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Academic pharmacy

Assessment of bachelor of pharmacy student understanding on pharmaceutical care

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Background: Pharmaceutical care is defined as patient-centred pharmacy practice that improves pharmaceutical therapy outcomes and patient health through responsible medication administration, collaboration with other healthcare experts, and active patient participation. The pharmacy curriculum incorporates content that equips students with the professional and interpersonal skills that allow them to provide patient-centred pharmaceutical care. Pharmacy students are trained to use a patient-centred approach, concentrating on each patient's unique needs, preferences, and goals.

Purpose: A standardised questionnaire was developed and used to collect feedback with the aim of evaluating the effectiveness of the Bachelor of Pharmacy programme. Third and fourth-year level Bachelor of Pharmacy (BPharm) students provided feedback following each practical session on pharmaceutical care. A total of 122 students responded to the questionnaire. The data were analysed using Microsoft Excel. The study did not require ethical clearance as this is part of the feedback mechanisms used in the B Pharm programme.

Methods: An analytical method to determine the concentration of THC in plasma was developed, and analytical parameters including stationary phase, mobile phase, detector, sample preparation technique, and biological matrix were identified.

The method was validated for accuracy, intra-day and inter-day precision, linearity, selectivity and stability, in compliance with the International Council of Harmonisation1 (ICH) guidelines.

Results: The survey data indicated that 56% of the students understood the significance of pharmaceutical care and prioritised patient-centred approaches. They expressed confidence in their ability to assume patient-centred roles within the healthcare system, citing the practical sessions as beneficial in acquiring the necessary skill set for effective engagement in multidisciplinary teams. However, 64% identified issues such as time constraints compounded by large patient loads in the public sector, communication barriers, and healthcare providers' reluctance to interact.

Conclusions: The results indicated that pharmacy students understand the relevance of pharmaceutical care and value patient-centred approaches in their professional development. They believe they are well-prepared to take on patient care positions in the healthcare system as a result of hands-on training that emphasises vital skills and teamwork across disciplines. However, issues such as time constraints, communication barriers, and limited interprofessional teamwork may impede pharmaceutical care. Addressing these concerns and meeting students' requests for more practical training might help them prepare for the changing demands of the pharmacy profession.

Empowering tomorrow's pharmacists: Unveiling social accountability through service learning on the Phelophepa Health Train

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Introduction: For students to become active citizens in their community, they must have knowledge of the issues facing the world around them. Higher education often employs service learning, a valuable form of experiential education, to facilitate students' integration of academic concepts and purposeful engagement with the communities around them. In this regard, the Phelophepa train, a mobile primary healthcare facility, provides an invaluable platform for pharmacy students at Rhodes University to engage in hands-on service activities, addressing the healthcare needs of underserved communities while enhancing their academic learning and professional development. However, there still exists a notable gap in research concerning the transformative journey students undergo throughout and following this immersive service-learning experience with regard to the engaged citizenry and social accountability. Therefore, understanding the factors that either redirect or reinforce students' motivations towards community service emerges as a crucial area of service that necessitates study.

Method: A qualitative research was conducted at Rhodes University in Makhanda, in the Eastern Cape Province of South Africa. Ethical approval for the study was granted by the Rhodes University Ethics Committee. Convenience sampling was used, targeting students that were willing and available to take part in the study. A total of less than 50 Rhodes University Pharmacy students volunteered on the Phelophepa Health Train in 2023 and 2024. Participants completed consent forms before taking part in the study. The participants' identity was kept anonymous. Data was collected using Focus Group Discussions (FGDs), and from written (typed) reflections submitted by the students based on their experiences of volunteering for a week each on the Phelophepa Health Train and was analysed using Thematic Analysis. Validity of data was determined through member checking. The data collected was stored by the researchers, and only they had access to it. The researchers also ensured that nothing on the FGD transcriptions or written reflections could be used to identify the participants.

Results: The themes that emerged from the data include responsible citizenry, awareness of societal inequalities in South Africa, problem-solving, cultural awareness, critical reflection and thoughts on future practices. Students reported that the service learning experiences inspired them to reflect on disparities in the South African health system and think about the role they could plan to alleviate this disparity. Seeing pharmacy personnel working on the Phelophepa Health Train heightened some students' sense of social responsibility and responsible citizenry.

Conclusion: This study highlighted the role that service-learning activities could play in promoting critical reflection by students and raising awareness of their current social responsibility and future practice as pharmacists.

Interprofessional mentoring pharmacy students in South African primary healthcare settings: experiences of the professional nurses

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Background: Work-based learning is essential in training pharmacy students, necessitating their placement in diverse clinical settings under the supervision of experienced pharmacists or health professionals. Pharmacists play an important role in primary healthcare, monitoring pharmaceutical services and care while supporting students and post-basic assistants. However, a notable shortage of pharmacists in the primary healthcare settings of South Africa impedes the direct supervision and mentorship of pharmacy students, who require primary healthcare experience as an integral part of their work-based learning. Consequently, professional nurses often assume the role of mentor for pharmacy students in this setting, despite their training and responsibilities traditionally focusing on the mentorship of nursing students.

Aim: The aim sought to describe the perceptions and challenges encountered by professional nurses tasked with mentoring pharmacy students within the primary healthcare settings of South Africa.

Method: A qualitative, descriptive study design was used, employing semi-structured individual interviews in 18 primary healthcare settings. Data was collected from 10 October 2023 to 20 October 2023 using an interview guide with professional nurses who have been mentoring pharmacy students since July 2017 within primary healthcare settings.

Results: Thematic data analysis revealed five themes: what the interprofessional mentoring entails; the challenges experiences by mentors; nurses needs to effectively mentor pharmacy students; how the professional nurses perceived the students and what was the professional nurse's occupational responsibilities.

The preliminary results revealed that professional nurses draw on their prior knowledge and experience to mentor the pharmacy students, including orientation to the workplace and establishing their year level, objectives, and knowledge before allocating them. The professional nurses created a

learning atmosphere, demonstrated procedures, and encouraged students to showcase their skills while explaining the pharmaceutical aspects of the facility.

Challenges encountered were a lack of information regarding students' presence, placement schedules, objectives, and their role. This is compounded by already heavy workload in the facilities. Nurses highlighted the need for the university to provide them with detailed information, guidance, training, and professional support.

Professional nurses perceived the students as appreciative, keen to learn, and outgoing. The interaction was mutually beneficial, allowing professional nurses to continue their duties while mentoring them.

Conclusion: The preliminary results suggest that collaboration between the university and the professional nurses in primary healthcare facilities must be improved. It is imperative that universities provide clear guidance and feedback regarding the clinical placements of the students. Additionally, professional nurses need in-service training on interprofessional mentoring and some recognition from the university for their contributions to clinical education. To facilitate the successful implementation of interprofessional mentoring of pharmacy students' additional personnel must be hired to relieve the workload and pressure experienced by professional nurses.

Veterinary pharmacy: A research elective course in the final-year of the pharmacy degree

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Introduction: Exit Level Outcome 3 (ELO3) of the South African Pharmacy Council (SAPC) professional competencies for pharmacists refers to dispensing and ensuring the optimal use of medicines prescribed to the patient. A person who has achieved this standard is capable of supplying medicines to humans and animals, on the prescription of an authorised prescriber. Although veterinary pharmacy is not extensively covered in the undergraduate BPharm curriculum in South Africa, it is relevant, and a basic knowledge of animal medicine and disease states can be beneficial to BPharm graduates. Such an elective has been in existence at one of the nine Pharmacy schools in South Africa for over 25 years.

Objective: To describe how Veterinary Pharmacy was incorporated into the Pharmacy curriculum to stimulate interest in animal medicine and health and also focus on research related to zoonotic diseases.

Method: A descriptive overview of a module in Veterinary Pharmacy that has been successfully presented to BPharm 4 students at Nelson Mandela University (NMU) in South Africa is provided, focusing on the rationale, learning outcomes, curriculum content, assessment, and research component of the elective.

Results: Pharmacists are involved in both the manufacturing and sales of veterinary medicine. There are veterinary pharmacies in South Africa, but it is not a specific area of specialisation with a prescribed curriculum. In the final year of study, pharmacy students at Nelson Mandela University must choose between a traditional research project or a coursework elective. The 18-credit (180 notional hours) elective module allows for specialisation in areas which are not extensively covered in the rest of the undergraduate pharmacy curriculum. The Veterinary Pharmacy elective has established itself as a popular elective choice. It is presented by two practising veterinarians who are supported by a pharmacist, and covers topics such as drug schedules in veterinary science/dispensing, legislation, common medicines used in veterinary practice, diseases affecting dogs and cats, zoonotic and controlled diseases (for example helminthes and rabies), and common toxicosis. The focus is on assisting students in counselling on basic animal medicine, knowing when to refer a patient with a sick small animal to a veterinarian, and understanding which human medicine can and cannot be administered to animals. The course is presented in the format of a series of interactive lectures with practical scenarios. The theory component is assessed by an examination. The elective also allows for applied mini-research projects, such as the recent rabies outbreak in South Africa, to be investigated forming a bridge between human and animal health. The research component comprises a mini-research proposal, a formal scientific research report and a poster presentation.

Conclusion: Veterinary Pharmacy is a relevant elective to offer to Pharmacy students interested in animal health. It provides an opportunity for interdisciplinary education, and it is also a unique opportunity for research into zoonotic diseases. This elective allows for some specialisation in a possibly neglected field in pharmacy education. The elective is well received by students and exposes students to a unique field in pharmacy practice.

Incorporation of Antimicrobial Stewardship Programme (ASP) into post-graduate pharmacy education curricula in Nepal

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Introduction: Antimicrobial resistance (AMR) is a global public health threat associated with inappropriate antimicrobial use, whereas the Antimicrobial Stewardship Programme (ASP) is the systematic approach to optimise antimicrobial use. Nepal, being a signatory of the 68th World Health Assembly (WHA) in 2015 and the United Nations General Assembly (UNGA) on AMR, 2016 have developed a National Action Plan for Antimicrobial Resistance, 2021-2026, with the inclusion of ASP as one of the strategies to tackle AMR. Nepal has received a Grant from the Fleming Fund to adopt the resolution from WHA, 2015 and UNGA, 2016. This review aims to evaluate the existing curriculum of postgraduate pharmacy education in Nepal and explore the knowledge and competency of clinical pharmacists in the area of Antimicrobial Stewardship.

Method: A qualitative study was conducted. A key informant interview was conducted by telephone with the head of the Department of Pharmacy/programme coordinator of the Pharmaceutical Sciences Program. Then, an in-depth analysis of syllabi provided by the respondents via email was performed to assess the existing gap in pharmacy curricula and address the current health issues. AMR, being an urgent health issue to resolve, needs assessment for inclusion of ASP in the curricula of post-graduate pharmacy education was done.

Results: Several studies highlighted the role of clinical pharmacists in the effective implementation of ASP. However, a lack of pharmacist knowledge in antimicrobial stewardship has been observed as a contributing factor to the increased inappropriate use of antimicrobials and a barrier to the effective implementation of antimicrobial stewardship in both clinical settings and community pharmacy settings. Nepal has three different universities offering post-graduate pharmacy education with a specialisation in clinical pharmacy. The post-graduate pharmacy education in Nepal is possible only after successful completion of the central entrance examination of registered pharmacists conducted by the Medical Education Commission of Nepal. A total of 3 universities offered clinical pharmacy education in Nepal. Pokhara University provides a degree in Master of Pharmaceutical Sciences (Clinical Pharmacy), Kathmandu University provides a degree in M Pharm (Pharmaceutical Care) as well as PharmD (Post Baccalaureate) and Purbanchal University provides a degree in Master of Pharmacy in Clinical Pharmacy. An in-depth analysis of all the curricula identified ASP as the missing component.

Conclusion: The establishment of need-based curricula will enhance the competency of future clinical pharmacists. Although the concept of a global AMR curriculum has been developed, the inclusion of ASP in curricula of post-graduate pharmacy education in Nepal in all universities is essential to address the lack of knowledge and skills of clinical pharmacists in antimicrobial stewardship. By preparing pharmacists with the knowledge and skills to promote prudent antimicrobial use, this initiative aims to mitigate AMR. There is an urgent need to incorporate antimicrobial stewardship programme education into postgraduate pharmacy curricula in Nepal.

Behaviour change support education in chronic disease: A cross-sectional survey of undergraduate European students

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Background: Chronic diseases represent a significant global health challenge, accounting for 40.5 million deaths in 2016 worldwide. Addressing chronic diseases is pivotal within the framework of the UN's Sustainable Development Goals. Health and other professionals are expected to support self-management of health behaviours in chronic diseases. Evidence indicates that insufficiencies in undergraduate education hinder their ability to adequately fulfil this role.

Purpose: To analyse the landscape of education at the undergraduate level to increase competencies in behaviour change support in chronic disease management across European countries and explore potential similarities in terms of countries and professions.

Method: Cross-sectional survey conducted between June 2023 and January 2024 via Google Forms (ethics approval 2022/298). The survey was developed based on a transnational learning outcomes-based curriculum and disseminated to healthcare students in European countries through national associations affiliated with their respective European umbrella associations, who were represented in

the research team (European Dental Students' Association-EDSA, European Medical Students' Association-EMSA, European Early Career Nurses and Nursing Students' Association-ENSA, European Pharmaceutical Students' Association-EPSA, European Federation of Psychology Students' Associations-EFPSA). A two-step cluster algorithm analysis was utilised to categorise students into optimal groupings based on similar characteristics derived from their responses to all questionnaire items.

Results: Among all participants (n=183), 81.4% of them were female (n=149). Nursing, pharmacy and dentistry were the most common degrees of the participants (57, 31.49%, 50, 27.62%, and 39, 21.54%). Most respondents were from Southern Europe and Central and Eastern Europe subregions (67, 36.61% and 57, 31.15%). Cluster analysis determined the optimal number of clusters to be 2, and the mean scores of the obtained clusters' components showed statistical significance ($p < 0.001$). The mean component scores of Cluster 2 were significantly higher than those of Cluster 1 ($p < 0.05$). Based on self-report, this indicates that Cluster 2 places a greater emphasis on content related to behaviour change support within their curriculum. The majority of respondents in Cluster 2 were from Southern Europe, whereas those in Cluster 1 were mainly from Western Europe ($p < 0.001$). Most respondents in Cluster 1 were Pharmacy students, while those in Cluster 2 were Nursing students ($p = 0.004$).

Conclusion: This exploratory survey indicates differences in terms of behaviour change support education for subregions of Europe and degree; southern Europe and nursing degrees showed fewer gaps in undergraduate education. These findings warrant confirmation with a larger and potentially representative sample to guide education efforts in the field. Moreover, students' reports should be supplemented with curricular analysis to identify specific gaps in relation to a transnational learning outcomes-based curriculum and the associated European competency framework.

Exploring first nations' and cultural safety content of pharmacy curricula with academics in Australia

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Introduction: This study aimed to explore academics' views on Aboriginal and/or Torres Strait Islander Health and Cultural Safety content in pharmacy school curricula to inform recommendations for future curricula.

Methods: All 18 Australian pharmacy schools were contacted, and interviews were conducted with consenting heads of schools and/or their delegate(s). The interviews covered what the school was doing with respect to the First Nations theme in the revised accreditation standards and further ideas for improvement. Audio recordings of interviews were transcribed verbatim via an online transcription service. Transcripts were thematically analysed and coded according to the framework approach and mapped to the Aboriginal and Torres Strait Islander Health Curriculum Framework. Coding was facilitated using NVivo software.

Results: All 18 schools consented to participate and a total of 22 interviews were conducted. The pharmacy accreditation standards were well known to most educators, however, the dissemination of the Aboriginal and Torres Strait Islander Health Curriculum Framework, introduced in 2014, appeared to be poor. Many interviewees (n = 14) expressed that the current content regarding Aboriginal health and cultural safety/competence was lacking and cited barriers that have led to a lack of development, such as a lack of First Nations staff and expertise.

Conclusion: While cultural safety/competency was taught in all Australian pharmacy schools, it is apparent that pharmacy schools are at various stages in their development of Aboriginal and Torres Strait Islander Health curriculum design and implementation. Future resources should be developed and made available.

Students' and pharmacists' perspectives of practical skills education for individualised and sustainable healthcare in pharmacy

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Background: The pharmacy profession has seen the continual addition of new skills and responsibilities to enhance the delivery of healthcare services. Safe dispensing and medication optimisation, preparation of extemporaneous medicines, point of care testing, physical assessment and, more recently, vaccination form core practical training components in the undergraduate pharmacy curriculum. However, research on practical hands-on skills training in pharmacy education is currently lacking, with most studies focussing on interpersonal and soft skills such as communication, teamwork, and critical thinking.

Purpose: This study examines the perceptions and confidence of graduating pharmacy students and pharmacists in performing practical skills in community pharmacy settings

with an aim to identify training gaps and opportunities in the practical skills curriculum.

Method: An online survey consisting of quantitative and qualitative questions related to practical skills training and confidence in application was administered to pharmacy students and practising pharmacists. A Likert scale was used for quantitative responses (e.g. 1 point for strongly disagree, 5 points for strongly agree, etc.), and mean scores were calculated to examine the importance of skill in practice, the confidence level of application of skill in practice and level of training received. Descriptive statistics were carried out using a statistical and data analysis tool, GraphPad Prism (p-value <0.05). The qualitative results were analysed using NVivo 12.

Results: Pharmacy students and pharmacists with community pharmacy working experiences participated in this study. Pharmacy students felt significantly less confident than pharmacists in the medicine dispensing process and in identifying and solving medication-related problems (e.g. drug interactions, dose anomalies) during this process. Students reported to have the same level of confidence as practising pharmacists in technical skills to prepare extemporaneously compounded medicines such as suspensions, creams and ointments. Both groups reported low levels of confidence in knowledge and technical skills for compounding sterile medicines, e.g. injectables, and eyedrops. Students reported lower confidence levels for conducting point-of-care testing, e.g., blood glucose level checks; however, they reported higher confidence levels for patient education of devices such as asthma inhalers and blood glucose meters. Both student and pharmacist groups prioritised the physical assessment of patients as the most important practical skill training, followed by the use of digital health records for optimising therapy and outcomes for individual patients. Training on access and use of individual patient health information, e.g. electronic health records, was suggested as an area needing improvement in undergraduate pharmacy education. Participants also suggested a wider range of practical skills training in undergraduate pharmacy curriculum, including dispensing software and digital health platforms, inventory management, claims and reimbursements, business management and technical knowledge and skills for a range of commonly compounded extemporaneous medicines.

Conclusion: Individual patient assessment and use of digital health systems to optimise patient experience and outcomes were identified as most important practical skill training areas in pharmacy education. A blended educational approach involving online learning resources, university-based hands-on skills labs and practical experiential placements would facilitate in building students' knowledge and skills, confidence and competence in pharmacy practical skills

Motivations and trends in the choice of higher education: A Survey of high school students

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Introduction: In February 2024, a survey aimed at high school students in the province of Jujuy was shared on social media. The purpose of this survey was to analyse the motives and trends that guided the decision to pursue higher education and focus on the option of studying pharmacy.

Method: Exploratory, quantitative and cross-sectional study using the online survey technique with closed, multiple-choice or dichotomous questions.

Results: Out of a total of 58 high school students who conducted the survey, 82.5% resided in the capital city, 72.4% of the students were between 16 and 19 years old, and 79.3% were in the 4th or 5th year of secondary school. 98.3% answered that they plan to pursue higher education after completing secondary education. Of this percentage, 86% plan to pursue university studies and 8.8% plan to pursue a teaching career.

The provinces chosen to continue their studies were Jujuy (8.8%), Córdoba (31.4%), Buenos Aires (14%), Autonomous City of Buenos Aires (14%), Salta (3.5%) and Tucumán (3.5%).

The good level of educational institutions was the most chosen alternative when justifying the choice of the province (56.1%).

Prospective students indicated that they will finance their studies through work and the support of their families (69%), will receive only help from their family (21%) or will work as their only source of income to pay for their studies (3.5%).

Health sciences was the most selected field (28.1%), followed by Natural and Exact Sciences (19.3%), Social and Legal Sciences (17.5%), Computer Science (15.8%), Arts, Humanities and Education (12.3%) and Engineering and other technological careers (7%).

At the beginning of the survey, only 15.5% said that studying pharmacy would be an option. More than 75% of students say they are unaware of the functions performed by a pharmacist described in the survey. 87.9% were unaware that the pharmaceutical profession is in high demand in the labour market.

At the end of the survey and in the face of the reiteration of the question: Would you consider studying pharmacy? 50% said no, 27.6% didn't know, and 22.4% said they would.

The survey shows a high interest in the profession. However, according to data published at the national level, in relation to a set of university degrees in the field of health (psychology, pharmacy, medicine, biochemistry, kinesiology

and dentistry), those enrolled in pharmacy represent only 2.8% and show a decreasing trend. (Human Resources for Health Observatories, 2018).

Conclusion: Although the results of the survey highlight interest in the career in pharmacy, there is a lack of knowledge among students about the responsibilities of the pharmaceutical profession, activities and functions performed by pharmacists. Finally, studies indicate that the career in pharmacy has a low percentage of enrolees, so promotional actions based on the dissemination of the practice of the pharmaceutical profession could generate, in addition to interest in the profession, a greater number of future students enrolled in the career.

Certification and competency frameworks

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Background: In pharmacy education, competency frameworks are used to encompass technical, organisational, communication skills, values and behaviours to develop pharmaceutical workforce that can contribute to patient safety and patient care. The competency frameworks are developed to guide and support educational practices in order to enhance early pharmacy education.

Purpose: To identify and compare competency frameworks for pharmacy that are available internationally.

Method: Competency frameworks available globally, regionally and nationally were identified through an online search using "competency frameworks for pharmacists" as keywords.

Results: To date, 11 frameworks have been identified. The frameworks of Australia, Canada, the United States, and the global competency framework developed by the International Pharmaceutical Federation (FIP)4 were compared. These four frameworks were evaluated against the Japanese Competency Framework5. The content showed commonalities in core domains, namely health promotion, pharmaceutical care, professional and personal development, and communication. Differences were found with the inclusion of new emerging domains such as entrepreneurship, the tendency for simplified versions, and the incorporation of domains related to cultural attributes such as Kampo medicine.

Conclusion: The frameworks showed similarities in the outline of the core domains. The distinctions were associated with the design of updated, user-friendly versions of culturally related and new emerging domains reflecting the evolving nature of the profession. The examination and comparison of these competency frameworks offer valuable insights into the international perspectives on practice optimisation and standardisation, as well as the expected competencies of proficient practitioners.

