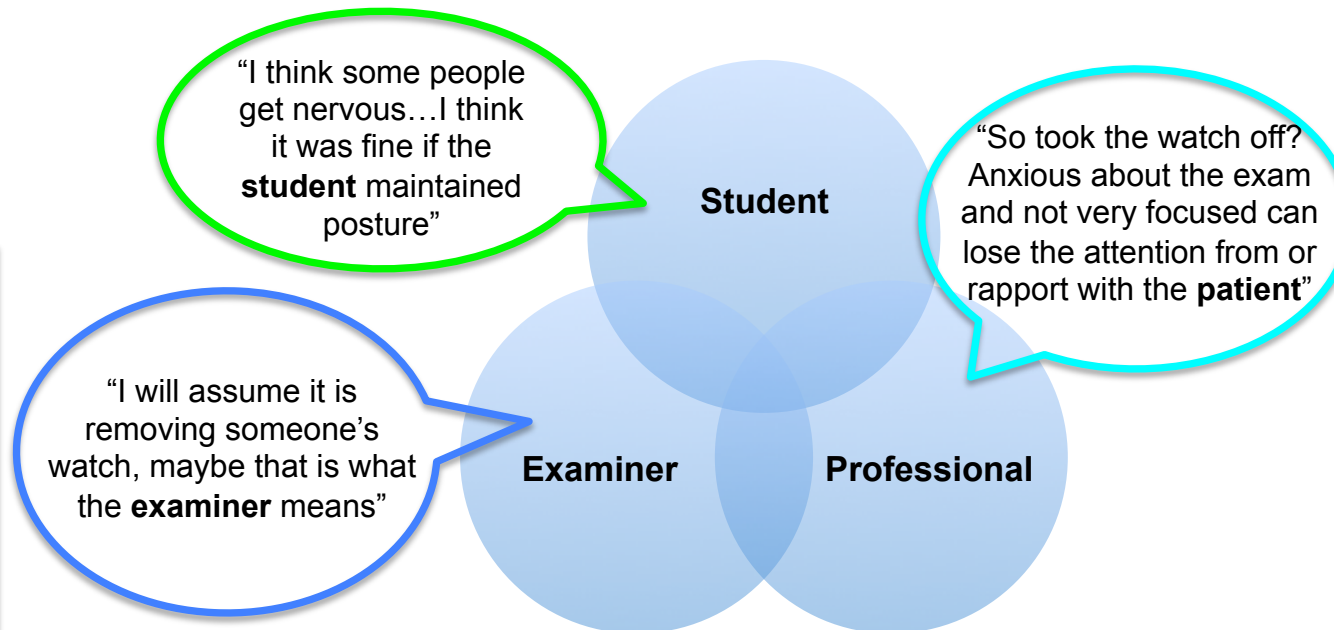**Fig 1**. *Perspectives In Response to: "Took watch off in middle of interaction"*

Results

Assessors bring 3 perspectives to the data:
1. Student
2. Examiner
3. Professional

Assessors place themselves 'in the shoes' of their dominant perspective when interpreting comments

Conclusion

Assessors' perspectives may be a source of variability in interpretation of performance data

KJ_Otago

HEALTH PROMOTION IN HIGH SCHOOLS: STUDENT REFLECTIONS ON A CORE CURRICULUM ACTIVITY

Sarah C. Willis, Emma Williams, David G. Allison, The University of Manchester, UK

Objective: Peer education effective in health promotion (World Health Organisation, 2006; Lockspeiser et al, 2008; Singh, 2010); benefits for educators include developing leadership skills and social responsibility (Badura et al, 2000).

We report here perceived impact on y3 students of being a peer educator.

Design: Y3 MPharm students delivered a workshop to high school children (aged 14-16) on either antibiotic resistance, alcohol, diabetes, mental health or sexual health awareness.

Reflections captured in CPD record

Results: Students reflected on impact on team working, presentation, communication and engagement skills, application of learning, and importance of sharing knowledge

> "We had been able to raise mental health awareness among young adults. It was really good to be in the position of delivering the information…I am sure this is an important role in my future career as a pharmacist"

> "A good opportunity to adapt my language and approach to a younger audience…not [had] the opportunity for this at university but will have to in practice".

Conclusion: Being a peer educator helps students practice future health promotion role, and develops communication skills

Badura AS, Millard M, Peluso EA, Ortman N. (2000) Effects of peer education training on peer educators: Leadership, self-esteem, health knowledge, and health behaviors. Journal of College Student Development. 41(5):471.
Singh S. (2010). Near-peer role modelling: The fledgling scholars education paradigm. Anatomical Sciences Education, 3(1), pp.50-51.
World Health Organization (WHO), 2006 . What is the evidence on school health promotion in improving health or preventing disease and, specifically, what is the effectiveness of the health promoting schools approach? What is the evidence on school health promotion in improving health or preventing disease and, specifically, what is the effectiveness of the health promoting schools approach?