An international medication optimisation certificate programme designed to enhance the growth and evolution of clinical pharmacy worldwide

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Introduction: The American College of Clinical Pharmacy (ACCP) is a professional and scientific society that provides leadership, education, advocacy, and resources enabling clinical pharmacists to achieve excellence in practice, research, and education. ACCP is the professional home for more than 16,000 clinical pharmacists, scientists, educators, postgraduate trainees, students, and others from more than 60 countries. ACCP's mission is to improve human health by extending the frontiers of clinical pharmacy. The organisation's strategic plan includes a goal to enhance the growth and evolution of clinical pharmacy worldwide and an objective to determine the need and demand among international audiences for ACCP programs focused on medication optimisation. Consistent with the strategic plan, the purpose of this project was to develop a certificate programme for international pharmacists focused on achieving medication optimisation through the provision of comprehensive medication management (CMM).

Methods: The certificate programme is a 10-week virtual course delivered by faculty with expertise in CMM implementation. The curriculum includes five learning modules: 1) Medication Optimisation and CMM Primer, 2) The Patient Care Process for Delivering CMM, 3) CMM: Implementation, 4) CMM: Evaluation, and 5) Practice-Based Considerations and Challenges. Each module includes a live, virtual workshop preceded by pre-session required readings, pre-recorded video presentations, downloadable slide decks, supplementary tools, self-assessment questions, and a practice-based application exercise. Certificate requirements include completion of all practice-based application exercises and achieving a passing score (> 70%) on each pre-session self-assessment test and the cumulative post-course assessment.

Results: A total of 226 pharmacists from 63 countries have participated in the course. Based upon data from a voluntarily completed pre-course survey of registrants in 2022 (n = 21) and 2023 (n = 20), 39% of participants held a Pharm.D.

degree, 37% a B.S. degree, and 20% a Clinical Pharmacy M.S. degree; 37% had been practising for 0-5 years, 12% for 6-10 years, 24% for 11-15 years, 10% for 16-20 years, and 17% for > 20 years. Among respondents to this pre-course survey, 15% indicated that they were very familiar with CMM, 68% were somewhat familiar with CMM, and 17% were not at all familiar with CMM. The pharmacists who enrolled increased their familiarity with CMM, and 67% (n = 151) successfully met the course's certificate requirements.

Conclusion: Based upon participation to date, there is a demand among international audiences for a certificate programme focused on medication optimisation.   This provides a foundation for future evaluation of the program's impact on ACCP's goal to enhance the growth and evolution of clinical pharmacy worldwide.

DOORS: Pioneering integrated digital health education for future healthcare and AI engineering professionals

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Introduction: Digital transformation in healthcare catalyses an unprecedented need for a paradigm shift in education, where the confluence of healthcare and engineering expertise is critical. The Digital Open Online Resources Sharing (DOORS) platform, supported by major French institutions such as the French National Research Agency, the French Ministry of Research and Higher Education and the French School of Artificial Intelligence of Grenoble EFELIA MIAI, embodies this new wave of innovative educational frameworks. It is ingeniously designed to reduce the skills gap between healthcare professionals and engineers, fostering an ecosystem where interdisciplinary collaboration flourishes and co-construction of digital health solutions becomes the norm.

Method: The creation of DOORS represents a groundbreaking collaborative effort, incorporating a rich mosaic of expertise in the clinical, technological, and educational fields. Its architecture is rooted in the use of interactive Jupyter e-workbooks, facilitating a dynamic learning environment where theoretical knowledge is seamlessly integrated with data-centric, hands-on exercises. This innovative approach is complemented by a suite of professional health tools and comprehensive and authentic health datasets, ensuring learners engage in experiences that accurately reflect the nuances and complexities of the healthcare industry. The platform is strategically designed to be adaptable, with the vision to become a fundamental element in various health engineering and AI curricula, illustrating its potential as a universal educational solution.

Results: DOORS has already been successfully integrated into the main university's initial training programme dedicated to artificial intelligence in health at the University of Grenoble-Alpes. Nearly 200 engineering students have already been able to benefit from this platform to follow courses in digital health such as "Health Data Management" and "AI Applications in Healthcare". To date, a catalogue of a dozen practical works has already been deployed on the platform, offering practical experience with concrete applications. This hands-on component allows learners to not only understand the theoretical aspects of digital health but also to apply their knowledge in practical contexts, further preparing them for the professional challenges they will face in the healthcare sector.

Summary: DOORS is an innovative educational tool that uses digital technologies for health education, and a driver of change in health education, reflecting a forward-looking approach for a new generation of professionals who can adjust to the evolving digital healthcare context. Starting from the 2024 academic year, the authors aim to train almost 1200 students per year by incorporating the platform into all initial training courses in health and AI for health. By matching the training paths of healthcare professionals and engineers, the platform will help future professionals to not only comprehend the issues of digital in their own area, but also to work with engineers to design and apply effective digital health solutions.

In the face of the rapid evolution of healthcare, driven by advances in AI and digital technologies, the role of platforms like DOORS in educating, empowering and inspiring students is vital, creating the conditions for a new era of integrated, interdisciplinary health education ready to meet the challenges of the digital age.

Innovation for the future of international advanced practice pharmacy experience rotations

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Introduction: Interest in international Advanced Practice Pharmacy Experiences (APPEs) decreased during the COVID-19 pandemic due to the inability to travel. Interest continues to be lower than pre-pandemic levels, as evidenced by lower rates of students participating in international APPEs during the 2023-2024 academic year. To address this lack of student engagement, this school developed an International APPE Showcase to highlight individual country opportunities.

Objective: The International APPE Showcase were to increase student interest in international rotations, collaborate with existing international preceptors to deepen existing

relationships, and foster donations from alumni to the Office of Global Health to be used for student travel.

Methods: To highlight these international APPE sites, the authors decided to showcase one international partner annually. Donor funding supported the international preceptor(s)' travel costs.   For the showcase, the international preceptor(s) were asked to give a school-wide in-person guest lecture(s) about their health system and pharmacy practice at their site country, health system, and the APPE rotation. Students were encouraged to stay after the talk to connect with the preceptor(s) and ask additional questions. Students also provided written reflections on how the presentation influenced their professional identity. Additionally, preceptors attended a brunch with international APPE alumni who completed clinical rotations at the preceptor's home APPE site. During the brunch, testimonials from alumni were collected for international APPE marketing and fundraising.   Finally, preceptors were connected with other health schools on campus to foster engagement that may augment their home country research or clinical site.

Results: Prior to the showcase, four students enrolled in an international APPE (4/96; 4%) during the 2023-2024 academic year. Post-showcase, 15 students enrolled in international APPEs (15/121; 12%) for the 2024-2025 academic year; 10 of these students chose to complete their rotation at the site that presented the prior year. Additionally, international preceptor connections with other health schools resulted in a new public health relationship, medical supplies for a rural clinic, and promotion of the rotations to other health schools as applicable. Alumni testimonials were recorded during the brunch regarding their experiences, including how the rotation influenced their career and personal life. These will be used as promotional material on the international APPE website. Alumni donations were not requested during the brunch, but it was hypothesised that this engagement would produce future donations.

Conclusion: The International APPE Showcase reinvigorated the international APPEs for students and brought the possibility of travel back to the forefront of students' minds. International preceptors gained connections with other health schools that enhanced their clinical practice and research, as well as the opportunity to obtain supplies for their sites. Future steps include making the brunch into a fundraising event to support student travel.

Co-creating an integrated 2SLGBTQ+ pharmacy curriculum with communities: Successes and learnings from years one and two of the Queer Curriculum Advisory Committee

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Introduction: To address the ongoing health disparities experienced by 2SLGBTQ+ communities, taking a community-based approach to developing a SOGIE-inclusive curriculum for health professionals is critical. SOGIE education was scaffolded throughout all four years of the Entry-to-Practice Doctor of Pharmacy programme at the University of British Columbia. This presentation is for faculty and staff interested in collaborating with communities to co-create a SOGIE-inclusive curriculum.

Method: To bring together community voices and perspectives, the Queer Curriculum Advisory Committee (QCAC) was founded in 2022, inviting 2SLGBTQ+ subject matter experts, community members and partners to work alongside students, faculty members and staff. The QCAC's mandate is to advise on the planning, implementation, and evaluation of SOGIE education in undergraduate pharmacy training. In Year 1, QCAC work focused on curriculum development and content review. In Year 2, as curricular components matured, the QCAC shifted its focus to curricular evaluation, advocacy, and consultations. Annual evaluations of the QCAC were conducted in 2023 and 2024 to provide insight into the committee's functions and to ensure it continues to fulfil its mandates. Committee members were surveyed anonymously to collect their feedback on the committee's operations, dynamics, structure, performance, and member self-evaluation. Additional data was extracted from the meeting minutes.

Results: Year 1 and 2 evaluations captured eight meetings. Quantitative and qualitative data for each domain was analysed, with notable findings in the following domains: Dynamics: Members felt positive about the committee's culture and dynamics. Structure: Although members agree the QCAC includes a broad diversity of lived experiences, the need to include Two-Spirit voices was identified. Performance: Members agreed that the committee contributed to positive outputs toward the development of a SOGIE-inclusive curriculum. Members appreciated the faculty's responsiveness to community needs and their input. Self-Assessment: Members viewed their personal level of engagement as favourable.

Conclusion: To create inclusive curricula, effective community engagement is crucial. This evaluation provides insight into the QCAC's strengths and areas of improvement.

An examination of guidance for student implementation of emerging technologies and artificial intelligence in the promotion of public health

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Introduction: Proactive management of developing technologies allows for the ethical and thoughtful application of this technology in a variety of components of pharmacy education and practice. Guidance for student education regarding available technologies and lawful application can ensure that students meeting qualifications for graduation from an accredited programme are able to assess the usefulness and current technologies in managing acute therapies for an individual patient as well as solving global health challenges. It is beneficial and necessary that student pharmacists are taught about technologies affecting drug development as well as the patient care model in both individual counselling and global health efforts. Accreditation agencies governing pharmacy education in the United States establish standards to ensure that graduates have a working knowledge of sciences, available resources for accessing drug information, pharmacy law and the determination of goals for patient care. Consistency of guidance and parameters for the safe, ethical, and efficient application of current and developing technologies ensures that new graduates are able to collaborate and apply technology appropriately for the best patient outcomes.

Objective: To review the guidance and accrediting standards for pharmacy education with regard to digital health, including telehealth and other technologies in pharmacy education.

Method: Curricular guidance and accreditation standards from the American Academy of Colleges of Pharmacy (AACP)-Curricular Outcomes and Entrustable Professional Activities (COEPA), the Accreditation Council for Pharmacy Education (ACPE), and ACPE International Accreditation were reviewed to determine the inclusion of public health and technology topics such as digital health, telehealth, informatics, and artificial intelligence.

Specifically, these materials were assessed for content and language guiding accredited Doctor of Pharmacy (PharmD) programs in the U.S. and globally on the education of students in the application of technology in areas of drug development, drug information reference and therapy outcomes.

Results: Accreditation bodies governing and ensuring quality pharmacy education in a variety of countries around the world include educational outcomes for programme graduates to manage patient healthcare needs by applying technology to optimise the efficacy and safety of medications. Additionally, ACPE includes guidance for secure, effective and federally compliant use of health informatics data and software. In its guidance for the use of Libraries and Educational Resources in pharmaceutical care, COEPA includes language to support one's continued professional competence in recognising and evaluating new topics, which could include informatics or artificial intelligence.

Conclusion: It appears that educational guidance and accreditation standards for pharmacy education include relevant, timely and emergent topics of digital health, telehealth, informatics and other evolving technological advances that enable pharmacy students to enter professional practice with competency to provide patient care in accordance with laws and optimal health outcomes.

Medical and pharmacy students' perceptions of their IPE and cultural competencies following an innovative course

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Background: Cultural competency (CC) training of health professional students has become an accreditation requirement to prepare such students to become practitioners equipped to provide culturally appropriate and acceptable quality care for patients of diverse backgrounds in an effort to assist in reducing health and healthcare disparities. This study describes an innovative CC-required semester course offered in an interprofessional education (IPE) setting involving medical and pharmacy students. IPE has been identified as essential in preparing graduates for interdisciplinary collaborative team practice, another approach documented to promote better health outcomes, especially for underserved populations.

Method: Since the Spring 2017 semester, an average of 200 students of Touro University's Colleges of Osteopathic Medicine and Pharmacy in New York have been offered an innovative course co-directed and co-taught by faculty of both colleges, supported by guest lecturers representing populations of diverse cultural backgrounds by race/ethnicity, religion and gender among others. Many innovative strategies have been employed to break down professional and cultural barriers in the classroom, including offering the opportunity for the students to experience and

reflect on their own diversity in the classroom and assigning IPE teams of medical and pharmacy students to plan and present a health promotional campaign to reduce the vulnerability of their assigned target population to their most important public health problem/disease. At the end of the Spring 2022 iteration of the course, an anonymous and voluntary Interprofessional Collaborative Competencies Attainment Survey with additional CC items (ICCCAS) was administered through Qualtrics to collect data on the student's perceptions of their IPE competencies-Communication, Collaboration, Roles & Responsibilities, Collaborative Patient/Family Centered Approach, Conflict Management/Resolution, and Team functioning. The CC side of the survey evaluated their knowledge and skills pre-and post, although both datasets were collected at the end of the course. An IRB application is being submitted to the Touro University Health Sciences IRB to seek authorisation to analyse and present these aggregate findings and later publish them in a peer-reviewed journal for the benefit of other institutions.

Results: Ninety-five (95) students out of the total enrollment of 194 in the course completed the ICCCAS survey, giving a response rate of 48.9%. Survey findings will be reported as aggregate pooled frequencies (%) of respondents who agreed and strongly agreed with each of the items in the survey domains and tested for statistical significance between the pre-and post-course data.

Conclusion: The analysis of the survey findings is expected to provide some evidence for the effectiveness of this innovative course in providing an opportunity for the medical and pharmacy students of the Touro University in New York to develop both the IPEC competencies and the Cultural Competency needed to provide patient-centered care for people of diverse backgrounds and thus contribute to reducing health disparities.

The Kuwaiti pharmacy leadership landscape: Exploring perspectives from pharmacists and pharmacy students

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Background: Leadership in healthcare has become increasingly crucial for navigating complex challenges and driving positive change. This is especially true in the pharmacy profession, where pharmacists play a vital role beyond technical and clinical expertise. Existing leadership research on leadership primarily focuses on Western contexts, creating a gap in understanding leadership within the Kuwaiti pharmacy landscape. As the pharmacy profession evolves in Kuwait, identifying essential leadership skills tailored to this environment is critical.

Purpose: This study aims to gain an in-depth understanding of leadership perceptions, required competencies, and the obstacles hindering leadership development within the Kuwaiti pharmacy sector.

Method: The study employed a qualitative approach with data source triangulation to enhance data richness and credibility. Semi-structured explorative interviews explored leadership perceptions and development challenges faced by pharmacists at various career stages in different sectors (academia, industry, hospitals, and private practice).

Participants were recruited through purposive sampling. While focus groups used snowball sampling, pharmacy students who are educated in Kuwait were recruited via lecture announcements at Kuwait University, and Kuwaiti students educated in the UK were recruited at the University of Nottingham via email. All collected data were audio-recorded, transcribed, and inductively analysed using thematic analysis with the support of NVivo.

Results: Data was collected from May 2023 to February 2024. In-depth interviews were conducted with 22 pharmacists (12 Females, 10 Males) across diverse sectors. Five focus groups (n=20, 3-6 participants each) were also conducted with Kuwaiti pharmacy students from Kuwait University and the University of Nottingham, UK. Thematic analysis of all data revealed five key themes: 1) leadership perceptions, exploring how pharmacists and students understand and define leadership in the Kuwaiti pharmacy profession; 2) leadership competencies and behaviours, identifying the essential skills and behaviours considered critical for effective leadership. This theme highlighted the importance of communication, vision, leadership and management expertise, and policy awareness, 3) challenges hindering leadership development within the Kuwaiti pharmacy profession, including both organisational and cultural barriers, 4) successful leader characteristics explored the key attributes and behaviours that distinguish successful leaders in the Kuwaiti pharmacy context and 5) the perceived value and necessity of leadership development programs for pharmacists in Kuwait. An additional theme emerged explicitly from the focus groups: cross-cultural perspectives. This theme explored how differences in living environments and course structures influenced leadership perceptions between students studying abroad and those at local universities.

Conclusion: This study enhances this understanding of how the Kuwaiti pharmacy sector perceives and approaches leadership. The findings suggest a solid foundational knowledge of leadership principles among both pharmacists and pharmacy students. Utilising data from both pharmacists and students provided a richer perspective on leadership within the Kuwaiti pharmacy landscape. Furthermore, the study underscores the importance of fostering successful leaders and highlights key challenges requiring targeted

efforts to cultivate leadership development within the Kuwaiti pharmacy profession. Ultimately, these results will inform the development of a leadership framework for the Kuwaiti pharmacy profession, aiming to prepare future Kuwaiti pharmacists for the evolving healthcare landscape.

Opioid deprescribing: Lessons learned from a focus group study conducted with student pharmacists across the United States

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Background: The consequences of inappropriate opioid use continue to be a healthcare challenge in the United States (US). Interprofessional efforts to deprescribe opioids may help address this issue. However, student pharmacists' perspectives of the pharmacists' role in deprescribing opioids have not been investigated. It is important to explore these perspectives to better understand how the next generation of pharmacists can contribute to addressing inappropriate opioid use.

Purpose: The purpose of this project was to explore how student pharmacists perceive the role of the pharmacist when deprescribing opioids.

Method: In 2021, student pharmacists from three US colleges of pharmacy participated in online focus groups about the pharmacist's role in deprescribing opioids. Focus groups were conducted by one researcher and followed the same semi-structured guide. Interviews were audio recorded and transcribed. Two researchers independently analysed the transcripts using inductive and deductive approaches and identified themes. Each college's institutional review board approved this study.

Results: Two themes were identified: barriers and facilitators to opioid deprescribing and increasing deprescribing experiences in the pharmacy curriculum. Students commented that pharmacists' relationship with the patient could be a barrier or facilitator to opioid deprescribing, and a good collaboration with physicians, including collaborative practice agreements, could help facilitate opioid deprescribing. Students commented they were not comfortable communicating with patients about opioids specifically. Additional educational experiences, including objective structured clinical exams, simulated experiences, collaborative training with other healthcare professionals, and motivational interviewing techniques, were all suggested to assist students in overcoming their hesitancy with opioid deprescribing.

Conclusion: The barriers, facilitators, and recommendations to increase educational experiences around opioid deprescribing offer insights into the perspectives of US student pharmacists. These findings may help colleges of pharmacy improve and implement educational activities that focus on opioid deprescribing and better prepare pharmacists to manage inappropriate opioid use.

Development of pharmaceutical public health programmes: Experiences from South Africa and Belgium

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Background: Pharmaceuticals and other health products contribute to preventive and curative care, with pharmaceutical health systems recognised as an essential component of the health system. Strengthening and advancing the capacity of the pharmacy workforce is an integral strategy for enhancing health system performance, but traditional undergraduate curricula have a limited focus on population-based and system-focused approaches that are required for pharmaceutical management and policy within health systems. Pharmaceutical Public Health (PPH) is an emerging field in global health that focuses on analysing and strengthening health systems by applying a multidisciplinary approach to navigate and integrate components of effective pharmaceutical systems.

Purpose: The authors describe the development of Pharmaceutical Public Health programmes to meet gaps in the professional skills of pharmacists and others involved in pharmaceutical systems across sub-Saharan Africa and beyond at the University of the Western Cape (UWC), South Africa and the Institute of Tropical Medicine (ITM), Antwerp, Belgium.

Method: The authors used the 5-phase ADDIE model to guide the collaborative development and implementation of three one-week face-to-face short courses and three online semester modules at UWC, starting in 2014. Building on this experience, the authors jointly developed an international, accredited three-week face-to-face course at ITM, which was

first presented in 2021. The programmes at both institutions offer participants a comprehensive grasp of pharmaceutical systems' components and interconnections, enabling practical insights aligned with their roles and contexts while fostering multidisciplinary perspectives. They target participants from diverse backgrounds and sectors including, but not limited to, Ministries of Health, regulatory agencies, procurement, and health insurance. Both programmes encourage a rich exchange of experiences among professionals at different levels within health systems, extending beyond pharmacists or specialists in specific pharmaceutical areas.

Results: At UWC, between 2014 and 2019, 140 participants attended one-week face-to-face short courses in Rational Medicines Use, Medicines Supply Management, and Pharmaceutical Policy and Management held at the annual School of Public Health Winter School; and between 2015 and 2023, 128 participants took the online semester modules in Rational Medicines Use; Medicines Supply Management; and Pharmaceutical Policy and Management. Overall, 60% of the participants in these courses were female; the majority were pharmacists, and most were working in government health services or NGOs. Participants were from 17 sub-Saharan African countries.

At ITM, between 2021 and 2023, 50 participants attended the three-week course in Pharmaceutical policies held annually in June. After completion of the course, they joined an informal Google Group platform managed by the course conveners for exchanges on pharmaceutical policies, as well as the broader ITM Alumni communities. This informal 'community of practice' facilitates long-term exchanges and potential collaborations, including the commencement of PhDs and joint publications.

Conclusion: Overall, the Pharmaceutical Public Health programmes at UWC and ITM are dedicated to advancing the practice of Pharmaceutical Public Health. The authors are jointly committed to improving population health outcomes, promoting equitable access to medications, and shaping policies that optimise the use of pharmaceutical interventions to benefit individuals and communities.

Advancing interprofessional education in pharmacy in French-speaking countries: Insights from CIDPHARMEF survey

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Integration of Interprofessional Education (IPE), in partnership with patients and families, in pharmacy training reflects the advancement of interprofessional practice. CIDPHARMEF, an association comprising 62 French-speaking Faculties/Schools of Pharmacy (FoPs) from 21 countries, shows variation in IPE adoption. A CIDPHARMEF working group aims to raise awareness among pharmacy faculties of the importance of teaching collaborative practice/patient partnership and to support the implementation of IPE activities adapted to local pharmaceutical care.

In 2023, a survey was sent to deans of the 62 FoPs to identify FoPs offering IPE and map available educational resources. Its six main themes were school demographics, IPE teaching strategy, IPE curriculum structure, teaching organisation, student competence assessment, research on IPE, and IPE development perspectives.

Thirty FoPs (48.4%) responded, with 23 in high, 2 in medium and 5 in low Human Development Index (HDI) countries. Seventeen faculties, all in high HDI countries, are currently involved in IPE activities, 10 of which have been offering IPE for over five years. Four plans to implement IPE. The average IPE teaching hours per student is 42.6 hours (SD = 39.0; min <20h; max >100h); IPE starts in the 2nd year in 6 faculties and is proposed in the final years (5th and 6th) in 15 faculties. IPE activities offered to pharmacy students mainly involve medical (84.2%) and nursing students (73.7%), among others. Local demand primarily drives IPE development. IPE is led by interfaculty entities in 7 universities and is managed directly by the FoP in 6 others. Only two faculties have a dedicated space for IPE, and five have trained teachers in IPE.

This survey is the first step in supporting the development of IPE curricula and the involvement of patients as educators in French-speaking countries. The next step is to create a repository of shared French pedagogical materials and experiences.

How academic courses align with pharmacy practice and strategies to improve it: Application of an online survey

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Introduction: The Internacional Pharmaceutical Federation (FIP), Development Goal 1, highlights the need to ''build relationships with relevant stakeholders to best align scientific content of academic courses with contemporary professional practice in pharmacy and pharmaceutical science''.

In 2014, the South and Autonomous Regions Branch (SARB) of the Portuguese Pharmaceutical Society (PPS) launched the ''OFuturo'' strategy which aimed to, among others, establish a partnership with Higher Education Institutions (HEIs) and thus enhancing practice-academia collaborations.

Purpose: This study aims to characterise the alignment between pharmaceutical education and practice needs and to explore the strategy used by HEI educators to link academia and pharmacy practice.

Method: An online survey was conducted in partnership with HEIs that offer the Pharmacy degree located in the South and Autonomous Regions of Portugal. The survey was disseminated through digital communication to educators registered in the PPS database and with the help of the above-mentioned HEIs. HEI educators without a Pharmacy degree were excluded from the study.

Results: 47 educators responded to the online survey, of which 9 (19%) were educators and practitioners. Of the participants who responded to the survey, 62% (n=29) consider that the scientific content of academic courses is in line with professional reality and 96% (n=45) claim to promote the link between academia and professional practice. Regarding the actions used by respondents to bring future pharmacists closer to practice, 70% (n=33) preferred to share their professional experience with students, and 64% (n=30) chose to invite practitioners to their classes. Nonetheless, 66% (n=31) indicated that the PPS plays an important role in the process of linking academia and professional practice.

Conclusion: Professional organisations and academies play a crucial role in bringing together education and practice. Additionally, every educator should be aware of the need to constantly update of scientific contents according to scientific developments and to find strategies to better prepare their students for the reality of professional practice.

A pilot study to enhance leadership skills among pharmacy students in Taiwan

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Background: Leadership development is crucial for the future success of pharmacy students. However, it is not well integrated into the pharmacy education curriculum in Taiwan. To address this gap, the Pharmacy Leadership Development Programme (PLDP) was launched by a US-registered non-profit organisation (NPO) in early 2024 to cultivate leadership development among pharmacy students in Taiwan.

Purpose: The purpose of this study is to outline the characteristics and preliminary achievements of the PLDP since its implementation in early 2024

Method: The PLDP is an eight-month longitudinal programme initiated by the Taiwan-Overseas Pharmacy Networking Organisation (TOPharmNet), a US-based non-profit organisation aiming to advance the pharmacy profession in Taiwan. The programme comprises the following components: (1) virtual monthly rotations akin to advanced pharmacy practice experiences, providing insights into the operations of leading a pharmacy organisation; (2) tailored networking and mentorship to align with students' career interests; (3) a capstone project addressing pertinent pharmacy issues or organisational quality improvement; and (4) monthly meetups to review students' needs and provide leadership lectures to complement practical experiences with theoretical understanding. A questionnaire for students to provide feedback has been disseminated after each rotation. This architecture is designed to harness nonprofit operational experiences, enhance participants' leadership skills, and prepare them as critical-thinking leaders in healthcare solutions.

Results: Three pharmacy students from different pharmacy schools in Taiwan have been selected to participate in this innovative program. The rotation involves seven programs within the NPO, with eight executives as mentors participating on a monthly basis. Early feedback and initial debriefing from both the students and mentors suggest a positive reception and valuable learning experiences. Feedback indicates that participants find the programme meaningful, particularly from a mentor's perspective. Furthermore, all mentees learned about the organisational structures and performed tasks that were not part of their school experience.

Conclusion: The preliminary results and feedback from all participants in the PLDP seem promising. The programme is ongoing, and the final results will be available in September 2024.

Exploration of Students' 5 voices Leadership and teamwork style

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Introduction: Leadership development assessments are a critical component of student pharmacists' understanding and development of effective team strategies. Leadership development has long been an important component of pharmacy education. However, not all pharmacists aspire to a formal leadership position. Despite this, leadership development is valuable in preparing students for non-positional leadership (or "little l" leadership), which impacts all graduates.

ACPE accreditation standards 2016 emphasised the value of leadership development. Additionally, leadership skills are an important component of many other accreditation competencies, including interprofessional collaboration, communication and patient advocacy. Pharmacy, like all healthcare careers, is team-based at its foundation. Collaboration and shared goals are paramount for effective healthcare delivery.4

The five voices tool, developed by GiANT Worldwide, is designed to help students understand their own foundational voice and better understand how to relate to and work with others. GiANT tools have been well-received by students in the past but haven't been explored as extensively in pharmacy literature compared to other personal leadership and personality inventories.

There are many unique approaches to developing leadership in PharmD students. Many of these approaches include the use of personality and leadership inventories as tools for self-reflection and understanding how to leverage one's individual skills. While various leadership inventories and tools have been discussed previously in the literature, it is important to consider not only which tools the authors use but how the authors incorporate them in this teaching.

Objectives:

• Describe the pharmacy student population in terms of the 5 Voices assessment.

• Identify the data-driven results of incorporating 5 Voices into a curriculum.

• Share incorporation of the 5 Voices in the curriculum.

Methods: The 5 Voices tool, developed by GiANT Worldwide was incorporated into the leadership curriculum across two colleges of pharmacies. The assessment took place for P2

Doctorate of Pharmacy students at a public land-grant institution during the fall semester in a two-hour elective leadership course, and a private liberal arts institution during the spring semester in a required course for all students.

Results: Responses for 456 students were included in the analysis with 159 (34.9%) and 297 (65.1%) coming from the public institution and private institution, respectively. The majority of pharmacy students at private and public pharmacy schools have Nurturer (49.1%) as their primary foundational voice, followed by Guardian (21.3%). Nurturer is higher than the national average (43%), and guardian is lower than the national average (30%).

Conclusion: Introducing students to the 5 Voices assessment provides an opportunity for them to gain a better understanding of what they can contribute to a team. In addition, they can gain a better appreciation of the other Voices and the value that they provide a team.

Bridging the gap: A comprehensive high school research training programme in biomedical sciences at an HBCU School of Pharmacy

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Introduction: There is persistent underrepresentation of Black, Hispanic, and Native American individuals in the biomedical workforce despite the recognised benefits of diversity. This emphasises the importance of early exposure, access to resources, mentoring networks, and comprehensive training programs in addressing these disparities. A five-year high school summer research training programme was developed at a School of Pharmacy in a Historically Black College and University (HBCU). The programme aimed to provide minority and underserved youth with hands-on training in drug discovery and biomedical sciences, partnering with local high school science teachers. Ultimately, the programme seeks to stimulate students' interest in pharmaceutical and biomedical research careers, thus enhancing workforce diversity.

Method: The MADDPR programme provided a comprehensive 2-year hands-on training in research methodology and advanced tools used in drug discovery and biomedical research for high school students. The program, conducted at a college campus, included summer camps and half-day sessions, transitioning to online offerings during the COVID-19 pandemic. Participants were recruited annually from Somerset County's High School biomedical sciences program, with approximately 25 students enrolled each year. The curriculum included modules covering drug discovery, public health, pharmacy practice, and response to pandemics. Programme evaluation included pre-and post-surveys,

comparison group analysis, and mixed-method evaluation design to assess the program's effectiveness in stimulating interest in STEM careers among participants. Data analysis involved statistical tests to compare career aspirations between participants and non-participants.

Results: The programme effectively engaged high school students in biomedical sciences and drug discovery, offering a comprehensive curriculum covering laboratory experiences, health promotion, and research. Near-peer mentoring was integral, with graduate students providing guidance and serving as role models. The programme successfully attracted racially and ethnically underrepresented students, with a focus on rural communities and those from low-income backgrounds. Student feedback consistently praised the program's relevance and educational value, with high ratings for various modules, even amidst pandemic-related adjustments. Graduate student mentors were highly regarded, contributing to students' comfort and educational experience. Teachers involved in the programme also rated it highly and found elements useful for classroom teaching. Comparison studies showed that programme participants were more likely to express interest in STEM and biomedical sciences careers compared to non-participants.

Conclusion: The programme effectively fostered interest in biomedical sciences among underrepresented high school students, offering comprehensive education and mentorship. Despite the pandemic challenges, student and teacher feedback remained consistently positive, highlighting the program's relevance and impact. Overall, the programme demonstrated its potential to bridge educational gaps and inspire future generations in biomedical research and healthcare.

A cross-sectional study on healthcare practitioners' knowledge, attitudes, and practices regarding antibiotic use and resistance in Jordan

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Background: Healthcare personnel's knowledge and experience with antibiotic usage and resistance are critical factors in developing effective educational programs. Identifying gaps in understanding among specific professional subgroups is essential for targeted interventions.

Purpose: This study aims to compare the knowledge, attitudes, and practices of different healthcare workers regarding antibiotic use and resistance in different settings in Jordan.

Methods: A descriptive cross-sectional survey was constructed based on assessments from various countries and was validated through pilot testing. Data were collected anonymously from 152 participants, including 73 doctors, 47 pharmacists/clinical pharmacists, and 20 dentists. Statistical analysis employed IBM SPSS version 25.0 and Excel software, setting the significance level at $p < 0.05$. The margin of error at 95% confidence was computed, and descriptive statistics, frequencies, percentages, and the Chi-square test were used for analysis.

Results: Significant differences were observed among healthcare providers in categories such as de-escalation of antimicrobial therapy, monitoring antimicrobial consumption, and antibiotic therapy ward rounds ($p = 0.011$, 0.034, and 0.021), respectively. Pharmacists and medical doctors demonstrated the highest knowledge of antibiotic use and resistance. Nurses exhibited heightened awareness of hand hygiene's importance in infection prevention, while pharmacists acknowledged their pivotal role as advisors on prudent antibiotic use.

Conclusions: The study emphasises the variability in healthcare providers' knowledge, attitudes, and behaviours related to antibiotics. Tailored educational programs and training interventions are recommended to address specific professional needs. Clinical pharmacists can play a crucial role as drug experts in medical teams, contributing significantly to mitigating antimicrobial resistance. The findings underscore the importance of targeted interventions to enhance the efficiency of healthcare professionals in managing antibiotic use and resistance.

Enhancing health literacy in clinical pharmacy education: A comparative study of problem-based learning and conventional methods

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Background: With the evolving healthcare landscape, clinical pharmacy education emphasises the significance of health literacy in preparing Pharm.D. students for patient-centered care. This study compares the effectiveness of Problem-Based Learning (PBL) and Conventional teaching methods in enhancing health literacy among third-year Pharm.D. students.

Methods: 96 Pharm.D. students are divided into two groups: 48 in the PBL group and 48 in the Conventional group. Utilising rubrics designed for assessment and Objective Structured Clinical Examination (OSCE) sessions, the study evaluates outcomes related to health literacy skills development. Additionally, student satisfaction surveys capture perceptions of the instructional methods.

Results: Preliminary findings suggest that Problem-Based Learning demonstrates superiority in enhancing health literacy skills compared to Conventional teaching (*$P < 0.05$). PBL fosters critical thinking, patient communication, and evidence-based practice competencies more effectively. Rubric-based assessments and OSCE sessions offer detailed insights into student performance, confirming the advantages of PBL. Student satisfaction surveys also indicate higher engagement and preference for PBL over Conventional methods.

Conclusion: This study underscores the superiority of Problem-Based Learning in cultivating health literacy skills among third-year Pharm.D. students in clinical pharmacy education. The findings highlight the efficacy of PBL in promoting critical thinking, patient communication, and evidence-based practice, as well as the importance of utilising rubric assessments and OSCE sessions for comprehensive evaluation. Integrating PBL into pharmacy curricula can optimise health literacy education and better prepare future pharmacy professionals for patient-centred care.

OSCEs and clinical competence in ambulatory direct patient care experiential education

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Background: Objective structured clinical examinations (OSCEs) are a widely utilised assessment tool to assess observable behaviour in clinical skills. OSCEs test the clinical competence of students via observation of their performance across multiple different stations. During an OSCE, students rotate from station to station and are assessed on skills according to a structured, reliable, valid assessment tool during a specific period of time. A well-designed OSCE is utilised for its high fidelity as an assessment tool. At the University of Illinois Chicago (UIC) College of Pharmacy (COP), OSCEs were integrated into the experiential education curriculum as part of the introductory pharmacy practice experiences (IPPEs) in Fall 2022 to assess third year (P3) student pharmacist clinical competence and align assessments with the authentic work of the pharmacist in the clinical setting.

Purpose: The objective of integrating OSCEs into experiential education assessment was to measure clinical competence in third year student pharmacists.

Methods: OSCEs were integrated into a P3 Ambulatory Direct Patient Care IPPE experiential education course in Fall 2022. The OSCEs were designed to assess student pharmacists' individual competence in conducting a patient interview in a

direct patient care outpatient setting, performing medication reconciliation, collecting and identifying patient-specific factors to be considered when developing an assessment and plan, creating a pharmacotherapeutic assessment and plan for a patient considering their specific factors and utilising evidence-based medicine, and finally, composing a note that documents a patient encounter. During these OSCEs, students rotated through stations with opportunities to collect data from the electronic medical record, interview patients, complete medication reconciliations, and complete pharmacist consults, as they would in real-world clinical settings in clinics. First-time pass rates of OSCE assessments were compared with non-OSCE evaluation methods from the previous year.

Results: In 2021-2022, the pass rate for the non-OSCE final proficiency evaluation was 94.5% (154/163 P3 student pharmacists). In 2022-2023, the pass rate for the OSCE assessment was 99.4% (155/156 P3 student pharmacists).

Conclusion: When integrated into experiential education, OSCE assessments provided P3 student pharmacists in direct patient care IPPEs an opportunity to demonstrate clinical competence. When compared to non-OSCE final proficiency evaluations, student performance demonstrated a higher pass rate with OSCEs.

TILTing assessments in experiential education to promote inclusive teaching and equity

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Background: Transparency in Teaching and Learning (TILT) is a framework for promoting inclusive teaching and enhancing equity in student success. TILT may be applied to pharmacy curricula and assessments by integrating transparency and problem-centred learning. As part of TILT, educators connect how assignments and assessments in courses are relevant to students in the long run as future pharmacists. The main tenants of TILT are ensuring learned are aware of the following three elements before engaging in learning: purpose, task, and criteria. Purpose: What is the rationale behind why students are gaining knowledge of a specific topic or skill, and how will this impact their real-life pharmacy practice? Task: What are the learners expected to do, and how should they do it? Criteria: What are the criteria against which student pharmacists will be measured to demonstrate their knowledge? Educators should be explicit and transparent with the learner ahead of time (e.g. rubrics) and provide examples for success. Integrating TILT into learning has been associated with predictors of success in students, such as academic confidence and skill development awareness.

Purpose: The purpose is to apply the TILT framework to assessment in experiential education to promote equity in student pharmacist success.

Methods: The TILT framework was integrated into third-year student pharmacist (P3) Direct Patient Care Introductory Pharmacy Practice Experience (IPPE) experiential education courses. Specifically, the framework was applied to prepare students for their objective structure clinical examinations (OSCEs) at the end of the semester. Students were provided with the purpose of the OSCEs, the tasks of the OSCE stations, and the criteria for success at the beginning of the semester. Students had 12 weeks of IPPEs to practice skills needed for direct patient care and their OSCEs. During the OSCEs at the end of the semester, students were assessed on their skills with the rubrics provided at the start of the semester.

Objectives: Conduct patient interviews in a direct patient care setting.

Performing medication reconciliation.

Identifying physical and patient-specific factors is important when developing an assessment and plan.

Develop appropriate assessments and plans based on relevant subjective and objective information, taking into consideration special populations, such as geriatrics and paediatrics.

Identify and integrate socio-behavioural, socio-economic, and cultural beliefs/values, including barriers to care, when developing assessments and plans.

Independently compose and document a direct patient care encounter.

Results: The TILT framework was integrated into P3 Direct Patient Care IPPEs with 148 P3s.

Conclusion: The TILT framework is a methodology from higher education that may be applied successfully to pharmacy curricula and assessments.

From disruption to innovation through adaptation

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Background: One of the unintended consequences of the COVID-19 pandemic was the radical technological transformation in higher education. Higher education institutions had to adapt their existing models, which were

dominated by traditional teaching and learning methods, and replace them with technology-driven approaches. This disruption to the traditional teaching approach also affected health sciences education. Academic staff members had to reinvent themselves in record time and explore alternative approaches to teaching and learning to continue to deliver quality education in a new normal.

Purpose: This paper will focus on the experiences of teaching staff in adopting new approaches during and post-COVID-19, highlighting the need for change and identifying technological resources and methodologies that health science academics are using after COVID-19. In addition, academics identified elements they valued in the pre-COVID era which needed to be blended with these new technologies.

Method: This study used the Collective Memory-Work (CMW) method to obtain qualitative data from seven (5) health science academics regarding their teaching experiences in the early stages of COVID-19 and post-COVID-19. The essential CMW steps were practically applied to reflect the participants' lived experiences. QSR NUD-IST software was used for the thematic and textual analysis of the collected data.

Results: Teachers are more confident to utilise a mixed method teaching approach, often varying the approach per section/chapter. A practical example of this would be a Zoom lecture tackling the theory, a face-to-face tutorial session to go through calculation methods, a clinical/practical session to learn the skills portion and a self-study online assignment so students can engage in research around the chapter and supplement their notes and overall understanding. The entire learning loop would be closed by an assessment, either in a digital or paper-based format.

Conclusion: Teachers were subjected to a fast learning curve to upskill in order to meet the new teaching methodologies and demands. This adaptation was not obstacle-free, and several barriers and challenges emerged during this process. However, it was important to learn from this, adapt, and forge a new way forward, not merely return to pre-COVID normality.

A cross-sectional study of vaccination-related education in pharmacy programs in the Middle East

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Background: Pharmacists play pivotal roles in improving vaccination rates. However, the absence of vaccination-related undergraduate education impedes their ability for these roles.

Purpose: The study objectives were to evaluate the presence and depth of vaccination-related content within the curricula of Middle East (ME) colleges of Pharmacy, to gauge the perceived adequacy of vaccination coverage, to ascertain the pedagogical and assessment approaches used and to identify barriers and facilitators for implementation of "vaccination administration" using Consolidated Framework for Implementation Research (CFIR).

Methods: An online questionnaire was sent to a faculty representative from each of the 132 colleges of pharmacy in 14 Arabic-speaking ME countries: Bahrain, Egypt, Iraq, Kingdom of Saudi Arabia (KSA), Kuwait, Jordan, Lebanon, Oman, Palestine, Qatar, Sudan, Syria, United Arab Emirates (UAE), and Yemen.

Results: The response rate was 64.7% (89/132), with 89.9% including vaccination in their curricula. Topics that were reported to be covered by most colleges were vaccine development (n=44, 97.8%), vaccine routes of administration (n=43, 97.7%), vaccine indications (n=38, 95%), vaccine adverse reactions (n=33, 89.2%) and vaccine precautions and contraindications (n=32, 88.9%). Planning and marketing vaccination programs (n=35, 77.8%), documentation and record-keeping of vaccinations (n=33, 75.0%), and legal and regulatory issues related to vaccinations (n=32, 69.6%) were the least adequately covered topics. The most common methods used in teaching were didactic lectures (n=74, 92.5%). Fifty-three out of 87 respondents (60.9%) responded that their college does not currently teach "vaccination administration". Lack of resources, attitudes of other health professionals, and not prioritising vaccination as barriers to implementing vaccination administration.

Conclusion: There are vaccination gaps in undergraduate pharmacy curricula in the ME. Efforts need to be exerted to cover these gaps and overcome perceived barriers.

Revision of the South African Bachelor of Pharmacy qualification: Developing a curriculum outline and accreditation criteria

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Background: The South African Pharmacy Council (SAPC) has a statutory obligation in terms of the Pharmacy Act, 53 of 1974, to establish, develop, maintain and control universally acceptable standards in pharmacy education and training and to approve providers of pharmacy education and training as well as qualifications that lead to registration with itself. The SAPC implements these responsibilities by developing scopes of practice and qualifications, accrediting providers and courses, quality assuring the delivery of the programmes, and ensuring consistency and quality across learning programmes offered at the various higher education providers accredited with itself.

Purpose: The revision of the Bachelor of Pharmacy (BPharm) sought to align the qualification with the 2018 Competency Standards for Pharmacists in South Africa. The curriculum outline and programme accreditation criteria were developed based on the qualification standards for the Bachelor of Pharmacy, which were reviewed in consultation with the Council on Higher Education (CHE) and approved by the SAPC in February 2022.

Method: The curriculum outline and accreditation criteria development required the design of the process to be followed, the approval of this process by the South African Pharmacy Council Education Committee and Council, and the appointment of a task team representative of Bachelor of Pharmacy qualification providers. Informed by the qualification standards, the task team developed Exit Level Outcomes (ELOs) and Associated Assessment Criteria (AAC) on the South African National Qualifications Framework (NQF) level 8. These ELOs and AAC were cross-checked for completeness against the Competency Standards for Pharmacists in South Africa. Knowledge fields, comprising broad and detailed themes concomitant with the assessment criteria, were identified for each of the core disciplines of pharmacy.

Results: The development process yielded a curriculum outline and accreditation criteria for the BPharm qualification, structured to meet the needs of all stakeholders. Through task team workshops, the document was reviewed and validated, incorporating the feedback and recommendations of the representatives of the BPharm providers to enhance the robustness and relevance of the framework. The minimum accreditation criteria are provided but are not intended to limit the autonomy of individual institutions that are providers of the learning programme, leading to the awarding of a BPharm qualification. The Exit Level Outcomes (ELOs), Associated Assessment Criteria (AAC), and core knowledge fields for each pharmacy discipline are provided in the Curriculum Outline and Accreditation Criteria document.