ESCAPE THE NORM: ESCAPE ROOMS FOR LEARNER ENGAGEMENT AND COLLABORATION

Michael D. Wolcott[1,2], Nikki G. Lobczowski[3], Amanda Olsen[1], Heidi N. Anksorus[1]

[1]University of North Carolina Eshelman School of Pharmacy; [2]UNC Adams School of Dentistry, [3]UNC School of Education, Chapel Hill, United States of America

Study Objective

To pilot an escape room and identify design principles that can be used to promote learner engagement and collaboration in novel learning environments

Design

- Escape room created using **design thinking** (a user-centered approach)
- Third-year students **piloted the prototype** escape room (Figure 1)
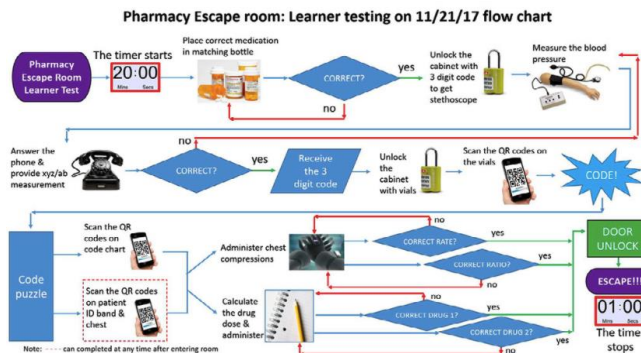- Participants were **interviewed and observed** to inform future designs

Figure 1. Escape room flow diagram

Results

Overall, learners…
- had fun
- were supportive of implementing it as a formative assessment
- wanted a more formal approach to feedback about collaboration

Theme 1: Interactive elements spark engagement

"I think this is great. It's interactive. We do it (interact) on the rounds, but not enough. This helps me with my learning."

Theme 2: Can induce participant collaboration

"We caught each other's mistakes. At first, I trusted everyone's calculations, but then I started checking."

Theme 3: Could help assess clinical knowledge

"I think this would be helpful to figure out what I need to re-learn before the 4th year."

Figure 2. Escape room participants

Conclusion

- Full impact has yet to be realized—initial findings are promising to promote engagement and collaboration
- Next steps include large scale testing

WHAT WERE YOU THINKING? STUDENT AND PHARMACIST SITUATIONAL JUDGMENTS ABOUT EMPATHY

Michael D. Wolcott[1,2], Nikki G. Lobczowski[3], Jacqueline M. Zeeman[1], Jacqueline E. McLaughlin[1]

[1]University of North Carolina Eshelman School of Pharmacy; [2]UNC Adams School of Dentistry, [3]UNC School of Education, Chapel Hill, United States of America

Study Objective

To describe the features of the response process (i.e., what participants think about) when completing a situational judgment test (SJT) intended to measure empathy

Design

- **Thirty participants** (15 students, 15 pharmacists) completed a **12-item SJT** designed to measure **empathy**

- Each item had a case scenario and participants **ranked five responses** in order of appropriateness

- Participants completed a t**hink-aloud interview** of all 12 items followed by a **cognitive interview**