Conclusion: Curriculum guideline development requires the concerted input of all providers of Bachelor of Pharmacy programmes and relevant stakeholder input to produce a cohesive curriculum framework and the minimum criteria for accreditation by the statutory body, the SAPC. Implementation of the curriculum outline and minimum programme accreditation criteria are to be tracked and monitored for effectiveness and efficiency.

Academic dishonesty in pharmacy education: a global review

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Introduction: Academic dishonesty (AD) continues to be a significant challenge in academia. Reports of AD have been described at all levels, including healthcare education. Considerable literature has described AD behaviours in medical students, dental students, nursing students, and pharmacy students are no exception.

Pharmacists are viewed as one of the most trusted professions. As such, there is concern that AD behaviours observed during formative educational years will continue to manifest in professional practitioners. The potential for harm is notable when individuals engage in these behaviours, especially in patient care, where the consequences could be serious injury or death. The purpose of this review was to describe the global incidence of AD among admitted students in pharmacy education and identify pharmacy student perceptions and incidences of AD behaviours.

Methods: A literature search was conducted using the following databases: PubMed, MEDLINE, Academic Search Complete, CINAHL, APA Psycarticles, and ERIC. Search terms used with each database were "academic integrity OR academic dishonesty OR cheating OR plagiarism" AND "pharmacy" AND "students OR education." Inclusion criteria were studies that addressed pharmacy students involved in AD, academic integrity, cheating, or plagiarism in pharmacy education. Studies were excluded if they met any of the following criteria: did not describe AD; was not written in English; described another healthcare field; or did not relate to pharmacy students.

Results: A total of 280 studies were retrieved and reviewed for inclusion. Collected studies were from several continents, including North America, Africa, Europe, Asia, and Australia. Pharmacy student admission of participation in AD behaviours ranged in studies from 10% to greater than 90%. Agreement on what constituted AD varied by surveyed students. Cheating on an exam was viewed as AD by a median of 97% of students while falsifying lab data was viewed as AD by a median of 48% of AD. Other perceptions of AD behaviours evaluated included cheating on practical assessments and borrowing or copying material from a peer with and without permission. Perceived consequences differed between surveyed pharmacy faculty and students.

Pharmacy students also reported varying levels of engagement in AD behaviours. Upwards of 10% of students admitted to cheating on an exam, whereas a median of 49% admitted to falsifying lab data. Cheating on a practical exam was acknowledged by a median of 31% of students.

Influences of AD included self-motivation, poor understanding of what constituted AD, and technological facilitation of cheating. The introduction of and access to ChatGPT and other AI systems further contributed to AD influence.

Conclusion: The available literature shows a high prevalence of AD behaviours amongst pharmacy students globally. Students consistently viewed cheating on an exam as AD to a high degree. However, perceptions regarding other AD actions were less consistently identified. Prospective interventions to mitigate AD behaviour should target minimising opportunities for AD to occur along with educational initiatives to proactively bridge potential gaps in student knowledge and understanding.

Remote doctor of pharmacy student participation in interprofessional education (IPE) courses: Perceived value and comparison with an on-campus cohort

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Background: The Center for Interprofessional Practice and Education (CIPE) on the University of Colorado Anschutz Medical Campus has a mission to prepare graduates for the collaborative interprofessional healthcare workforce. One element of the CIPE's programme is the delivery of two longitudinal courses: Interprofessional Collaborative Practice (IPCP) and Interprofessional Healthcare Ethics and Health Equity (IPHE). All students in pharmacy, medicine, dental medicine, nursing, physician assistant, and physical therapy programs are required to complete these courses through participation in synchronous and asynchronous course sessions. Students work in interprofessional teams to practice effective communication, understand similarities and differences in roles and responsibilities of different professions, and appreciate the value of collaborative practice to achieve optimal patient outcomes. The School of Pharmacy has two cohorts of students participating in IPE courses: a traditional on-campus cohort and a distance learning cohort (which includes international students) in which all coursework and team interactions are done remotely. Although on-campus students find the interdisciplinary coursework very valuable, it was not known whether the same perceived value and benefits of IPE are achieved through remote participation.

Purpose: The purpose of this evaluation was to assess the perceived value of IPE coursework for students participating in a fully remote cohort compared to students in an on-campus cohort.

Methods: All students enrolled in the two courses in 2023 completed standardised evaluations upon course

completion. The evaluations included questions on various interprofessional aspects, including course engagement, improved ability to collaborate with other health professionals, the effectiveness of interprofessional problem-solving and communication, and the perceived importance of interprofessional practice in their future work. The responses to these questions were analysed and reported collectively by all students in the course. The in-person and remote pharmacy student cohorts were extracted and summarised individually. Differences in responses were assessed using the Chi-square test, with statistical significance defined as $P < 0.05$.

Results: The in-person cohort consisted of 106 students in IPCP and 94 in IPHE, with ten remote cohort students in each course. The proportions of students responding Agree or Strongly Agree upon completion of both courses were as follows for the in-person vs. remote cohorts, respectively:

● Courses were engaging: 92% vs. 80%

● Ability to collaborate with other health professionals was improved: 94% vs. 90%

● Students felt prepared to work with other health professionals collaboratively in caring for patients: 85% vs. 100%

● Students were effectively engaged in interprofessional patient-centred and population-focused problem-solving: 97% vs 80%

● Students were effectively engaged in communicating with team members to clarify each member's responsibility in providing collaborative patient care: 97% vs. 80%

● Students felt it important to be a collaborative interprofessional team member in their future professional roles: 89% vs. 100%.

There were no statistically significant differences between the on-campus and remote cohorts.

Conclusion: Compared to students participating in an on-campus IPE program, a cohort of pharmacy students engaging fully remotely found similar value and perceived ability to work collaboratively within interprofessional teams. These results support the feasibility of delivering effective interprofessional education remotely, including for international students.

Development of a glossary for education and training: An FIP project

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Introduction: The pharmaceutical workforce comprises all those cadres who are engaged in the healthcare, provision, supply, regulation, and production of medicines and medicinal products. Segmenting the pharmaceutical workforce has traditionally been along the lines of regulated pharmacists and non-regulated pharmacy support personnel (PSP). More recently, some countries have introduced regulated education and training and registration of PSP. The development of a lexicon of terminology used globally in the initial education and training (IET) and advancement of the pharmaceutical workforce is a pragmatic approach to narrowing the gaps between different regions of the world when providing guidelines and standards for education and training.

Method: This study aims to develop a baseline lexicon of terminology currently used globally in the initial education, training, and advancement of the pharmaceutical workforce using a modified Delphi survey.

Results: An initial list of terms was created to be included in the glossary by the working group. The terms identified were deemed relevant to the field and were within the scope and purpose of the glossary. The terms were defined using existing resources, such as policy and legislative documents, that contained definitions from various countries. Where an existing definition did not exist, the project team wrote new definitions that were clear and concise. One hundred and eighty-three definitions were initially sourced or written. A first pass by the primary responsible persons was conducted to remove terms that were too general or not applicable to IET, and the list was reduced to 150 definitions. Once WHO, UNESCO, and FIP already defined terms were removed, there were 95 definitions remaining. These definitions will be reviewed through a Delphi process and revised until a 75% consensus is reached by participants.

Conclusion: Once ethics approval has been granted by the primary author's affiliated university, the Delphi rounds will proceed. Through this work, it is envisaged that a common understanding of pharmaceutical workforce development in different countries would encourage collaboration between stakeholders from different parts of the world.

Game-based learning in pharmacy education: A final-year pharmacy elective module

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Introduction: Traditional teaching methods in pharmacy education often face challenges in engaging students and promoting active learning. Game-based learning (GBL) has emerged as a promising strategy to enhance student involvement and knowledge retention. This poster introduces a module concept where final-year Bachelor of Pharmacy (BPharm) students are tasked with utilising a game development framework to create games that enhance the teaching of a specific topic within the BPharm curriculum.

Objective: The primary goal of the module was to introduce the concept of the pharmacist's role as a teacher and explore the integration of GBL into pharmacy education. Students worked in small groups to explore learning theories, a game design framework, and game elements to collaboratively create a learning game.

Methods: Final-year BPharm students attended research methodology lectures during the first semester of the year. Topic specific lectures were also conducted to introduce students to the concepts of game-based learning. Students applied a framework: mechanics (rules and systems), dynamics (interactions and behaviours), and aesthetics (emotional responses and experiences) (MDA) to game development with the aim of integrating a curriculum topic with engaging game elements to create an immersive learning experience for peers.

Results: The module was presented in 2022 and 2023 as an elective module. In total 23 student completed the module and eight games were developed by students working in groups of three or four. Game topics were determined by the students and included pharmacodynamics, asthma management, antibiotic classes, learning medicine trade names, and cardiovascular pharmacology. Both digital and non-digital approaches were adopted in applying the MDA framework. Lecturers reviewed the game concept for creativity, attractiveness, rules, knowledge gained, and instructional effectiveness. Accuracy of the content was also reviewed prior to final submission of the developed game. In addition to the final game product, students were required to submit a poster presentation and a final report.

Conclusion: The module has been an innovative approach to exploring the role of the pharmacist as a teacher with a practical outcome. In 2024 teaching development funding has been awarded to produce the games developed by students for integration into the BPharm curriculum with the ultimate aim of testing the effectiveness of the developed games in augmenting student learning.

Students' engagement in online learning system and its effect on their final grades.

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Introduction: Flipped classroom models require students to engage with course materials outside of class time. Online learning systems are increasingly being used to provide a means to deliver and monitor student engagement. The purpose of this research is to investigate the effect of time students spend reviewing course materials on an online learning system (BlackBoard® = BB) on their final grades in Fall and Spring semesters.

Method: Final grades and student engagement for students was recorded for six courses in the first semester and five courses in the second semester. The correlation between time spent on BB and the final grades was estimated for each course. Using a regression model the effect of time spent on BB on the final grades of students was estimated. The lower and upper 5 percentile of class engagement and the average grades of these groups was identified.

Results: Existing data from 185 pharmacy students enrolled in the 2022-2023 P1 year were collected de-identified and analysed. Student's engagement in each class in the Spring semester was greater (74.66 hours) than the Fall semester (59.01 hours) with a corresponding increase in the average grade performance from Fall (82.39%) to Spring (89.90%). Students engaging with coursework in the lower 5 percentile for student engagement led to failing grades in 7 of 11 courses.

Conclusion: There are correlation data between student engagement with online learning systems and course performance. Moving forward the authors intend to have student success personnel use these data to communicate the effort required to help poor performing students improve academically.

Pharmacists social determinants of health as a predictor of structural awareness: Because I see you

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Background: Structural competency is the capacity for health professionals to recognise and respond to health and illness as the downstream effects of broad social, political, and economic structures. These structures produce the conditions in the environments where people are born, live, learn, work, play, worship, and age - termed social determinants of health (SDOH). These SDOH though non-medical, are often implicated in health (functioning, quality-of-life and risks) and healthcare (access, quality, outcomes). The contribution of SDOH to health disparities and patient outcomes is widely acknowledged. Much less has been done to characterise provider SDOH; and determine their effect on delivery of structurally competent care. Differing lived experiences create blind spots to the critical upstream factors contributing to health Inequities. The purpose of this study was to determine whether pharmacists' SDOH (assessed as historical exposure) is associated with their self-assessed structural awareness.

Methods: A web-based cross-sectional survey was administered to pharmacists currently licensed to practice in Minnesota, USA. Items included demographics; social determinants (using a modified Protocol for Responding to and Assessing Patient Assets, Risks, and Experiences [PRAPARE] questionnaire); and structural awareness-related items using a modified component of the Cultural Competence Self-Assessment Questionnaire [CCSAQ]). Risk scores for respondents' SDOH and scores for structural awareness were calculated, respectively. A multiple linear regression model was used to examine the association between respondents' structural awareness and SDOH risk score, controlling for year of first licensure, primary setting of pharmacy practice, race, and gender. T-tests examined the difference in mean structural awareness scores with four stand-alone predictor variables: reliance on public transportation, insurance coverage gaps, food insecurity, and housing insecurity.

Results: One-third (33.2%) of the respondents (N=611) practiced primarily in community/retail settings, 27.2% in hospital, and 17.7% in ambulatory care. Most respondents (75.5%) had never had unmet needs for an extended period; 83% had never been without insurance for ≥ 3 months. Most respondents had never experienced food insecurity (92.8%), housing instability (85.6%) or transportation needs (92.3%) over an extended period (≥1 month). Out of the 21 possible points demonstrating exposure to SDOH, participants scored an average of 4.9 (median = 4). Of 57 possible points, participants had a mean structural awareness score of 24.5 (median = 25). SDOH risk (assessed as historical experience) was significantly associated with structural awareness (95% CI; p-value = 0.0013)

Conclusion: Respondents with lived experience of adverse SDOH were more likely to have higher structural awareness scores. This suggests that pharmacists without the lived experience of adverse SDOH, or related exposure, may not readily make the connection between structural factors and clinical presentation of disease. Pharmacy and continued education must therefore include structural competency training to enable pharmacists to recognise and contribute to addressing the root causes of health inequity in providing patient care.

Using music videos in a communications course to bridge the gap between patient experience and disease

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Introduction: The patient experience is shaped by factors beyond just disease, encompassing family, values, resources, and environment. Healthcare education often focuses on the biomedical perspective, potentially overlooking the crucial element of patient experience. Arts and humanities offer a unique avenue to explore the emotional narrative of illness, enhancing students' understanding and preparation for real-life practice. Over the past 30 years, medical education has increasingly integrated arts and humanities, proving effective in promoting social and emotional learning, developing observational skills, and fostering empathy. While the use of arts in pharmacy education is limited, studies have shown promising results. For example, interventions involving music, films, and performances have improved student empathy and understanding of patient experiences. This pilot study aims to implement a music video intervention in a pharmacy skills and communication course to assess its impact on student pharmacists' ability to empathise with the patient experience.

Objectives: Use of the arts has proven to be an effective tool in empathy development but not extensively studied within pharmacy education. The objective of this study was to implement a music video intervention within a required pharmacy communications course and evaluate the impact on students' ability to relate to the patient experience and empathy development.

Methods: First-year pharmacy students were randomised into either the control group or the music intervention group where students watched and reflected on a music video related to course content for a total of 5 weeks. All students completed a pre- and post-survey, including an attitudes and perceptions survey and the self-reported Kiersma-Chen Empathy Scale (KCES). Students were also evaluated by faculty on their empathy within a pharmacist-patient simulation at the end of the 5 weeks.

Results: One hundred and eighty-four students participated. At the completion of the study, students' self-reported ability to relate to patients' experience of pain and addiction was significantly higher within the music intervention group (p = 0.01) versus the control group. Students within the music intervention group had a higher total mean score versus the control group for both the self-reported KCES and the faculty-assessed KCES score during the pharmacist-patient simulation, however neither were statistically significant (p = 0.58 and p = 0.19, respectively).

Conclusion: The use of music videos proved to be an effective tool in enhancing student pharmacists' ability to relate to the patient experience. Further research is needed to explore ways in which empathy development can be achieved with the use of arts and how it can translate to the provision of patient care.

Reducing test anxiety: Exploring the impact of an inquiry-based stress reduction intervention on pharmacy students

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Introduction: Test anxiety, a common issue among university students, can lead to decreased academic performance and self-efficacy. While various interventions have been studied, research on addressing test anxiety in pharmacy students remains limited. Psychoeducation, relaxation therapy, music interventions, yoga, and meditation have shown promise in reducing test anxiety levels among pharmacy students. However, there has been no exploration of the use of Inquiry-Based Stress Reduction (IBSR) in this population. IBSR, based on Byron Katie's "The Work," aims to raise self-awareness and challenge perspectives through a structured process of questioning and turnarounds. Similar to cognitive behavioural therapy (CBT), IBSR focuses on cognitive distortions and internal actions. Previous studies demonstrate favourable outcomes for IBSR in reducing depression, chronic stress, and test anxiety in university students and addressing teacher burnout. Further research is needed to evaluate the optimal utilisation of IBSR in pharmacy education.

Objective: To assess test anxiety amongst pharmacy students and the impact of an Inquiry Based Stress Reduction (IBSR) technique.

Methods: Students enrolled in the Integrated Sciences Endocrine Disorders course were eligible to participate in the study. In the pre/post-test study design, participants completed the State Trait Anxiety Inventory (STAI) and a survey including attitude and perception questions. Participants were randomised in either the IBSR intervention or control group. All participants attended a 1.5-hour seminar; the intervention group learned how to use the IBSR technique, and the control group learned about an unrelated subject. Following the seminar, the intervention group submitted weekly self-reflections using the IBSR technique as it related to anxiety towards upcoming exams. All participants completed the "State", short form of the STAI, to assess anxiety at the start of two major exams.

Results: A total of 86 students completed the study. The average score on the STAI for all participants was 51 out of 80 points indicating moderate-severe anxiety. There was no significant difference between the intervention and control groups' "State" anxiety scores prior to exam 2 (p = 0.99) and exam 3 (p = 0.60). However, 67% of participants in the intervention group reported the technique helpful, 58% changed their approach to test taking and 61% changed the way they thought about themselves in general.

Conclusion: There is a high prevalence of anxiety amongst the pharmacy student population. While the IBSR intervention did not have a significant impact on anxiety prior to exams, results showed that students thought the technique to be helpful overall. Future studies should explore other interventions to manage anxiety.

Curricular analysis of the academic pharmacy programs in higher education institutions of Central America and Mexico using the FIP Good Pharmacy Education Practice document

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Background: The training of pharmacists in Central America and Mexico is far from being homogeneous; 1) The demand of the internal labour market leads universities to prepare graduates that respond to national expectations, which are not always in accordance with the skills, knowledge and competencies recognised for pharmacists by international

organisations, and, 2)Historical context of pharmaceutical education in the region, conditions curricular changes, which are more conducive to maintaining academic traditionalism.

This work reviews the academic programs for the training of pharmacists in Central America and Mexico in relation to the recommendations of Good Pharmacy Education Practice (GPEP) of the FIP, as well as analyses the processes that have influenced configure the current educational scenario of the degrees of Bachelor of Pharmacy (LF), Pharmaceutical Chemist (QF) and Pharmaceutical Chemist Biologist (QFB).

Objectives: Analyse the training of human resources in health for the Pharmacy profession in Higher Education Institutions (HEI) in Central America and Mexico using the FIP GPEP document.

Methods: Programme academic data were collected from HEI from Mexico, which offers QFB and LF, and Central America from Belize, Guatemala, El Salvador, Honduras, Nicaragua, Costa Rica and Panama, which offer LF and QF, using analysis methodology, that places its attention on the information contained in the documents, on their meaning, as well as on sources and authority. Its objective is the capture, evaluation, selection and synthesis of the underlying messages in the content of the documents. Data were analysed using a group of indicators elaborated from the GPEP of the FIP, which evaluate the academic programs with five indicators that contemplate knowledge and skills related to chemistry and pharmaceutical sciences, administration, legislation, and drug management, of what the curriculum for pharmacists should contain, according to the GPEP of the FIP.

Results: In Central America and Mexico, there are 25 and 70 academic programs identified, respectively, of which 18 and 3 comply with the international guidelines and recommendations; discrepancies were observed in the disciplinary training in the QF and QFB programs.

Conclusion: The LF is characterised by the homologation of the study plans in the countries that offer it. The authors conclude that the QF is a Latin American invention and QFB is only Mexico´s creation, which tends to be underregulated by only having regional and national comparison points.

Work experience with students and perception of the pharmacy profession

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Introduction: Pharmacy students do not have an accurate vision and perception of the profession in which they will work as pharmacists. For many pharmacy students, there is a clear disconnect between what they are being told by

pharmacy faculty members and the reality they see in their pharmacy work experiences

For pharmacy students, understanding the pharmacist role and envisioning themselves in that role supports the formation of their professional identity. Objectivity of this study is to describe pharmacy students' work experiences and activities, examine their attitudes towards their work, examine perceptions of preceptor pharmacists they worked with, and determine important issues associated with career preference.

Method: The authors analysed a written survey with third, fourth and fifth year students of the Faculty of Medicine in Podgorica, Department of Pharmacy. All analyses were done using SPSS. 150 students participated in the survey.

Results: 20% of the students answered that they already do some pharmaceutical work, 33% of them would like to have their own pharmacy, 1% of them are thinking about specialisation in Pharmacy and Biochemistry field, 5% about PhD studies and scientific research works. 50% of them would work in pharmaceutical companies because they consider it an interesting and profitable job. 13% of them would like to work with pharmaceutical and cosmetic compounding.

Conclusion: Changing the focus of practice from products and biological systems to ensuring the best drug therapy and patient safety will raise the pharmacy's level of responsibility and require philosophical, organisational, and functional changes. It will be necessary to set new practice standards, establish cooperative relationships with other healthcare professions, and determine strategies for marketing pharmaceutical care.

Does academic entitlement impact the academic culture in pharmacy education? A multi-national dual exploration from student and faculty standpoints

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Introduction: Academic Entitlement (AE) is the expectation by students to receive high grades or preferential treatment without significant effort. It implies a diminished role for personal responsibility in academic achievement, whereby students fail to recognise their role in success and consider failure a reflection of the quality of teaching or resources. AE causes students to believe that it is the instructor's responsibility to propel them through learning, cater their

needs, offer extra assistance, and make special accommodations. The consequences of AE on students include uncivil behaviours and academic issues related to engagement and integrity. For faculty, AE impacts emotional reactions, including stress, anxiety, and the ability to perform properly, ultimately affecting the quality of education. The current study aims to investigate AE among pharmacy students in ten Arab countries, explore the experiences of pharmacy faculty with AE, and analyse associated factors.

Method: Two cross-sectional, self-administered, electronic, anonymous surveys were used to explore AE, one directed to pharmacy students and another to pharmacy faculty. Besides demographic data, the surveys used a 17-item AE measure reflecting seven AE components from both student's and faculty's perspectives. Also, students' professional behaviours and faculty perceptions, perceived reasons for AE, and common complaints and communication issues heard from students were collected. Descriptive statistics were used, and multiple linear regression was used to measure associations between different predictors and AE.

Results: A total of 2386 students and 345 faculty responses were collected. Students reported an agreeable AE attitude in 4 components: reward for efforts, customer orientation, customer service expectation, and general academic entitlement. In accommodation, a neutral attitude was reported, while they reported a disagreeing attitude in the responsibility avoidance component. In multiple linear regression, professionalism, grade point average, and year of study had a significant negative association with student AE. Among faculty, perceptions of AE had moderate levels, and the highest scores were for customer service expectation and responsibility avoidance, while the lowest was for grade haggling. In multiple linear regression, AE showed a significant positive association between faculty in clinical pharmacy departments and those having fewer years of experience. The most common complaints heard by faculty were students' requests to turn in assignments late, while the most common communication issues faculty faced with students were unprofessional verbal communication and unprofessional messages on social media. Poor admission criteria and the existence of multiple options among private colleges of pharmacy were the most common faculty-perceived reasons for AE among their students.

Conclusion: Among pharmacy students, AE scores were high and negatively associated with professionalism, while pharmacy faculty perceptions of AE showed moderate experiences. From a dual viewpoint of pharmacy students and faculty, the study calls for pharmacy programs to consider the effects of AE on pharmacy education and to pursue further investigations. The study paves the way for dialogue between faculty and students as well as between faculty and leadership about expectations in pharmacy education. Additionally, decision-makers need to be aware of AE among students and work to minimise such behaviour to positively impact student-faculty relationships.

Gamification in pharmacy education: What we did and learned in this pilot project

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Introduction: Gamification, also known as serious games, has been shown to facilitate user engagement and knowledge retention in education; however, it remains relatively unexplored in pharmacy education. This project is aimed to share the development, implementation, and evaluation of serious games in a patient safety course in an undergraduate pharmacy program. The authors adopted Kern's six-step approach to curriculum development to identify the needs perceived by pharmacy students who have previously taken the patient safety course. There were three topics that past students perceived to be the most challenging and that they would appreciate further learning support and reinforcement. Pre- and post-intervention/Safety Games evaluation questionnaires were developed and informed by Kirkpatrick's Four-Level Training Evaluation Framework.

Methods: A literature review of user experience (UX) elements was conducted on databases MEDLINE, JSTOR, Web of Science, and IEEE Xplore. A needs assessment survey was disseminated to previous students in the course for topics and safety competency domains most needing knowledge reinforcement. Subsequently, a series of educational games were developed and implemented in the Winter 2023 offering of the course, accompanied by pre-and post-intervention/Safety Games evaluation of students' knowledge and experience with the games.

Results: This literature review identified six UX elements: ease of use, clarity and affordance, realism and authenticity, feedback mechanism, competition and points system, and complexity and challenge. The needs assessment showed root cause analysis, failure mode and effects analysis, multi-incident analysis, and competency domains on safety, risk, and quality improvement needed the most knowledge reinforcement. The authors developed the Safety Games, which consist of two mini-games on the above topics. Knowledge assessment scores increased by 23.4% ($p = 0.0027$, 95% CI [20.6, 26.3]) post-intervention. Students reported the games allowed them to better recall and reflect on acquired knowledge, identify existing gaps, and reinforce skills.

Conclusion: The authors identified several UX elements for designing engaging games, and patient safety topics that may benefit from knowledge reinforcement. These Safety Games attained positive reaction/satisfaction and learning/knowledge reinforcement in learners. This pilot project provided us with an opportunity to identify challenging topics in teaching and learning of patient safety,

implement gamification in pharmacy education, and confirm user engagement and knowledge retention potential of gamification in pharmacy education. It was a successful proof of concept in using gamification in pharmacy education.

Bridging the gap between pharmaceutical sciences, pharmacy practice and economics - Experience with interdisciplinary lectures on transformative innovation

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Introduction: The COVID-19 pandemic and its profound impact on healthcare have provoked a need to enrich and adapt the interdisciplinary curricula of Innovation in Biopharmaceutical Industry, Biopharmaceutical Economics and Innovation in the Biopharmaceutical Business. This adaptation aims to prepare students with a forward-thinking mindset and the essential knowledge and skills for them to navigate the evolving landscape of healthcare.

Aim: The aim of this activity is to integrate concepts from economics and pharmacy practice/pharmaceutical sciences to enhance students' understanding of healthcare innovation (students from economics, public health, biotechnology, pharmacy, and applied biology) and prepare them for their future roles in healthcare.

Method: Principles from economics, pharmacy practice, and pharmaceutical sciences were combined. Models in economics and insights into the entire lifecycle management process of innovative drugs and the dynamics of pharmaceutical markets were explained and applied. Students developed business models in healthcare systems for both industry and pharmacies. Additionally, lectures covered topics such as vaccine development, pandemic governance, and healthcare system preparedness. Concepts such as Planetary Health, community health assessments, UN Sustainable Development Goals (SDGs) and the International Pharmaceutical Federation (FIP)

Development Goals were also discussed to prepare students to contribute to healthcare innovation and improve patient outcomes. The courses were created by a portfolio pharmacist (biopharmaceutical industry expert and community pharmacist). Since 2014 they were delivered at a German university and a state university of applied sciences (dual system). Students reflected the courses by feedback surveys and by writing on their explorative learning experience.

Results: The integration of economics and pharmacy practice and pharmaceutical sciences facilitated a good understanding of the transformation and culture of innovation within both fields. Students developed insights into the need to bridge the gap between pharmaceutical sciences, pharmacy practice and economics. Students also developed an understanding of stakeholders' responsibilities within healthcare and associated challenges such as market failure, drug shortages, and access to healthcare. Further, students were introduced to the shift towards a patient- and person-centric pharmacy practice and the pivotal role of healthcare providers, particularly pharmacists and pharmaceutical scientists, in healthcare systems. All this was supported by students' reflection papers at the end of the courses.

Conclusion: Bridging the gap between economics and pharmaceutical sciences/pharmacy practice is important for contemporary healthcare education and in transformative times, as well as preparing students for their pivotal role in healthcare systems through a more comprehensive understanding of various phenomena in healthcare and healthcare systems. Furthermore, the spread of interdisciplinary curricula and CPD programs represents an investment in human capital, capable of strengthening the healthcare workforce and enhancing accessibility to healthcare.

Assessing pharmacy student's perceptions on the redesigned foundations of pharmacology course: A qualitative study

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Background: The teaching of pharmacology concepts occurs in undergraduate medical health curricula worldwide. In pharmacy, a thorough understanding of these concepts is required for effective treatment of diseases and to allow students to gain deep insight into how medications work inside the human body. In preparation for practice, it is critical that all pharmacy students receive adequate teaching of core pharmacological concepts, which they will build upon throughout their undergraduate education. At the College of Pharmacy at Qatar University, students are exposed to a variety of concepts that play an important role in their understanding of drugs and diseases throughout their undergraduate and postgraduate pharmacy years. These pharmacy students are introduced to the foundations of pharmacology in their first professional year as a standalone course. The concepts are then integrated into the modular curriculum as they progress throughout their pharmacy degree

Purpose: There is an interest to assess whether the switch in the syllabus to the basics of pharmacology in professional year one enhanced student understanding of pharmacology

as part of the Drugs, Disease and Management (DMM) course taken in professional year 2. The authors hypothesise that teaching core pharmacology concepts early in the pharmacy undergraduate curriculum can have a vital impact on students' understanding of complex drugs and diseases, which are introduced later in the curriculum.

Method: A phenomenological qualitative approach was used to gather data from professional year two students at the College of Pharmacy at Qatar University using a purposive sampling approach. Seven virtual focus groups were conducted using a pre-determined and validated interview guide with open-ended questions, including questions on students' general experience in the pharmacology course, the timing of the course, recommendations to improve delivery and changes to assist with understanding. The focus groups were audio recorded and transcribed verbatim; coding and thematic analysis were carried out for data analysis by two researchers and verified by a third for any discrepancies.

Results: Key themes which were identified from the focus group discussion include the timing of the pharmacology course within the curriculum, instructor preparedness and teaching style, content appropriateness and assessment mapping. Overall, students felt that the content of the pharmacology course helped them to prepare for the upcoming courses within the pharmacy curriculum and also aided in understanding medicinal chemistry, which was delivered one semester before.

Conclusion: The results from this study show that students perceived a positive attitude towards the foundations of the pharmacology course that was introduced to them in professional year 1. Students enjoyed the content taught within pharmacology; however, further research is required to understand the longitudinal effects of the course change.

Development and implementation of a case-based assessment for proficiency examination in experiential education

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Background: The Proficiency evaluation is an integral part of the direct patient care introductory pharmacy practice experiences (IPPEs) experiential education course for P3 student pharmacists. The assessment is designed to evaluate the clinical competence and readiness of students prior to advancing their academic growth to P4 student pharmacists. While students may have been assigned to a variety of clinical settings, the fundamental clinical skills necessary to become pharmacists remain essential. At the end of the IPPE course, students are expected to be able to conduct a patient interview, perform medication reconciliation, collect and identify patient-specific factors, create a pharmacotherapeutic assessment and plan for a patient considering their specific factors utilising evidence-based medicine, and finally, compose a note that documents a patient encounter.

At the University of Illinois Chicago (UIC) College of Pharmacy (COP), a well-designed case-based assessment incorporating an online simulated electronic medical record platform, a real-time patient interview and an online and AI-assisted grading tool for an efficient and timely evaluation process has been implemented in lieu of a chart review SOAP note format.

Purpose: The objective of developing and Implementing a case-based assessment for Proficiency Examination in Experiential Education is to enhance the student learning experience while effectively evaluating the clinical competence and readiness of students.

Method: A course coordinator team of 2 academic clinical pharmacists, one inpatient clinical pharmacist, and 1 outpatient clinical pharmacist led a working group that created the case-based assessment for the IPPE Proficiency Examination. Using evidence-based medicine, patient cases were identified with a focus on the common disease states, potential drug interactions, and drug-related problems. To provide realistic content and scenarios during the assessment, patient-specific factors, medical histories, pharmacy records, medication lists and pertinent medical information were built into the online electronic medical record platform. The developed cases were reviewed by additional clinical pharmacists for accuracy. P4 student pharmacists participating in the academic pharmacy rotation were incorporated as student reviewers. To provide a layered learning and teaching experience for P4 student pharmacists, they played the roles of patients during the medication reconciliation interview on the day of the exam. P3 pharmacist students were expected to collect data from the electronic medical record, interview patients, complete medication reconciliations, complete pharmacist consults, and document a patient encounter using the online and AI-assisted grading tools.

Results: Since 2017, the newly designed proficiency examination using a case-based assessment has been utilised for approximately 160 students each year. The ability to mimic real-world clinical settings by integrating the electronic medical record, patient interviews, and literature evaluations has enhanced students' learning activities in experiential education. Utilising the grading software, the course coordinator team was able to efficiently review 160 cases submitted by students and provide feedback timely.

Conclusion: The proficiency examination using a case-based assessment enhanced learning experiences and effectively evaluated the clinical competence and readiness of the P3 student pharmacists at the end of the IPPE course.

Assessment of adherence to COVID-19 protective measures by students in tertiary institutions in Lagos State, Nigeria

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Background: The SARS-CoV-2 virus caused the devastating COVID-19 pandemic that claimed millions of lives. To curb the spread, WHO and the Nigerian government recommended protective measures for all citizens and residents on the 30th of March 2020. Protective measures are mitigation strategies developed by the Centers for Disease Control and Prevention (CDC) and the World Health Organisation (WHO) to help reduce the spread of the virus and also to provide a way for individuals to play a role in protecting themselves from contracting the virus or from serious illness, hospitalisation, and death even after being infected with the deadly virus. Students in tertiary institutions are one of the most dynamic groups of individuals in a nation. In Nigeria, students aged 16 years can be enrolled in universities and are thus classified as young adults. A previous study showed that young adults underestimated their risk of exposure to COVID-19 by visiting crowded places while some believed that only the elderly or immunologically compromised persons can be infected.

Purpose: This study aimed to assess tertiary institution students' knowledge about COVID-19 and adherence to the COVID-19 protective measures as set out by the Nigerian government.

Method: The study was a cross-sectional survey of 384 conveniently sampled students from three purposively selected tertiary institutions in Lagos state, namely, the University of Lagos (UNILAG), Lagos State University (LASU), and Yaba College of Technology (YCT). Questionnaires were used for data collection and analysed by means of descriptive measures (frequency and percentages). Microsoft Excel and SPSS version 25 were utilised for data entry and analysis, respectively. Ethical approval was obtained from the Health Research Ethics Committee, Lagos University Teaching Hospital (LUTH), Idi-Araba, Lagos.

Results: Most of the respondents were within the age range of 16-20 years (58.1%). Female respondents, 51.8% (n=199), were slightly more than their male counterparts. The majority of the respondents were of the Yoruba ethnic group and of the Christian religion (69.8% [n=268]; 70.1% [n=269]). Respondents displayed good COVID-19 knowledge (61.2%) (UNILAG-64.8%, YCT-61.7% and LASU- 57%). Overall, the respondents had a high level of adherence to COVID-19 protective measures (85.2%) (YCT-86.7%, UNILAG-85.2% and LASU-83.6%). The major reasons for non-compliance (~23%) were lack of belief in the existence of the disease as they had

not encountered anyone with the disease and confidence in their strong immune system. Overall, the participants had a very good level of awareness of the benefits of compliance and consequences of non-compliance (89.1%) (UNILAG-93%, YCT-89.1% and LASU-85.2%).

Conclusion: This study revealed positive results, indicating good knowledge and high adherence to COVID-19 protective measures. However, areas for improvement in knowledge and practices were identified. To enhance adherence, awareness about these areas must be created and the correct measures demonstrated and monitored so that when another pandemic comes around the responses will be even better.

Envisioning health justice through photovoice: engaging health science students in structural competency

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Background: The structures in society (policies, economic systems, social hierarchies) influence inequality and poverty. These, in turn, influence health outcomes and contribute to health disparities. Health science students must be aware of the influence of these structures on health, be able to identify them and create context-sensitive solutions to address health needs. Importantly, the need for structural competency extends beyond one specific health profession, leading to opportunities for interdisciplinary collaboration to meet complex challenges. New opportunities for training health science students in health equity are needed within health education.

Purpose: To train and empower a cadre of health science students to engage in health justice practice through an immersive community-based experience.

Method: A collaborative educational course was developed to engage students in experiential-based work to enhance structural competency (i.e. understanding the social and societal structures that impact health and health outcomes), focusing specifically on immigrants in the Pittsburgh region. Participants were primarily recruited from the Global Health Area of Concentration within the School of Pharmacy and the Social Medicine Fellows programme within the School of Medicine. Large group discussions provided training on photovoice, qualitative research, community engagement, and structural competency. Pairs of students (medicine and pharmacy) were partnered with community members to conduct "neighbourhood plunges" where students and

participants walked through the participant's neighbourhood for an interview with photos and videos from the participant's perspective. After the neighbourhood plunges were conducted, students created presentations to discuss their key learning points from the interviews which were discussed over several class sessions collaboratively.

Results: A total of 18 students registered for the course in the first iteration, 8 from pharmacy and ten from medicine. Students conducted nine neighbourhood plunges with participants from different neighbourhoods in and around Pittsburgh, all originally from different countries. Consistent themes were identified by the students, including 1) the importance of having a health care home, 2) the structural draws that push participants into suburban locations with varied outcomes, 3) the need for safety and the various definitions of safety; and 4) the importance of community and family to belonging. Students effectively identified the underlying structures influencing outcomes, including racism, poverty, immigration policies, and health policies.

Conclusion: This intervention may serve as a model that may be expanded beyond pharmacy and medicine and beyond self-identified social justice advocates in future iterations. Further, this work will help to engage students in advocacy work and will lead to future interventions to improve health disparities for immigrants in this region.

Badge up! Unleashing digital accolades to amp up student research engagement

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Introduction: Developing critical thinking and effective communication skills through structured research instruction for student pharmacists is essential for advancing the profession. However, students frequently show limited involvement in research-oriented courses due to a perceived lack of direct relevance to enhancing patient care. While digital credentialing has been proven to boost students' motivation to learn, research on its impact on pharmacy students remains scarce. In this study, the authors examined the impact of conferring a digital badge within a blended learning setting on the motivation and academic performance of pharmacy students enrolled in a research elective course.

Method: This study was approved by the Samford University Institutional Review Board. This course included benchwork research, asynchronous online activities, face-to-face classes, laboratory meetings, one scientific presentation, and one written project. Pharmacy students enrolled in a Pharmaceutical Sciences research elective course during fall 2022 and fall 2023 (N=10) completed anonymous pre-and post-assessments, self-reflections after each class, and an end-of-the-course reflection. Pre- and post-assessments included six content questions, followed by a question about their confidence level to answer them. Students' experience with digital badges and their motivation to earn one was recorded.

Results: Analyses of the pre-and post-assessments revealed a strikingly significant 36% improvement in students' scores (60 vs. 81.7%; p-value=0.02). Additionally, the student's confidence level increased by 32% (p-value=0.008). According to students, leading a scientific research presentation (100%) and conducting benchwork (90%) were the two top course activities that helped them learn the most. All students successfully obtained the digital badge and felt it motivated them to complete the learning activities. Most agreed (60%) that this motivation responded to their desire to illustrate mastery of a skill they could add to their resume upon graduation. Students' reflections showed that they were able to identify ways to incorporate what they learned into future student and professional practices.

Conclusion: In conclusion, these findings indicate that the award of a digital badge is a strong motivator to improve student engagement and academic performance. This, in turn, enhances their ability to translate those skills into future professional scenarios.

Online and in-person global pharmacy programs: A comparison of learning outcomes

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Background: The University of Southern California Mann School of Pharmacy and Pharmaceutical Sciences annually hosts the International Student Summer Programme (ISSP), a well-established 4-week on-campus event. Curtailment of international travel due to pandemic restrictions led to online offerings in 2020-2021. The success of these virtual programs prompted the creation of the International Student Winter Programme (ISWP), a one-week virtual programme starting in February 2023. Although differing in delivery method and duration, both ISSP and ISWP maintain shared structural elements and learning objectives, with students engaging in a focused area of study (clinical pharmacy, pharmaceutical

sciences, or regulatory sciences) before collaborating on interdisciplinary projects with international teams of students.

Purpose: This study examined the pre- programme goals and post- programme learning outcomes in the ISSP and ISWP. Specifically, the comparative effectiveness of online versus in-person programming on promoting learning of content, teamwork, and internationalisation was assessed.

Method: Participants completed pre- and post-programme surveys, ranking ten areas by importance (from 10 to 1, where ten is the most important) that they hoped to learn in the course (pre) and felt that they had learned (post). The authors analysed the pre- and post-programme perceptions of three of these areas: learning more about my focus area (content), working with international colleagues (internationalisation), and working in a team (teamwork). The students were also asked to rank their interests (on a scale from 1 to 10) in their focus areas in the pre- and post-programme surveys. Data were analysed for ISSP 2022 (n=38 matched pre-post responses), ISSP 2023 (n=89), ISWP 2023 (n=25), and ISWP 2024 (n=20).

Results: The distribution of the ranking of the ten areas did not differ significantly in the pre-and post-programme surveys among the four programs *(P* > 0.1 by chi-square test). In the pre-survey, content learning was ranked highest for all programs, while working with international colleagues (internationalisation) and working in a team (teamwork) were ranked on average 5th and 7th, respectively. However, in the post-programme surveys, the rankings from 1st to 3rd were teamwork, internationalisation, and content learning. In an analysis of matched data, the increased appreciation of teamwork was significant (*P* < 0.05 by paired t-test) in all four programs. The only difference between the ISSPs (4 weeks, on-campus) and ISWPs (1 week, online) was found for interest in each focus area, which showed an increase in the ISWPs but a decrease in the ISSPs.

Conclusion: This study provides insights into students' goals in attending international programs and, most importantly, their effects on them. As might be expected, initial goals prioritise learning, but engagement in the programme leads to students discovering the importance of teamwork. This suggests the need for strong group-based projects as part of any program, online or in-person. While making international contacts became important, it was not as significant as teamwork. The relative importance of content learning diminished, particularly in the on-campus environment where opportunities for cultural immersion may lessen academic focus.

Gender- and age-specific differences in antibacterial resistance in Kenya

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Background: The emergence of drug-resistant bacteria and the current and predicted rise of antibacterial resistance (ABR) is a major global health challenge. One approach used in the effort to contain ABR is surveillance and tracking of ABR trends and patterns. Patterns of ABR vary with regard to different demographic factors such as age and gender. However, the differences in ABR between genders and across age groups have not been fully explored.

Objective: The purpose of this study was to investigate demographic-specific variations in the prevalence of ABR in Kenya.

Method: This was a retrospective, cross-sectional study, in which ABR surveillance data collected by Pfizer Inc were analysed using R statistical software, on a sample size of 74 clinical isolates. Descriptive statistics were used to characterise patterns of ABR through frequencies and percentages. Multivariate analyses were conducted through Fisher's exact test for count data to evaluate gender- and age-specific variations in ABR.

Results: The most frequent pathogens isolated were P. aeruginosa (27%), E. *coli* (24%), K. pneumoniae (18%) and S. aureus (16%). The overall drug resistance rate across gender, age, and antibacterial agents was 22%. Antibacterial agents with the highest resistance rates across all bacterial species were ampicillin (94.5%), trimethoprim-sulfamethoxazole (62.2%), aztreonam (49.1%), ceftaroline (48.9%), and ceftazidime (46.5%). Most bacterial species exhibited multi-drug resistance. The odds of resistance in K. pneumoniae were higher in isolates from males than females (*p* =.00139, OR=2.3). Significant differences in the distribution of ABR across age groups were observed in E. *coli* (*p* = .00489), P. aeruginosa (*p* =.0025) and K. *pneumoniae* (*p* =.00709).

Conclusions: The study found a high prevalence of pathogens commonly associated with hospital-acquired infections and multi-drug resistance, and gender and age-specific differences in ABR were observed across different bacterial species. The study addressed these research questions and emphasised the significance of ongoing surveillance and investigation of antimicrobial resistance to inform targeted public health interventions and strategies.

Evaluation of electronic health record training within a clinical capstone course and impact on advanced pharmacy practice experience readiness

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Introduction: Pharmacists require experience and expertise with electronic health records (EHR) to provide efficient and effective care to their patients. Significant variability exists in how colleges of pharmacy utilise EHRs in their curriculum. A 2017 study demonstrated only 63% of schools were using an EHR in their standard educational programming. This results in an experience gap as 99% of US hospitals use an EHR and 96% are using computerised order entry for medications.