- Interviews were coded to identify salient themes and create a model
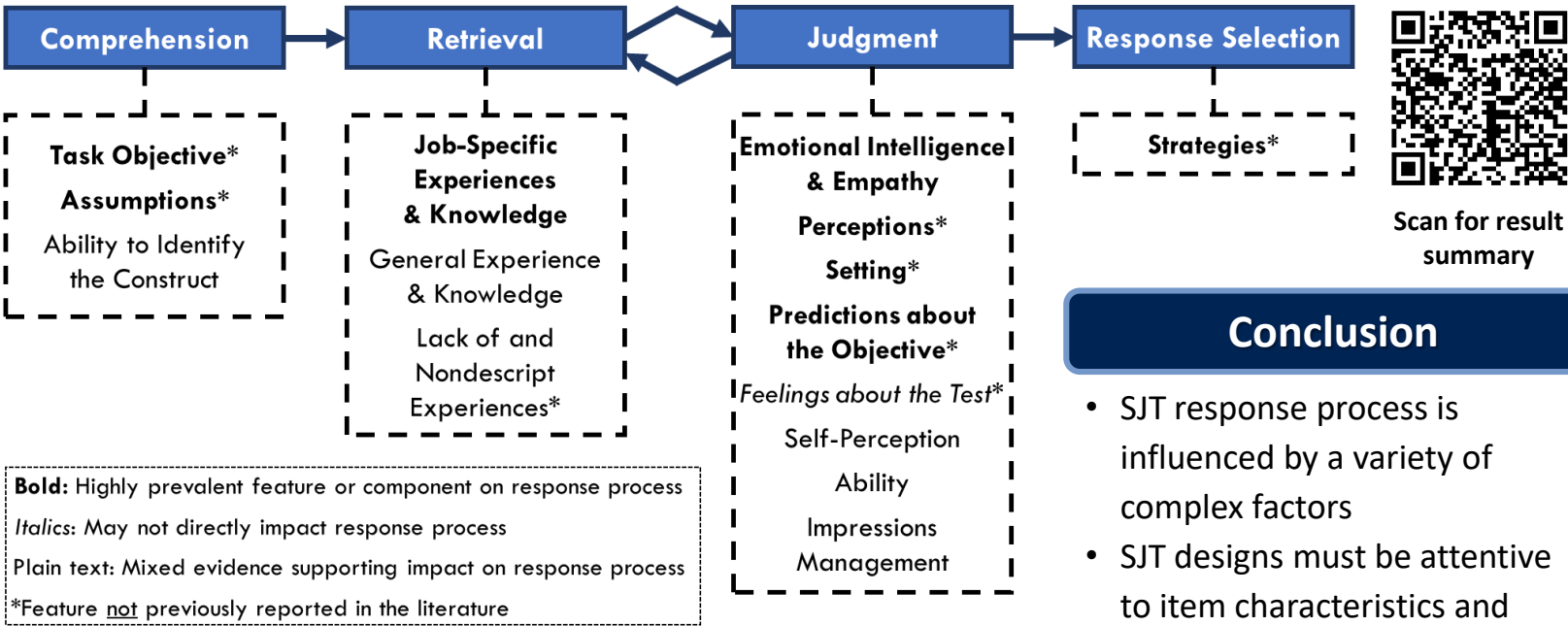
Results

Comprehension → **Retrieval** ⬥ **Judgment** → **Response Selection**

Comprehension
- **Task Objective***
- **Assumptions***
- Ability to Identify the Construct

Retrieval
- **Job-Specific Experiences & Knowledge**
- General Experience & Knowledge
- Lack of and Nondescript Experiences*

Judgment
- **Emotional Intelligence & Empathy**
- **Perceptions***
- **Setting***
- **Predictions about the Objective***
- *Feelings about the Test**
- Self-Perception
- Ability
- Impressions Management

Response Selection
- Strategies*

Bold: Highly prevalent feature or component on response process
Italics: May not directly impact response process
Plain text: Mixed evidence supporting impact on response process
*Feature <u>not</u> previously reported in the literature

Figure 2. Proposed SJT response process model

Scan for result summary

Conclusion

- SJT response process is influenced by a variety of complex factors
- SJT designs must be attentive to item characteristics and test-taker perspectives

IMPLEMENTATION OF A DIGITAL CURRICULUM AT A COLLEGE OF PHARMACY

Gary C. Yee, University of Nebraska Medical Center, USA

Objective: To implement a digital curriculum in a College of Pharmacy (COP)

Design: In March 2015, the UNMC COP formed a committee to transform the way faculty engage professional pharmacy students in the classroom to enhance teaching effectiveness. A strategy was developed based on Kotter's 8 step process for Leading Change. The committee served as the guiding coalition and developed a vision and guiding principles for the initiative. Discussion at the 2015 faculty retreat focused on why the COP should change curricular delivery, major barriers or obstacles, and a vision for the future. The 2016 and 2017 faculty retreats focused on key issues and updates. In Fall 2015, COP faculty were selected for campus-wide training in educational technology. Course and instructor evaluations were revised to include questions about student engagement. In July 2016, additional faculty agreed to receive training and consultation with instructional designers. In Fall 2016, the COP moved into a new building with education space equipped with next-generation technology and simulation. The professional curriculum goes paperless. In January 2017, faculty from the University of North Carolina School of Pharmacy led a faculty workshop on curricular transformation. In July 2017, nearly 40% of full-time faculty agreed to participate in a campus-wide digital curriculum training series and receive personalized consultation with an embedded instructional technologist. In Fall 2017, iPads were distributed to all students.

Assessment: Faculty and student educational technology surveys showed increasing use and acceptance of educational technology. The Pharmacy Curriculum Outcomes Assessment (PCOA) is a comprehensive standardized examination administered to all third-year pharmacy students enrolled in United States pharmacy schools. PCOA scores increased from 2016 to 2019.

Conclusions: Successful implementation of a digital curriculum requires strong leadership, strategic planning, faculty buy-in and involvement, and institutional support.