Methods: Third year pharmacy students were trained on the EPIC® EHR during a clinical capstone course. All students enrolled in the 3rd year Clinical Capstone course received 8 hours of EPIC® training paired with 4 course activities and assessments. This included training with faculty and preceptors from the University of Colorado Hospital (UCH) on EPIC® navigation, and live, remote patient case work-up to identify pharmacotherapy interventions. An EPIC® scavenger hunt quiz and simulated patient case work-ups were utilised in addition to graded verbal case presentations. The authors evaluated preparedness to perform on advanced pharmacy practice experience (APPE) rotations that utilise EHRs for patient care. A cohort of students and preceptors at UCH were administered a survey at the end of their 6-week APPE. Outcomes measured included student perceptions of APPE readiness and UCH preceptor perceptions of APPE student performance.

Results: Seventy-three students completed an APPE rotation at UCH and responded to the survey. Sixty-nine percent of students completed an inpatient rotation and 31% completed an ambulatory care APPE. Major areas included: 29% ICU, 14% internal medicine, 8% infectious diseases, and 29% other specialties. Student EPIC® experience prior to the clinical capstone course was as follows: 10% never used, 29% used at work, and 61% used on an introductory pharmacy practice experience (IPPE). Fifty-five percent agreed or strongly agreed that EPIC training within the capstone course increased their proficiency with the EHR. Sixty-one percent of students thought the clinical capstone training adequately prepared them for their APPE EHR (24% were neutral); 67% of students 'Somewhat or strongly agreed' the EPIC experiences in the capstone course improved their ability to perform on their APPE rotation at UCH. Students desired more practice and opportunities to gain proficiency in "real world" experiences prior to APPE's. Thirty UCH preceptors completed the survey: 30% ambulatory care, 17% internal medicine, 33% ICU, and 20% other specialties. Seventy-three percent of preceptors 'somewhat or strongly agreed' that

compared to previous students, their student was more familiar with EPIC functionality. Eighty percent agreed they spent less time teaching the student how to use the EHR compared to previous years and 56% agreed their student's performance on the rotation was improved based upon their EPIC proficiency/experience prior to starting the APPE. Preceptors felt training specific to their rotation (note writing, handoff, intervention documentation, etc.) would further increase student performance if incorporated prior to APPE rotations.

Conclusions: Incorporation of a real-world EHR into a controlled classroom environment prior to clinical rotations was feasible and resulted in improved APPE readiness and student performance as perceived by both students and preceptors.

Curricular hoarding? Expert faculty consensus-based development of the mindful streamlining self-assessment tool to address content overload

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Background: With continued addition of new accreditation standards, competencies, and outcomes for pharmacy degree programs, it is imperative that educators assess their courses and streamline content whenever possible to avoid curricular overload in pharmacy coursework. Curricular overload in Doctor of Pharmacy (PharmD) programs has been a topic of discussion within the Academy since the publication of a commentary entitled "Curricular Hoarding" in 2020. Combatting curricular overload within pharmacist degree programs requires multiple approaches that address all four of the sources of overload: curriculum expansion, content overload, perceived overload, and curriculum imbalance. Faculty should review and streamline content annually. However, this process of revision and streamlining can be overwhelming. To address this, faculty at the University of the Pacific developed a self-assessment tool for faculty to appropriately streamline content within individual teaching sessions (i.e., an individual lecture, skills lab, or case discussion). The Mindful Streamlining Self-Assessment Tool (MSSAT) was developed using principles of backward design and mindfulness to address one of the four main sources of curricular hoarding: content overload in individual coursework.

Purpose: The purpose of this presentation is to describe the development process of the MSSAT using a modified Delphi approach to gain expert faculty consensus.

Methods: The MSSAT was developed by four pharmacy faculty members and one representative from the Center of Teaching and Learning at the University of the Pacific. A modified Delphi method was used to revise the MSSAT through the purposive sampling of pharmacy experts in academia who provided anonymous feedback on each iteration of the MSSAT. Participants were recruited via American Association of Colleges of Pharmacy (AACP) listservs. To be considered experts, participants were required to meet at least 3 of 7 predetermined criteria. Group consensus was attained through repeated rounds of inquiry and revision. After each round, MSSAT developers met to discuss expert feedback and made consensus-based revisions. A Net Promoter Score (NPS) was used to assess experts' support for the MSSAT, asking, "On a scale from 1-10, how likely are you to recommend the MSSAT to another faculty member?" Finally, an instructional designer provided feedback on the ease of use and clarity of the MSSAT as a standalone tool.

Results: Twenty-two experts were selected. Twenty-one had >3 years of teaching experience, 13 had received a teaching award, 19 had published at least one scholarship of teaching and learning article and 16 had been on a U.S. national committee advancing pharmacy education. Three rounds of feedback surveys were conducted. Expert-guided changes made to the MSSAT included: 1) increased clarity in wording, 2) grammatical improvements, 3) additional definitions in the glossary, 4) development of a figure to illustrate the tool, and 5) an example of applying the tool to a real lecture. The mean NPS increased from 7.5 (initial round) to 9 (final round), indicating strong support from experts.

Conclusion: A modified Delphi approach utilised for building consensus resulted in a streamlined tool with relevant examples specific to pharmacy educators.

Model-based teaching, modelling-based teaching and social media as tools for understanding pharmaceutical biotechnology

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Introduction: The understanding of Deoxyribonucleotides (DNA) chemistry, DNA synthesis and protein synthesis is the foundation for understanding pharmaceutical biotechnology and drug development. The lack of this foundation is difficult for students to understand more complex techniques such as vaccines production, cloning and gene therapy. Watson and Crick used paper and cardboard models to explain the interaction between the bases and the double helix structure of DNA. Initially, in the Department of Pharmaceutical Sciences the module Modern Technologies in Healthcare was taught to students using only theory. The students struggled to understand the text because many of them came from schools that lacked well-stocked biology laboratories that used models as part of. As an intervention 15 years ago the department sourced physical models to explain the basic building blocks of DNA but also to describe complex techniques such as polymerase chain reaction and recombinant DNA technology in COVID-19 vaccine development. The use of models has evolved from a model-based teaching approach to a modelling-based teaching approach. The difference between these approaches is that in the first, established models are used to teach, while in the second, the creation of models by students is encouraged. Furthermore, the use of social media, namely TicTok, as an assessment tool, was developed to encourage students to share their knowledge with their peers.

Purpose: Cultivate pharmacy students' understanding of biotechnology-derived pharmaceutical products using both model-based teaching (physical and computer-based models) and modelling-based teaching. Furthermore, the assessment tool used for evaluation would be social-media-based.

Method: The students (n=70) registered in the Bachelor of Pharmacy programme were all part of the study. These students were divided into six colour groups. Initially, the theoretical teaching process (using textbooks, notes, etc.) was followed, and students were assessed via short computer-based quizzes. After this, a model-based teaching approach (i.e. physical and computer-generated models) was adopted in a series of workshops, and the students were assessed again. The final assessment task was to create a TikTok showcasing models made with sweets (candy) to explain the importance of DNA in protein synthesis and, ultimately, in biotechnologically-derived pharmaceutical products. A survey was used to administer an anonymous questionnaire to determine student satisfaction with the various elements of the module.

Results: The majority of the students participated enthusiastically in the modelling-based teaching approach. The majority of the students indicated that the models helped them to grasp key concepts in both DNA, protein synthesis and biotechnology techniques and biotechnology-derived products. They also indicated that they retained the information longer and answer essay type questions better.

Conclusions: Both model-based-and-modelling-based teaching are useful tools in teaching concepts that are abstract or complex to understand. Currently, social media is used by the youth in South Africa to convey information and share knowledge. This provides an opportunity in the educational sphere to use this as an effective tool to convey accurate and factual information in a creative way to teach the pharmacists of tomorrow.

Equity-diversity-inclusion and indigenous training for pharmacy professionals and students working in and with interprofessional primary care teams

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Introduction: Team Primary Care: Training for Transformation is a Canada wide initiative seeking to enhance integrated and comprehensive primary care training for health professionals and has an overarching goal of integrating Equity, Diversity, Inclusion (EDI) and Indigenous reconciliation through all project components. To do so, it brings together an extensive network of over 100 partners to enhance the capacity of interprofessional comprehensive primary care (CPC) through practitioner professional development.

Pharmacists and pharmacy teams play an integral part in the primary care circle, yet there is a lack of pharmacy-specific EDI and Indigenous health education for pharmacy professionals and students.

Aim: The pharmacy component of Team Primary Care was to increase the number of advanced primary care-based pharmacy leaders as clinicians and educators with the knowledge, skills and capacity to provide collaborative, comprehensive care to patients as part of the patient's medical home.

To address this aim, the Indigenous Pharmacy Professionals of Canada (IPPC) and the Association of Faculties of Pharmacy of Canada were delegated to lead the EDI and Indigenous Pharmacist Training for Comprehensive Primary Care component of the project. This was achieved through the development of immersive, online, and asynchronous educational modules.

Method: The project team and collaborators were representatives of equity-deserving groups from diverse backgrounds. The content development and review process included content experts from the University of British Columbia Faculty of Pharmaceutical Sciences' PRIDE-RX team and IPPC, peer reviewers from the Black Pharmacy Professionals of Canada, and advisory members who are pharmacy professionals with disabilities and other intersecting identities.

A review of literature and existing standards was completed, including the use of a peer reviewer familiar with trauma-informed practice to support content development. Intersectional feminist, queer, and Indigenous lenses were applied to the modules as they related to the practice integration of inclusive strategies and cultural competencies for 2SLGBTQ+ and Indigenous patients.

Results: The project resulted in a 6-module series whereby outcomes for learners include increasing:

1) Understanding of health inequities, cultural safety, and humility with respect to equity-deserving and diverse patient populations.

2) Confidence in providing EDI and Indigenous health leadership and culturally responsive care through medication management services, pharmacy systems and programs, and individual practice styles.

3) Trauma-informed support by pharmacy professionals to equity-deserving groups.

Conclusion: This initiative brought together pharmacy professionals representative of equity-deserving populations to develop comprehensive and engaging content that provides the foundations for EDI and Indigenous health-related work. The next step will be evaluating the modules via feedback surveys.

Characterising LGBTQ+education interventions for pharmacy students, pharmacy residents and pharmacists

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Introduction: The lack of LGBTQ+ related curriculum in Canadian pharmacy schools can perpetuate the health inequities affecting these populations. Countless studies have iterated pharmacy students and/or pharmacists' lack of comfort or readiness to provide care to LGBTQ+ patients. Pharmacists should have knowledge of sexual orientation and gender identity and expression (SOGIE), the intersection of those identities, and understand the lived experiences and histories of the communities they serve to provide safe and inclusive care. This narrative review characterises articles that discuss LGBTQ+ topics integrated into pharmacy education.

Method: A literature search was conducted in March 2022 using CINAHL, OVID-EMBASE, and OVID-Medline. Studies on pharmacy education for students, residents or practising pharmacists were included. Editorials, reviews,

commentaries, or articles not focused on LGBTQ+ education were excluded.

Results: A total of 201 studies was found in the initial search. 13 studies were included in the review. 62% of studies focused on transgender therapeutics and care. Other topics included inclusive language and environments (e.g., pronouns), LGBTQ+ terminology, health disparities, and health screening. 11 studies utilised pharmacy students as participants, and 2 studies researched pharmacists. No studies looked at education interventions for pharmacy residents. No studies were conducted in Canada. Two-Spirit identities and health topics were not addressed in any studies.

85% of the studies utilised pre- and post-surveys to assess the benefit of the education intervention. Didactic teaching interventions were used in majority of the studies, however 4 studies included activity-based learning such as panel discussion, Jeopardy, patient-cases, and mock counselling. The inclusion of these interventions improved participants' knowledge and confidence in caring for LGBTQ+ patients.

Conclusion: Limited literature is available relating to LGBTQ+ content in pharmacy curricula, though most studies highlight the value of incorporating transgender therapeutics and care into pharmacy education. This review found both didactic and activity-based learning activities beneficial in improving students' knowledge and confidence in working with LGBTQ+ populations. A Canadian perspective on LGBTQ+ topics in pharmacy education would be of utility to existing research.

Empowering future pharmacists: The impact of an experiential learning programme in a student-run free clinic

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Background: Creating, maintaining, and enhancing a student-run free medical clinic ("the clinic") learning model can achieve multiple goals. In addition to benefits for patients and communities, this model also establishes an experiential training pipeline. Pre-graduate students who volunteer receive practical experience and mentorship. Students enrolled in the Doctor of Pharmacy curriculum receive course credit, development of leadership skills, and mentorship. The experience may also help them succeed when applying to post-graduate training programs, such as residency. Despite these advantages, student-run free clinic models associated with pharmacy programs in the United States are not prevalent for various reasons, including challenges with appropriate oversight, regulations, and funding.

Purpose: To describe the structure and advantages of the experiential learning programme developed in the clinic, including the number of students who participated and the percentage that obtained competitive post-graduate training positions

Methods: All pharmacy students at the University of California San Diego (UCSD) Skaggs School of Pharmacy and Pharmaceutical Sciences (SSPPS) who held a structured position in the clinic were compiled for graduating classes of 2020 through 2023. Successful applications to post-graduate positions (defined as either an accredited post-graduate year one (PGY1) pharmacy residency programme or fellowship) were quantified. For the class of 2020, successful applications were compared between students who held a position in the clinic and those who did not use the chi-square test for independence. The advantages of the learning model were also summarised based on the author's experiences as a pharmacy director.

Results: Student participation in the clinic for the classes of 2020, 2021, 2022, and 2023 was 30%, 24%, 30%, and 42%, respectively. Of those who participated and applied to post-graduate training programs, 93%, 100%, 88%, and 90% achieved successful placement. For the class of 2020, students who participated were more likely to succeed in obtaining a post-graduate programme when compared with students who did not participate (χ^2 (1, n=39) = 9.05, $p < 0.01$). Advantages for undergraduate students include hands-on experience in a pharmacy setting, the ability to interact with current pharmacy students, and access to mentorship from pharmacists. Additional advantages for pharmacy students include providing care to underserved communities and obtaining course credit. Advantages to the institution include increasing awareness for the pharmacy profession and strengthening community partnerships and outreach programs for diverse patient populations.

Conclusion: There are immense advantages to the experiential learning programme at the UCSD student-run free clinic, including success in facilitating post-graduate training placements. With strong student engagement over the studied period and consistently high placement rates, the programme offers valuable hands-on experience, mentorship opportunities, and community outreach benefits, highlighting its efficacy in preparing students for successful pharmacy careers.

Establishing a strategic international partnership between two schools of pharmacy in the United States and the United Kingdom

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Background: Patient care is increasingly influenced by cultural diversity and global health challenges. While acknowledged by pharmacy educators, these curricula remain country-centric and focus on local health issues and practice initiatives. However, in a world that is increasingly connected, students and faculty members benefit from initiatives that promote awareness and understanding of new perspectives and transcultural competence.

Purpose: The objectives of this project were to 1) initiate a collaboration with an international school of pharmacy; 2) distinguish the nuanced cultural and educational differences in pharmacy education, practice and regulatory standards across the countries; and 3) design an interactive project between these students.

Methods: Representatives from the schools of pharmacy at Cardiff University (CU) and the University of Wyoming (UW) met regularly over video-conferencing technology to become acquainted, explore differences in pharmacy education and pharmacy practice between the two countries, and exchange pedagogical expertise. In addition, each programme discussed areas where the growth of knowledge and skills was desired for their respective students. Through grant funding, representatives from each pharmacy school participated in a one-week exchange at the collaborating school. This exchange provided a more in-depth analysis of educational models such as simulation, labs, and clinical placements/rotations. In addition, the review of practice sites in each country enhanced knowledge and appreciation of different practice models.

Results: Faculty networking and exchange of ideas led to synergistic curricular changes that enhanced knowledge, skills, and cultural competence for both countries' student cohorts. Both programs identified clinical decision-making and cultural competence as areas of growth for students. As pharmacists are evolving into expanded roles in both countries, current curricula provide insufficient repetition for students to work through complex cases. Students must also be aware of cultural nuances that can influence health decisions and outcomes. To address these needs, CU and UW have developed patient cases in an online virtual medical education tool to allow students expanded practice in solving complex patient scenarios. These cases are embedded in a six-week Collaborative Online International Learning (COIL) module to allow students to engage with and solve cases with international peers.

Conclusion: This project enabled CU and UW to develop collaborative teaching, professional services and research projects with deliverable outcomes and a clear pathway to build and sustain future collaboration. Both institutions developed a milieu rich for the longitudinal exchange of best practices in teaching, learning and assessment in and out of the classroom. The project also scoped opportunities for international didactic and clinical training/rotation sites for each school by meeting relevant stakeholders such as corporate and public health service partners. These exchanges and activities have built an international community of practice that is aligned with strategic plans for internationalisation at each institution, enhanced the reputation of both schools, and supported student and faculty recruitment.

Qualitative study exploring undergraduate pharmacy student perceptions of applied health research

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Introduction: Applied health research (AHR) aims to solve 'real-world' problems and develop evidence-based, cost-effective methods of healthcare delivery. The organisations worldwide such as National Institute for Health Research (NIHR) aim to develop a highly-skilled workforce, capable of advancing research to improve individual patient care and population health outcomes. Although a cornerstone of pledges set out in the NHS Constitution, evidence shows pharmacists' participation in research is limited. Inspiring student pharmacists to engage in research could create a foundation for improved research engagement across the pharmacy career trajectory and help to build the future clinical academic workforce.

Purpose: To explore undergraduate student pharmacists' perceptions of AHR.

Method: One-to-one, qualitative interviews were conducted with a convenience sample of final-year student pharmacists from across the UK (Aston, Liverpool John Moores, Nottingham, Newcastle, Bath, Cardiff, Medway, Portsmouth, de Montfort Universities). Participants were recruited via

email, which included a consent form and participant information sheet. Interviews used a topic guide with questions identified in the literature. The interviews were conducted by one of four student researchers recruited from each university until data saturation was reached. Videoconferencing software (Teams/Zoom) was used to conduct and record interviews which were automatically transcribed. Thematic analysis, a standard technique, was used to analyse the data: students coded the data with support from the academic supervisors.

Results: Fifty-three interviews were conducted. All were included in the analysis. Four themes were identified, including 1) understanding of AHR, 2) experiences of AHR, 3) interest in conducting AHR, and 4) raising awareness of AHR. Whilst mixed responses were seen, understanding of AHR and its importance was poor, with many students only aware of pharmaceutical or clinical trials research. Additionally, participants struggled to identify the inherent value of AHR in pharmacy careers in some sectors, such as community or retail pharmacy, where the majority of pharmacists work.

Conclusion: Overall data shows that student pharmacists were far from being 'research-ready' and were concerned about the disparity between AHR in different pharmacy sectors. A limitation of the study is convenience sampling, which means participants may have had existing relationships with researchers, which could have influenced what was said. A strength of the study is the sample pooled data from different Universities, strengthening the transferability of the findings. Further work is needed to establish clearer links to AHR, NIHR and the NHS Constitution in student pharmacist education.

Enhancing pharmacy education through a hospital environment discovery room: A novel approach

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Background: As part of a broader modernisation initiative within this pharmacy program, the authors introduced a Hospital environment discovery room. This innovative addition aims to develop and consolidate skills related to the expanded scope of practice and to adapt pharmacy education to contemporary practice. The discovery room fosters a comprehensive understanding of hospital pharmacy dynamics, preparing students for their clinical rotations and beyond.

Purpose: This primary objective is to enhance student readiness for hospital clinical rotations through experiential learning in a simulated environment. The authors aim to familiarise students with hospital settings, introduce them to diverse information sources, and clarify the role of hospital pharmacists.

Methods: The process involved thorough planning, including the design of a dedicated space mimicking a nursing station and a patient room with relevant furniture and technology. The formation of a multidisciplinary team was paramount to the success of the project. Subsequent steps encompassed brainstorming sessions to delineate the characteristics of activities within the discovery room. Tools crucial to the success of the discovery room included the development of patients' files in paper and electronic formats, nurse Kardex, vital signs charts, hospital intranet, and a simulated Dossier santé Québec.

To discover these information sources, a comprehensive questionnaire using H5P was created and incorporated into the Moodle platform. Additionally, the authors integrated videos featuring questions from members of the healthcare team into the questionnaire. This activity includes team exercises in the discovery room with interactive questionnaires providing rapid feedback.

This first activity was tested by voluntary students, leading to adjustments based on their comments. Further activities will involve conducting a comparative medication review, writing progress notes using SOAP format, and preparing discharge prescriptions and transfer forms.

Results: Initial assessment of student engagement and learning outcomes revealed promising results. Of the 140 students who completed the questionnaire (out of 179 participants), 94 % totally agreed or agreed that they deemed themselves able to name the main sources of information available in a hospital setting at the end of the activity. Seventy-nine percent totally agreed or agreed that they were able to describe the contents and the limits of those sources after completing the activity. Finally, 66 % of the students totally agreed or agreed that they feel confident in finding the patient information they need in the sources available in hospitals.

Conclusion: This innovative pedagogical approach combines autonomy and staged feedback, offering students a hands-on learning experience prior to their hospital clerkships. Since January 2024, the first part of these activities has been integrated into the second year of the pharmacy program. In addition to the discussion on the structured journey from conception to implementation, this presentation will report students' feedback on their experience.

Evaluating the impact of a 20-year academic leadership programme

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Introduction: Health profession educators face many challenges that require multiple layers of talented leadership. This recognition stimulated the development of the American Association of Colleges of Pharmacy (AACP) Academic Leadership Fellows Programme (ALFP) in 2004. To date, 20 cohorts, each consisting of approximately 30 fellows, have completed the longitudinal leadership programme annually.

Purpose: This project is to evaluate the impact of ALFP on participants, their institution, AACP, and the pharmacy profession. The hypothesis is that the leadership progression of fellows and their evaluation of the impact of the programme on them professionally will provide evidence of overall programme impact.

Method: A survey was developed and piloted with four cohorts of programme participants and then administered to all other cohorts that have completed the program. The survey sought information about career advancement, engagement in AACP and other pharmacy/scientific organisations, and statements of how the programme impacted each respondent. The analysis included both quantitative and qualitative methods.

Results: Two hundred ninety-five of 551 (53.5%) responded to the survey. The data revealed that over 83% of respondents said the impact on their careers was significant. 94% indicated that the programme increased their confidence in their leadership abilities. Many had been promoted at either their sponsoring institution and/or another college of pharmacy. 96% have recommended participation in the programme to colleagues. Four areas noted as the greatest impact of the programme gleaned from open-ended responses were knowledge/skills, networks, confidence, and advancement.

Conclusion: This analysis substantiates that participation in ALFP has a significant and positive impact on a high percentage of fellows. Additional quantitative and qualitative results of the analysis will be included in the presentation.

Exploring the validity of tutor-compiled progress reports in assessing pharmacist interns during the South African Pharmacist Internship Programme: Perspective of interns and tutors

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Background: Prior to registering as entry-level pharmacists in South Africa, all BPharm graduates must complete a 12-month internship and successfully complete three assessments, namely an electronic portfolio of evidence, a pre-registration examination, and a tutor-compiled progress report. Grounded in Kane's framework, Validity as a Structured Argument, this paper reports on the perceptions of interns and tutors on the validity of the tutor-compiled progress report. The research question was: How do pharmacist interns and tutors perceive the validity of the tutor-compiled progress report to assess the competency of pharmacist interns during the internship period?

Method: During 2023, a cross-sectional survey was conducted using a self-administered online questionnaire. The study population included all 2023 registered pharmacist interns (N=853) and tutors (N=4395). Additionally, thirty-five purposively selected documents were thematically analysed. Findings from the survey and the document analysis were interpreted to derive meaningful insights and explore relationships within the data.

Results: A total of 44 pharmacist interns and 37 tutors, respectively, responded. Contrary to the document analysis, most tutors (70%, n=26) indicated a lack of training to assess the progress of pharmacist interns and indicated difficulty in using the assessment rubrics (83%, n=30). On the contrary, 59% (n=26) of pharmacist interns indicated the training was sufficient, supporting findings from the document analysis. Both tutors and interns questioned the validity of the assessment rubric, with 50% of tutors and 41% (n=18) of interns indicating that the rubric does not adequately differentiate competency levels. Furthermore, 37% (n=13) of tutors and 39% (n=17) of interns view the tutor-compiled progress report as inadequate to assess competency. Findings from document analysis support these views and show a need for alignment with the competency standards.

Conclusion: Survey results and the document analysis reveal discrepancies between the tutors' and interns' perceptions regarding the adequacy of the training, the usability of the

tutor progress reports, and the assessment rubric to assess competency.

A systematic literature review of immunisation administration training for African pharmacists and student pharmacists

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Objective: The objective of this research is to describe published literature regarding immunisation administration training for pharmacists and student pharmacists in Africa.

Methods: A systematic literature review was conducted utilising methods from the Cochrane Handbook for Systematic Reviews and the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) reporting guidelines. Articles found in PubMed, Cochrane Central Register of Controlled Trials (CENTRAL), Cumulative Index to Nursing and Allied Health Literature (CINAHL), Web of Science, Embase, and Medline were reviewed for eligibility based on several criteria. The following inclusion criteria were used: involving pharmacy personnel, namely pharmacists or student pharmacists; involving immunisation administration, not just immunology or vaccinology education; involving education or training; and involving pharmacists or student pharmacists in Africa.

Results: Nine-hundred and forty articles were identified from six databases and grey literature. After eligibility criteria were applied, a total of eight studies from seven African countries were included, representing the Democratic Republic of Congo, Ethiopia, Nigeria, Senegal, South Africa, Uganda, and Zimbabwe. Three studies described immunisation administration training programs for pharmacists, and one described training for student pharmacists. Studies identified that the limited educational opportunities may be related to the content covered in a Bachelor of Pharmacy (BPharm) degree, which is the most commonly available degree in the pharmacy field in Africa. Only one article included details about the topics taught during immunisation training and the format of the training and assessment. The training included a combination of online lecture videos and live in-person training. The in-person training included injection technique and anaphylaxis management with an injection technique skills assessment. Participants were also required to complete a written skills assessment and administer both intramuscular and subcutaneous injections under the supervision of a trained immuniser to be certified.

Several articles did not directly describe how training was offered but reported that there is potential in addressing vaccination gaps in low- and low-middle-income countries through training pharmacists to immunise. Lack of access to routine immunisation services is among the biggest challenges of immunising children in many African countries, and pharmacists can address this by mobilising to improve vaccination coverage. Pharmacists can also improve outreach activities by tailoring them to meet the needs and characteristics of particular communities, addressing factors such as level of literacy and education, socio-economic status, prior knowledge about immunisations, and culture.

Conclusions: There are limited publications describing immunisation training available to pharmacists and student pharmacists in Africa. Immunising pharmacists could make a meaningful impact on immunisation access in Africa, but more opportunities for training may be needed.

Performance and engagement: Potential advantages of required attendance in pharmacy education

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Introduction: Absenteeism is a problem in pharmacy education. Pharmacists are valued members of the healthcare team, and proper education and training are paramount. To combat increasing absenteeism, some pharmacy faculty require attendance in in-person classes. The impacts of required attendance vary in terms of academic performance. Data on engagement with required attendance are also sparse, and attendance remains an imperfect surrogate marker for engagement. One objective of this study was to evaluate student pharmacist examination performance in a cohort with graded attendance compared to a cohort without graded attendance in a pharmacotherapy course. Another objective was to evaluate student engagement with required attendance, identify intervals where students were most and least likely to be engaged and assess student perceptions of the importance of engagement.

Methods: Attendance was implemented as a graded component of a third-year pharmacotherapy course in Fall 2022. Performance data from students enrolled in Fall 2021 and Fall 2022 were included. Examination performance was analysed using Bloom's taxonomy and college-level learning outcomes (CLLO) question coding. For the Fall 2022 cohort, a survey instrument was developed to gauge student engagement during in-class sessions throughout the semester. Students were asked three questions regarding engagement to determine whether they were on-task, off-task related, or off-task unrelated. Weekly throughout the semester, students were randomly surveyed for a beginning, middle, and end time point. A second survey was utilised to collect perception data from students regarding attendance and engagement. The perception survey was released at the

midpoint of the semester and at the end of the semester. The student's t-test was used to compare average examination performance for specific learning objectives and overall examination performance for both cohorts. Descriptive statistics were utilised for engagement data, and the Student's t-test was used to compare means between groups. P values of 0.05 or less were considered significant, and all tests were two-tailed.

Results: One-hundred and two students completed the course examinations as scheduled in the graded attendance cohort Fall 2022 and 134 students completed scheduled examinations for the non-graded attendance Fall 2021 cohort. For Examination 1, there was a significant difference in all levels of Bloom taxonomy questions and three out of five CLLO. For Examination 2, there were significant differences in performance between both cohorts for all objectives.

The overall attendance rate for the Fall 2022 cohort was 91%. Generally, students reported being on–task when surveyed. The average weekly tasks rates were 78% on–task, 16% off–task–related, and 7% off–task–unrelated. For the perception survey, both time points had a high response rate (83%, mid-point survey, 77%, end of semester). Most students had positive perceptions regarding mandatory attendance, engagement, and pre-class preparation.

Conclusion: Student pharmacists demonstrated better academic performance when attendance was graded than a cohort without a required attendance component. This study also endorses high levels of student engagement throughout in-class sessions. Students reported positive perceptions regarding required attendance. Future investigations should include the non-performance-based benefits of attendance.

A review of global health competency frameworks across health disciplines

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Introduction: Several similar but distinct definitions and competency frameworks exist to define and teach "global health". In 2013, a report from the Global Pharmacy Education Special Interest Group of the American Association of Colleges of Pharmacy was released to connect global/international pharmacy education to the Center for the Advancement of Pharmacy Education (CAPE) 2013 outcomes. However, more work needs to be done to demonstrate alignment between global health competencies and required curricular outcomes in health professions. Assessing this alignment may help educators meet student demand for increased global health exposure and integrate global health competencies into health curriculums.

Methods: A literature search was conducted to find articles describing global health competencies in the educational fields of medicine, nursing, pharmacy, public health, and multidisciplinary. Searches were conducted through PubMed and supplemented by Google Scholar. Iterations of search terms such as "global health," "education," "core competencies," "curricular development," "learning outcomes," and discipline names were applied. A total of 20 global health competency frameworks were identified (four medical, two nursing, four pharmacy, six public health, and four multidisciplinary). All identified global health competencies were grouped into domains and defined based on existing definitions in the literature. Frequencies were calculated to represent the number of times each domain was identified within all included global health competency frameworks, as well as the number of times each domain was identified within the discipline-specific global health competency frameworks. Required curricular outcomes were extracted for each discipline from their main association or accreditation bodies. These outcomes were compared to the global health domains to identify similarities and differences.

Results: Thirteen domains were identified across the global health competency frameworks. The most commonly mentioned domains were the global burden of disease (75%), human rights and ethics (70%), and collaboration, partnering, and communication (65%). The least commonly mentioned domain was cultural competency (20%). Global health competency frameworks across medicine, nursing, and pharmacy were similar, with all frameworks mentioning the global burden of disease. More medical and nursing frameworks mentioned human rights and ethics, social determinants of health (SDOH), and globalisation of health and healthcare compared to pharmacy. When comparing these global health domains to the required curricular outcomes for each discipline, the domains of the global burden of disease, collaboration, health equity and social justice, SDOH, and cultural competency are most closely aligned for pharmacy, while research, cultural competency, human right and ethics, and collaboration most closely aligned for medicine.

Conclusion: The overlap between global health competency frameworks across disciplines can be used to develop intentional interdisciplinary collaboration in global health learning activities. The alignment between global health competencies and required curricular outcomes presents an opportunity to meet student demand for global health exposure without contributing to the growing problem of curricular hoarding. Future research should describe methods to teach required curricular outcomes using global health competencies.

Effective vaccine management training to empower frontline healthcare workers in South Africa to assess, monitor and strengthen immunisation supply chain performance

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Background: Successful vaccination at the grassroots level depends on multiple factors to ensure the correct vaccine is administered at the right cost, time and place. Some of these include a complex immunisation supply chain and acceptable conduct in handling and administering vaccines at the health facility level. Effective Vaccine Management (EVM) provides the tools and materials necessary to monitor and assess the vaccine supply chain and subsequently improve immunisation supply chain performance.

Purpose: To develop training materials to equip frontline healthcare workers (vaccinators, pharmacists, pharmacist assistants, depot personnel) responsible for the management of vaccines in public and private sectors, with knowledge and guidance on good EVM practices, in compliance with South African (SA) legislation for vaccine logistics and supply.

Method: Following a needs assessment, the SA Vaccination and Immunisation Centre developed EVM training materials with input from the Expanded Programme on Immunisation (EPI) and UNICEF. Ten modules were developed, each consisting of four parts, completed in sequence: 1) Pre-module quiz with multiple-choice questions (MCQs); 2) Training materials including a learner guide with instructions, lecture video presented as a PowerPoint® slide deck with voice recording, transcript corresponding to the voice recording of the lecture video, folder with resources and a case study with questions; 3) Post-module assessment with MCQs; 4) Module evaluation. Training materials were pilot-tested among key personnel in all provinces to confirm that the contents are aligned with provincial standard operating procedures and practices. Attendees included Provincial Cold Chain Managers, EPI Managers, Pharmaceutical Services Representatives, and District EPI Coordinators.

Results: The pilot test showed improvement in pre-post MCQ scores, demonstrating that the training materials effectively enhanced existing knowledge and contributed to a deeper understanding of EVM. The final EVM course consists of 10 modules: 1) Introduction to effective vaccine management; 2) Principles for optimal vaccine potency and stability; 3) Vaccine estimation and funding; 4) Vaccine arrival and inventory management systems; 5) Storage capacity, buildings and maintenance; 6) Cold chain equipment and contingency planning; 7) Distribution and transport capacity; 8) Waste management and disposal; 9) Programme management and supportive supervision; 10) Quality improvement planning. All modules are available through the NDoH's Knowledge Hub, accessible from anywhere with internet access and zero-rated. Modules are accredited by the Health Professions Council of SA, with 20 CPD points earned when all modules are completed. In addition, EVM job aids (desk-top flip charts and posters) were developed, covering important aspects of all modules to aid point-of-care decision-making for frontline workers.

Conclusion: EVM is a national EPI planning process that assesses and prioritises improvements in the immunisation supply chain. It is embedded within the immunisation supply chain continuous improvement planning process and sets the performance standards for supply chain strengthening; hence, it is important to ensure that EVM principles are implemented at all levels of the immunisation supply chain. This EVM training will allow vaccine distribution sites and health facilities to identify shortcomings in the immunisation supply chain with the aim of developing improvement plans that will address gaps before the next EVM assessment is conducted.

Blue-green-red-yellow: Relating Whole Brain® preferences of student pharmacists and preceptors participating in an international advanced pharmacy practice experience in London, England

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Introduction: Student pharmacists participating in international Advanced Pharmacy Practice Experiences (I-APPE) encounter different communication and problem-solving styles. The Whole Brain® Thinking Model was developed to assess cognitive diversity, allowing users, teams, and organisations to establish a culture of acceptance. This activity was designed to develop introspective awareness of thought preferences and how to utilise these preferences during I-APPEs.

Methods: In preparation for their I-APPE, student pharmacists complete pre-departure coursework, which includes intercultural learning, local culture, travel preparation, and pharmacy practice. As part of this groundwork, students complete the Hermann Brain Dominance Inventory® (HBDI), a 116-question online survey which evaluates thinking preferences. The HBDI focuses on four quadrants of thinking, characterised by colour: blue (quantitative, fact-based, analytical), green (organised, sequential, detailed), red (interpersonal, feelings-based, emotional), and yellow (synthesising, integrating, intuitive). Participants receive a profile score for each quadrant, and the higher the score, the more dominant an individual's preference for that quadrant. Students were debriefed on their HBDI and participated in in-class activities to apply preferences in different pharmacy practice settings. Meanwhile, their preceptors at St. Bartholomew's Hospital in London, England, also completed the assessment as part of a staff development workshop.

Results: A total of 56 student pharmacists completing an I-APPE at St. Bartholomew's Hospital completed the HBDI and discussion from 2021-2024. Most students preferred thinking in the green quadrant (n=39, average score = 78), followed by the yellow quadrant (n=38, average score = 72), blue quadrant (n= 31, average score = 69) and red quadrant (n=27, average score = 67). While under pressure, there was an increase in green, blue, and red quadrant preferences and a decrease in yellow. The most common preference code was 1-1-1-2 (n=11), which aligns with high preferences for blue, green, and yellow.

A total of 25 I-APPE preceptors took the HBDI in 2024. Most preceptors had their highest score in the blue quadrant (n=9, average score 72.5). The average score for the green quadrant was the overall highest but had the least number of highest scores out of a preceptor's profile (n=5, average score = 72.8). After these two, the most preferred thinking style was in the red quadrant (n=6, average score = 70), followed by yellow (n=6, average score = 62). Again, under pressure, the scores shifted toward green, blue, and red. The most common preference code for this group was also 1-1-2-2 (n=6).

Conclusion: Students and preceptors completing the HBDI were able to gain self-awareness, which can espouse belonging and support within their I-APPE site. This information will be used to create both introspective and collaborative learning experiences that will help both the student and preceptor maximise the use of their individual thought differences. Analysis of this information can also help to compare the intercultural effect on differences in thinking style between student pharmacists from the United States and their preceptors in London.

Evaluating social determinants of health content in didactic courses within a PharmD curriculum

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Introduction: Doctor of Pharmacy accreditation standards continue to advocate for the integration of whole-person care instruction, which is challenging colleges of pharmacy to include concepts that influence how patients take medications. With this continued emphasis, more focus is also being placed on developing health equity-minded student pharmacists, which requires longitudinal curricular integration of social determinants of health (SDOH). There is currently data lacking about the student perceptions around this integrated information, and it is not possible to identify individual curricular gaps. To address this gap in the literature and assist in enhancing an individual curriculum, Purdue College of Pharmacy evaluated students' perceived incorporation of SDOH concepts in didactic therapeutic courses.

Methods: This was an observational study that evaluated the included SDOH concepts in the didactic curriculum (integrated pharmacotherapy, professional skills laboratories, and other core courses) during the 2021-2022 school year. Two trained students from each professional class (P1, P2, P3) completed a standard survey to collect SDOH content included in every lecture taught during the Fall and Spring semesters. The SDOH concepts evaluated were race, gender, sexual orientation, access to care, language/health literacy, neighbourhood/built environment, socioeconomic status, and other vulnerable populations. Data was included for review if both students submitted a survey for the same lecture; this helped ensure one person's response wasn't too heavily weighted. Outcomes were analysed using descriptive statistics, including SDOH concept frequency and type included in lectures and throughout the overall core course sequence, which spans P1-P3. Additionally, students rated on a scale from 1-5 whether or not they believed discussing any SDOH concept was relevant to the lecture.

Results: Overall, there were a total of 756 responses collected across 12 courses. Of these, 192 responses were removed due to a missing paired response. This left 564 remaining responses or 282 individual lectures that were evaluated. Students surveyed agreed that 31.2% of lectures included at least one SDOH concept. When reviewed by year, 38.7%(P1), 39.6%(P2) and 18%(P3) of lectures included at least one SDOH. Of the SDOH concepts analysed, "Socioeconomic Status" (7.7%), "Race" (7.3%) and "Access to Care" (10.5%) were covered most frequently. In therapeutic lectures, SDOH content was most frequently identified in epidemiology (21%), pathophysiology (21%), and therapeutics (50%). When further evaluated, epidemiology portions only included concepts of gender and race (33%). In nontherapeutic

lectures, SDOH content was most frequently identified in didactic material over all other components of lectures (61%). For lectures that included at least one SDOH topic, the rating scale data showcased that students rated the importance of it higher for lectures than for those lectures where it was not already included.

Conclusions: This study evaluated an entire Integrated Pharmacotherapy sequence for the inclusion of SDOH content. Unfortunately, a minority of lectures included any SDOH. However, this study highlights opportunities for meaningful SDOH content inclusion to foster the development of a health equity mindset in future pharmacists.

Assessing Interprofessional Educational (IPE) experiences and attitudes at each level of the IPE Curriculum

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Background: The World Health Organisation (WHO) defines interprofessional education (IPE) as the educational process wherein students from two or more professions learn about, from and with each other. In recent years, accreditation bodies overseeing health profession programs have mandated the incorporation of interprofessional education within curricular frameworks. A robust series of educational experiences was developed between student pharmacists and student physicians at this institution. The objective of this project is to describe interprofessional education (IPE) experiences for pharmacy and medicine students during the first three years of the programme and assess the attitudes of pharmacy and medical student learners at each level of the IPE curriculum.

Methods: IPE was introduced to first-year medical (M1) and pharmacy (P1) students through a 2-hour session, using large and small group discussions facilitated by two faculty from each program. The first IPE focused on the educational content of medical and pharmacy curricula and roles and responsibilities. Seated in large auditoriums, small groups of M1 and P1 students collaborated on patient cases. The Students Perceptions of Interprofessional Clinical Education Revised (SPICE-R2) survey was administered to ascertain experiences and attitudes. Next, second-year medical (M2) and pharmacy (P2) students engaged in progressive reveal patient cases in large and small group discussions. Afterwards, they self-assessed their level of proficiency in

communication, values and ethics. Based on a pilot session in the previous year, the third-year medical (M3) and pharmacy (P3) learners participated in team simulations with standardised patients (SP). The M3/P3 teams briefed together, interviewed the SP, and communicated a treatment plan. Afterwards, two M3/P3 teams debriefed with the faculty and assessed their roles and responsibilities, communication, and teaming skills. Finally, students completed a self-assessment on their level of proficiency.

Results: Three hundred and thirty-one students and nine medical and pharmacy faculty participated in the M1P1 event. Eight faculty and 354 students attended the M2P2 event. The M3P3 simulation engaged 379 students over two days, utilising twelve exam rooms. Eighteen faculty graded and facilitated the simulation.

The P1 and M1 students indicated "strongly agree" responses (71.17%) for "Health professional students from different disciplines should be educated to establish collaborative relationships with one another" and "Patient/client satisfaction is improved when care is delivered by an interprofessional team."

Regarding self-assessment of level of proficiency, about 30% of the P2 rated themselves as "proficient" for "practice[ing] team reasoning, problem solving, and decision-making." About 59% of the P3 students rated themselves as "proficient" for "practice[ing] team reasoning, problem-solving, and decision-making."

Conclusions: One IPE event per year was incorporated into the first three years of the medical and pharmacy programs to expose learners to core IPE competencies of roles and responsibilities, values and ethics, communication, and teamwork. Medical and pharmacy students rated their experience positively in their "strongly agree" ratings for being educated together and had higher ratings in the P3 year versus the P2 year in the IPE curriculum.

Inclusion of roles of other healthcare professionals in musculoskeletal conditions modules of the Bachelor of Pharmacy degree across South African universities

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Background: The Global Burden of Disease studies have reported that non-communicable diseases are on the rise. Musculoskeletal (MSK) conditions account for a significant amount of this global rise, ranking second only to mental health conditions. These conditions decrease patient quality

of life and burden healthcare systems. Pharmacists are healthcare professionals (HCPs) who are best placed to reduce the burden on the healthcare system. Pharmacists are an integral part of the healthcare system, often being the first point of contact for most patients. Although policies support the inclusion of pharmacists in the multidisciplinary team, pharmacists are often excluded during the implementation. It is, therefore, essential that opportunities for collaboration between pharmacists and other HCPs are created to enhance cultural transformation.

Pharmacy graduates need to possess the necessary knowledge and skills to seamlessly collaborate with multidisciplinary teams. However, there is a lack of publications on the knowledge acquired during undergraduate training that educates students on the roles of other healthcare professionals. This knowledge is crucial for pharmacists to effectively refer patients.

Aim: This study was to determine if the Bachelor of Pharmacy (BPharm) degree has introduced the graduates to other HCPs and their roles, using MSK conditions as an example to get an insight on the MSK conditions covered, non-pharmacological management, including collaboration with other healthcare professionals through appropriate referral of patients.

Results: Modules on musculoskeletal conditions, pharmaceutical care/clinical pharmacy, and pharmacy practice were obtained from six out of the nine universities that offer the BPharm degree. Participation was voluntary following ethical approval. A systematic comparative desktop review was conducted.

The most commonly encountered conditions were gout, osteoarthritis, rheumatoid arthritis, trauma and sports-related injuries found in the modules of all the six universities. The least encountered conditions were calcaneal spur, Paget's disease, plantar fasciitis, systemic lupus erythema and psoriatic arthritis, which were either seen at university 3 or 5. All six universities addressed non-pharmacological management of these conditions and made reference to topical and complementary alternative medicines (CAMS).