AN EVALUATION OF PHARMACEUTICAL WORKFORCE AND PHARMACY EDUCATION USING THE FIP'S WORKFORCE DEVELOPMENT GOALS: A CASE FROM QATAR
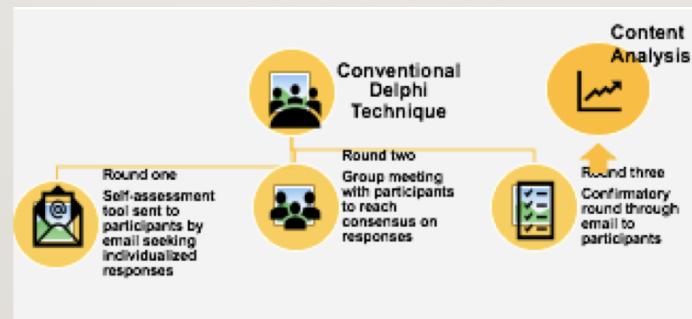
A-LEVEL BIOLOGY AS A POSITIVE PREDICTOR FOR YEAR 1 SUCCESS IN THE UCL MPHARM DEGREE

Sumaya Qumane, Christopher Russell, Elizabeth Mead and Michael R Munday

UCL School of Pharmacy, UCL, London, UK

Introduction: The study of Pharmacy in the UK puts great emphasis on prior learning in chemistry. It is the only core science Advanced-level General Certificate of Education (A-level) required as a pre-requisite (Sharifa *et al.*, 2003). However, in recent years the curriculum has become more clinically orientated (Waterfield, 2015). Curricular integration of science and clinical practice is called for in the General Pharmaceutical Council's 2010 Education standards (GPhC, 2011). There is concern that individuals with a background in chemistry alone may be less academically successful than those who have also studied biology.

Objective: In year 1 of the UCL MPharm programme, basic chemistry is taught in the module PHAY1002 "The Chemistry of Medicines" and biochemistry and pharmacology are taught in the module PHAY1003 "Body Systems and Therapeutics". In this study, the grades obtained in the examinations of these modules were compared for students who enrolled with A-level Chemistry and A-level Biology (C+B) with those who enrolled with A-level Chemistry alone (C-B).

Results: In the written examination of the PHAY 1002 (Chemistry of Medicines) module there was no significant difference between the scores of the C-B cohort (66% ± 2.08; mean ± SEM, N=49) compared to the score of the C+B cohort (69.8% ± 0.627; mean ± SEM, N=391). However, in the PHAY1003 (Body Systems and Therapeutics) module, the C-B cohort scored significantly less with 43.3% ± 2.51 compared to the score of 54.7% ± 0.791 of the C+B cohort (P<0.01).

Similar patterns of grade distribution were observed for the C+B and C-B cohorts in the PHAY1002 examinations. However, in the PHAY1003 module no student in the C-B cohort scored above 79%, whereas 4.61% of the students in the C+B did. More students scored 60-79 in the C+B cohort (35.8%) compared to the C-B group (20.4%). Fewer students with biology (C+B) failed with a score below 39 (14.3%), whereas 36.7% of students without biology failed.

Discussion: Sharifa *et al.* (2003) showed that the final honours classification of a pharmacy degree strongly correlated with differences in the grade attained in biology A-level. The current study suggests that students who enrol in the MPharm undergraduate programme at UCL without A-level biology will perform less well in biochemistry and pharmacology. Additional targeted support might positively impact on the progression of students without biology A-level.

References: General Pharmaceutical Council, (2011)
https://www.pharmacyregulation.org/sites/default/files/document/gphc_future_pharmacists_may_2011.pdf
Sharifa, S et al(2003) *Pharmacy Education*, 3, 1-10
Waterfield, J. (2015) Am J Pharmaceutical Education, 79(10), 153.

%	PHAY1002 Chemistry of Medicines		PHAY1003 Body Systems and Therapeutics	
	C+B Cohort	C-B Cohort	C+B Cohort	C-B Cohort
≥90	2.81 (n=11)	4.08% (n=2)	0.77% (n=3)	0%
80-89	19.7%(n=77)	16.3% (n=8)	3.84% (n=15)	0%
70-79	32.0% (n=125)	20.4% (n=10)	12.5% (n=49)	6.1% (n=3)
60-69	23.5% (n=92)	16.3% (n=8)	23.3% (n=91)	14.3% (n=7)
50-59	14.3% (n=56)	34.7% (n=17)	21.2% (n=83)	20.4% (n=10)
40-49	7.4% (n=29)	6.1% (n=3)	23.6% (n=92)	22.5% (n=11)
≤39	0.26% (n=1)	2.04% (n=1)	14.8 % (n=58)	36.7% (n=18)