Five out of six universities (83.3%) mentioned other HCPs involved in the management of MSK conditions. Four (66.7%) of the universities mentioned physiotherapists, medical doctors and occupational therapists; three (50.0%) of the universities included acupuncturists; two (33.3%) mentioned podiatrists; and only one (16.7%) named dieticians, biokineticists, and chiropractors. At the same time, none of these universities address the scope, roles and responsibilities which other HCPs play.

Conclusion: The universities addressed the prevalent MSK conditions in their curricula. Graduates were made aware of different treatment options, such as topical treatment and non-pharmacological management, including Complementary and alternative medicine. The students were made aware of other HCPs, the most common ones being physiotherapists, medical doctors, and occupational therapists, although this varied across various universities. The role and responsibilities of these HCPs in the

management of MSK conditions were not clearly outlined. As a result, students may not be able to identify which conditions should be referred to which HCP, potentially leading to missed opportunities for referral and collaboration.

The development of a micro-credential digital health training module for pharmacy students in Malaysia

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Introduction: Digital health refers to using information and communication technologies in medicine and other health professions to manage illnesses and health risks and promote wellness. It has a broad scope and includes wearable devices, mobile health, telehealth, health information technology, and telemedicine. Studies show a compelling need to develop and establish a training module for pharmacy students in developing countries such as Malaysia. Objectives: The current study aims to report the developmental process of a micro-credential digital health training module for pharmacy students at the International Islamic University Malaysia.

Method: The module development was initiated in 2021 to develop a comprehensive telepharmacy training module for undergraduate Pharmacy students in Malaysia. The developmental process was divided into 2 phases. The first phase was a qualitative study conducted among the students, academicians and practising pharmacists to identify the teaching and learning components of a telepharmacy training module for undergraduate pharmacy students in Malaysia. Secondly was the development and official establishment of a micro-credential training module to be offered to future pharmacist in Malaysia to enhance their capabilities for the above purpose.

Results: Four key themes were identified from the qualitative study: the conduct of telepharmacy training, learning components of the module, skills required for telepharmacy, and infrastructure for training. All identified themes were incorporated and filed into a university micro-credential format. The developed module is equivalent to a 2-credit hour (CH) course. It is divided into three (3) submodules – theoretical, case-based learning & experiential learning components. The participants are required to physically participate or watch the 20-hour training videos and answer the assessment questions at the end of each sub-module. Four (4) instructors were identified to provide the teaching and learning materials.

Conclusion: The developed module is anticipated to play a major role in digital health training for future pharmacists in Malaysia, and feedback will be incorporated to improve it over time.

Integration of teaching of digital health-driven medical devices in pharmacy education

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Introduction: Interactive learning and training are core components of Doctor of Pharmacy (PharmD) education at the University of Southern California Mann School of Pharmacy. Medical devices are becoming an integral part of the therapeutic ecosystem with the emergence of digital health, companion diagnostics, and closed-loop insulin delivery. Hence, hands-on training on these devices is important for enhancing students' competency upon graduation. Such training equips students to counsel patients on the use of emerging medications such as biologics, ensuring adherence through effective guidance on administration and storage. Moreover, this approach may foster a more satisfying learning experience and improve retention of course content compared to traditional didactic instruction. The purpose of this study is to evaluate the impact of hands-on medical device training on PharmD students' self-assessment of changes in comfort with counselling patients on the devices, as well as retention of information regarding device use.

Method: Pre- and post-surveys were administered to third-year PharmD students in Spring 2023 and International Summer Student Programme (ISSP) students in Summer 2023. PharmD students were presented with a selection of potential medical device demos and assessed during an Objective Structured Clinical Exam (OSCE) to gauge proficiency levels. Participants in the ISSP, advanced undergraduate Pharmacy students, collaborated within teams to explore pharmaceutical, clinical, and regulatory aspects of their designated device. The devices (Trulicity, Evzio, Tymlos, Enbrel, Baqsimi, KwikiPen, Gvoke, Praluent, Combivent, Benlysta, Tyrvaya, Eylea, Benlysta, Lantus, Humira, and Emgality) were obtained as demo devices (no active ingredients) from the manufacturers (Regeneron Healthcare Solutions, Eli Lilly and Company, Oyster Point Pharma, Radius, Xeris Biopharma, Sanofi, Boehringer Ingelheim, GlaxoSmithKline Pharmaceutical Industry Company, and AbbVie) as gifts for educational purposes. The authors are particularly grateful to the manufacturers for providing access to these demo devices.

Results: In a class of 169 third-year pharmacy students, 127 responded to the pre-survey and 128 to the post-survey. Of the respondents, 92 (72%) felt uncomfortable counselling patients on medical device use before the session. This decreased to 20 (16%) post-activity. Out of 101 participants in the ISSP 2023, 90 responded to the pre-survey and 93 to the post-survey. Of these respondents, 45 (50%) felt uncomfortable counseling patients on medical device use pre-activity, which decreased to 4 (4%) post-activity. For respondents who answered both the pre-and post-surveys, the confidence in patient counseling (assessed on a scale from 1 to 10) increased significantly in both the PharmD course (n= 91, pre vs. post: 5.3 ± 2.1 vs. 7.9 ± 1.5, $P < 0.001$ by two-sided paired t-test) and the ISSP 2023 (n=68, pre vs. post: 6.0 ± 2.3 vs. 8.4 ± 1.2, $P < 0.001$).

Conclusion: Both cohorts reported enhanced retention of information through medical device-based teaching methods compared to traditional approaches. Moreover, they expressed feeling better prepared for future careers in the field of pharmacy owing to the integration of medical devices into academic settings. Hands-on training with medical devices may motivate students to broaden their consideration of career paths and explore regulatory or research aspects of new delivery devices.

Work-based learning: Closing the gap between pharmacy theory and practising pharmacy

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Background: Pharmacy education in South Africa has undergone significant transformation, embracing work-based learning as a cornerstone of curriculum development. The South African Pharmacy Council embraced this work-based learning by mandating a minimum of 400 hours of work by students in different sectors of the pharmaceutical profession. This evolution has been particularly notable at North-West University (NWU), where the challenges posed by the institution's rural setting and limited healthcare infrastructure in the surrounding area prompted the establishment of a robust clinical placement programme for fourth-year students.

Initiated from modest origins, the NWU's Potchefstroom Campus School of Pharmacy's clinical placement programme has evolved into a flagship initiative characterised by robust community engagement and a commitment to excellence. Overcoming logistical hurdles, the clinical placement programme offers ±200 fourth-year students exposure to

diverse facets of the pharmacy profession, from warehouse logistics to participation in multidisciplinary healthcare teams.

This session delves into the current implementation strategies of the clinical placement programme and ongoing development efforts, with a focus on international perspectives. By sharing these experiences, successes, and challenges and emphasising planning, logistics, student, and collaborator training, as well as assessment strategies, this aim is to provide insight into the transformative journey of work-based pharmacy education at the Potchefstroom Campus, School of Pharmacy of NWU and offer valuable lessons to educators around the world.

The amazing pharmacist: Incorporating gamification into assessment for learning

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Background: Assessment for learning is a teaching and learning approach that creates opportunities for students to independently identify learning gaps and receive feedback, which is then used to improve performance. Gamification is an alternative method of active learning that uses elements of games to teach educational material. The Amazing Pharmacist game was developed and used as an assessment for learning, providing pharmacy students with a fun and interactive learning environment where they race against their peers. Despite gamification being well documented, incorporating gamification with assessment for learning is a concept that has not yet been considered in pharmacy education.

Purpose: The research describes how the Amazing Pharmacist can be used in the assessment of pharmacy students' learning in clinical skills modules.

Methods: The Amazing Pharmacist game was introduced in 2019 to revise the clinical skills module of the fourth-year Bachelor of Pharmacy programme at the University of the Witwatersrand. This narrative description explains the planning, implementation and evaluation of the Amazing Pharmacist game for the revision of clinical skills.

Results: The Amazing Pharmacist game was used successfully to test and revise several concepts relating to application of knowledge and practising of clinical skills in a fun and interactive manner. Three major areas for consideration were identified and described.

Planning and design: Class sizes varied from 76 and students were divided into approximately 12 groups. A suitable venue was to accommodate the number of students and stations was found. The stations were designed based on the clinical skills module for example blood pressure measurement, interpretations of urinalysis and demonstration of injection techniques.

Race day: Approximately 11 stations were prepared. Student groups raced against each other in completing tasks in which they need to demonstrate competency before they moved to the next station. Tasks are either completed in groups or by selected group members. Groups were tracked using the amazingracer.co.za software.

Performance and Feedback: Performance was tracked through the amazingracer.co.za platform, which provided information such as the number of attempts and time taken per station. Stations where groups required additional attempts or took longer to complete were perceived as more difficult. Students were asked to share their opinions on the experiences through a self-administered questionnaire. Facilitators provided feedback on challenges faced and suggested improvements.

Conclusion: The Amazing Pharmacist Race concept provided an opportunity for formative assessment and promoted teamwork and communication through gamification. The analysis of the amazing racer.co.za data allowed facilitators to identify gaps in student knowledge or skill, which interventions such as extra revision sessions could be based upon. Feedback was used to make improvements to the game and optimise student experiences.

Breaking barriers: Establishing pharmacy-based immunisation training for potential workforce preparation to improve public health

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Introduction: The COVID-19 pandemic highlighted the urgent need to advance pharmacy service globally, particularly in vaccination efforts. However, existing legislation in South Korea prohibits pharmacists from administering vaccines, hindering their participation as an integral member of the

workforce in addressing the public health crisis. The aim is to present the development process of the first pharmacy-based immunisation delivery certificate training programme in South Korea, aimed at overcoming regulatory barriers and preparing the pharmacy community for potential immunisation roles.

Methods: A systematic approach was employed to establish the program. International partners of pharmacy faculty collaborated with local stakeholders to assess the needs of the Korean pharmacy community through educational sessions on global immunisation advocacy. Faculty partnerships were created with pharmacy organisations such as the American Pharmacists Association (APhA) and Korean pharmacy associations to navigate professional and legal challenges. The program's structure was finalised, and implementation was commented upon, including announcement, registration, and execution of the training. Feedback evaluation was conducted through a survey, gauging participants' experiences and perceptions using eighteen questions with 15 in 5-point Likert scale and three free-text questions.

Results: The inaugural programme successfully trained forty-eight pharmacy students who enrolled in pharmacy schools in South Korea and registered for the programme on a first-come, first-served basis. The training consisted of a 12-hour self-study component and was completed with an 8-hour live seminar, which was held on July 9, 2023, at Ewha Womans University. Participant feedback response rate was 64%, and they indicated high satisfaction and perceived value in learning immunisation and practising injection techniques. All students gave 4 points or higher out of 5 on most questions, and only four questions were marked neutral (3 points out of 5) regarding the registration process, self-study module in English, and a live seminar location. Notably, all participants stated intent to recommend the programme to their peers. In free-text responses, they emphasised its potential impact on advancing pharmacy practice in South Korea.

Conclusion: This initiative highlights the significance of education in overcoming regulatory barriers and equipping the pharmacy community with essential skills and knowledge. Lessons learned from this effort can inform similar initiatives globally, fostering greater engagement of pharmacists in public health interventions and preventative health care opportunities.

Comparative analysis of medical and pharmacy students' perception of academic fraud at two universities in Russia and the Republic of Belarus

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Introduction: In-depth studies of scholars all over the world have proved that academic fraud (AF) is a persistent phenomenon and an important issue for higher education, which undermines the quality of educational processes. The background of academic dishonesty, its nature and extent must be properly evaluated in medical universities as future doctors and pharmacists pose high responsibility for lives and health of society (Hsiao & Yang, 2011).

Objective: The study is aimed at examining medical students' engagement in various forms of AF. Empirical data from this study may become the basis for more comprehensive investigation of reasons for students' propensity to academic dishonesty.

Methods: The study was conducted by surveying students from 2 major medical universities in the Russian Federation and the Republic of Belarus from December 2021 to January 2023. The survey included 408 participants from the pharmacy faculty of RUDN University, Moscow (64% of the total number of students) and 223 students from Grodno State Medical University, Belarus (36% of the total number of students). Students in the sample included those majoring in pharmacy, general medicine, paediatrics, medical diagnostics and mental health medicine.

Results: RUDN students more frequently reported their opinion on the admissibility of AF compared with students from GRSMU, although the total number of students' answers was spread between two opinions: 43% don't accept AF, while 50% of students believe that such behaviour is possible in some cases. In general, upper-level students are less likely to cheat than junior students (27% of senior students against 29% of freshmen and sophomores). The dominant method of AF in 2 universities was using self-made cheat sheets (more than 50% of respondents in total). Other common types of AF are cheating from other students, plagiarism and cheating from electronic devices. It should be noted that the lack of time for proper mastering of the subject was ranked the most probable reason for students' propensity to AF (more than 40% of respondents' answers in total). Furthermore, no student from GRSMU reported the unimportance of a few disciplines for future careers as the background for AF, although 8% of pharmacy students from RUDN indicated such an attitude. About 30% of respondents from each major can avoid AF because of embarrassment when the act of academic dishonesty is discovered by the

teacher. Less than 5% of students in total considered groupmates' condemnation as the least likely reason which can make them refuse AF, which highlights the peer-related social factor's influence on students' propensity to academic dishonesty.

Conclusion: The study allows to conclude about the diversity of the acts of academic fraud among medical students, a wide range of its manifestation forms and the background for students' propensity to academic dishonesty.

Demography of pharmacists in France (projections)

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Pharmaceutical missions are expanding, and the authors need to be able to recruit new pharmacists to carry them out, both in hospitals and in community pharmacies. It is currently difficult to recruit pharmacists in France. The French Chamber of Pharmacists has, therefore, drawn up a roadmap aimed at making the profession more attractive. To assess the situation objectively, a study has been commissioned by the French Chamber of Pharmacists to estimate long-term demographic projections (25 years from now) for all pharmacy settings combined. The results of this study will be compared with the needs of the local healthcare system to ensure that pharmaceutical demography matches them and to anticipate strategic decisions for the profession in the years ahead.

Examining the perception of undergraduate health profession students of their learning environment, learning experience and professional identity development: A mixed-methods study

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Introduction: There has been an increased focus worldwide on improving the learning environment (LE) quality in higher education, particularly in health profession education programs (HPEP). However, the influence of the perceived quality of the LE on student-related outcomes, including

professional identity (PI) formation, has been overlooked regionally and globally, and there is a need to explore how the perception of the quality of the LE and PI varies across various HPEP students in different stages of their undergraduate education.

Aim: This study aimed to examine Qatar University (QU)-Health students' perception of the quality of their LE and their PI, examine the perception of the quality of the LE and PI development among QU-Health students with different sociodemographic characteristics, identify the association between QU Health students' perception of the quality of their LE and the development of their PI, and finally to understand the expectations of QU-Health students of the ideal educational LE.

Methods: An explanatory mixed-methods study was conducted. The quantitative phase involved inviting 908 undergraduate QU-health (i.e., Medicine, Dental Medicine, Pharmacy, Health Sciences) students to complete the Dundee Ready Education Environment Measure (DREEM) and the Macleod Clark Professional Identity Scale (MCPIS-9). A qualitative phase followed, with seven focus groups and a sample of QU-Health students, guided by the findings of the quantitative phase and the framework of Gruppen et al.. For the quantitative data, descriptive and inferential statistics were calculated, and a thematic analysis (i.e., inductive and deductive) was conducted for the qualitative data.

Results: The response rate was 57.8% (n = 525/908). The total DREEM tool scored 132/200, and the MCPIS-9 tool scored 24/45. The integrated data of both phases indicate that students believe that the teaching approach in their LE is concerned with developing their competence, confidence, and interpersonal skills. Students also believe that their faculty members are good at providing feedback; however, QU Health students had conflicting views regarding having a good emotional support system. With regards to perceptions of QU Health students toward their PI, the integrated results revealed that QU Health students felt that they shared characteristics with other members of the same profession and had strong ties with members of this profession.

Conclusions: QU Health students possess "more positive than negative" perceptions of their LE and a "good" perception of their PI. A positive intermediate correlation was identified between QU Health students' perception of their learning environment and that of their professional identity. Various attributes of an ideal LE included incorporating mentorship programs, facilitating access to all facilities, and implementing a reward system. Students also perceived their professional identity to be higher when they had relatives studying or had studied the same profession. Future research should focus on tracking changes in the perceptions of students and identify the long-term impact of implementing proposed attributes of an ideal learning environment on the learning process and professional identity development of students.

Exploring the perceptions of faculty members about research courses in undergraduate pharmacy curriculum: A qualitative study

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Introduction: The commitment of pharmacy graduates to patient care and research is crucial to advancing pharmaceutical science and practice. Consequently, the value of involving undergraduate pharmacy students in research has been increasingly recognised. Given that the College of Pharmacy (CPH) at Qatar University (QU) offers two undergraduate pharmacy research courses, it is relevant to explore the perception of faculty members of the delivery, impact, facilitators, barriers, and suggested improvements in these courses. This exploration will help to improve the existing curriculum and highlight the prospective impact of student involvement in undergraduate pharmacy research courses on the personal and professional growth of students, as well as on the progressive evolution of the pharmacy profession.

Aim: This study aimed to 1) examine the perceptions of faculty members about the delivery and impact of undergraduate research courses in CPH, 2) examine the perceptions of faculty members regarding facilitators and barriers to the delivery and impact of undergraduate research courses, and 3) examine possible improvements to undergraduate research courses according to the perceptions of faculty members.

Methods: A qualitative exploratory case study was performed in which five virtual focus groups were conducted. All eligible faculty members from the clinical pharmacy and pharmaceutical science departments with experience supervising students who had taken one or two undergraduate pharmacy research courses were invited to participate. The focus group questions were based on the Theoretical domain framework of behavioural determinants. Verbatim transcription was performed, and the collected data were thematically analysed using the computer-assisted coding software NVivo®.

Results: Of the 26 eligible faculty members, 21 participated in this study. Five deductive themes were identified: social, professional role and identity, beliefs about research capabilities and skills, beliefs about consequences and goals, and environmental resources and behavioural regulation. Overall, faculty members identified themselves as assessors and mentors. Participants expected students to possess independence, responsibility, and motivation. They believed that students generally required more practical research skills. Several benefits of incorporating students into undergraduate research have been highlighted, including increased publication productivity and quality. However, several hurdles to undergraduate research in pharmacy have been identified, including limited resources, limited timeframes, and sometimes delayed ethical approval.

Conclusions: Faculty members expressed optimism regarding the undergraduate research courses. However, some logistical concerns, including the lengthy ethical approval process and resource availability, must be addressed to optimise the effectiveness of these courses.

Implementing a flexible development pathway to upskill the pharmacy workforce in Northern Ireland

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Introduction: Radical reform of pharmacy initial education and training (IET) has taken place in the UK (including Northern Ireland) over recent years. The UK pharmacy regulators published new IET standards to support this reform in 2021. Undergraduate MPharm programmes and pre-registration Foundation Training Year (FTY) programmes in the UK have been revised to phase in the introduction of prescribing training. Pharmacists registering in 2026 will also be independent prescribers. There is a need to upskill the current pharmacy workforce to the new IET standards, and to provide a development pathway for onward progression for the entire pharmacy workforce.

Method: A stakeholder event was held in February 2022 to develop a flexible Post-Registration Foundation Programme (PRFP) for all registered patient-focused pharmacists working in Northern Ireland. At this event, it was agreed that the PRFP would cover the outcomes of the Royal Pharmaceutical Society (RPS) Post-registration Foundation Pharmacist Curriculum in two parts:

• Part 1 - FP1: fundamentals of pharmacy practice

• Part 2 - FP2: proficient pharmacy practice

It was agreed that FP1 would be a flexible programme to upskill the current pharmacy workforce to the new IET standards. FP2 would provide a development pathway for those wishing to progress on towards Advanced Practice. The IET standards were used to design FP1. These standards were mapped to the RPS Post-registration Foundation Pharmacist Curriculum; the remaining outcomes and descriptors were used to design FP2.

Results: Two Recognition of Prior Learning (RPL) pathways were incorporated into FP1 to ensure flexibility. RPL pathway 1 allows experienced pharmacists to write a full summary of their prior experience (SPE) to demonstrate all the FP1

learning outcomes without joining FP1. In RPL pathway 2, pharmacists join FP1 and complete a personal development plan (PDP) together with their Educational Supervisor/mentor. They write a partial SPE demonstrating which of the FP1 learning outcomes they already meet. They attend FP1 workshops/webinars and complete relevant FP1 work-based practice activities (PAs) to fill in any identified gaps. Non-RPL pharmacists joining FP1 attend all FP1 workshops/webinars and complete all FP1 work-based PAs. On successful completion of FP1, pharmacists can progress onto FP2. FP2 pharmacists attend all FP2 workshops/webinars and complete all FP2 work-based PAs, but there is no recognition of previous experience.

FP1 was launched in September 2022. By the start of March 2024, three pharmacists had completed RPL pathway 1, two of whom had progressed to FP2 (which was launched in September 2023). 120 pharmacists had joined FP1 (83 hospital pharmacists, 35 GP practice pharmacists, and two community pharmacists). 46 of those pharmacists had successfully completed FP1, 41 of whom had chosen to progress on to FP2.

Conclusion: A flexible development pathway to upskill the pharmacy workforce in Northern Ireland has been implemented. To date, a number of pharmacists from the hospital and GP practice sectors have engaged with the pathway, with only a small number joining from the community pharmacy sector. Further work is required to address this.

University of the Western Cape's online postgraduate medicine regulatory science programme: Students' reflection on achievement of learning outcomes and workplace relevance

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Introduction: The African medicines regulatory landscape is undergoing a transformation in response to the African Union's New Public Health Order and the growing healthcare needs of the continent. However, over 90% of the National Medicine Regulatory Agencies (NRAs) in Africa cannot perform core medicine regulatory functions, have a shortage of competent regulatory professionals, lack diversity of scientific expertise, and have staffing shortages relative to the high workload. An African contextual capacity development strategy to develop the regulatory workforce is therefore crucial to addressing the existing shortfalls in a regulatory capacity.

Method: The University of the Western Cape (UWC), in collaboration with the Faculty of Capacity Development,

Ireland, is currently implementing postgraduate training in regulatory sciences as an additional qualification for professionals interested in the regulation and registration of health products, including vaccines, in Africa. The online training was set up to develop competencies and soft skills in ethics, clinical research, statistical analysis, international regulations, licensing, pharmacovigilance, complementary and traditional medicines, health economics, and advanced scientific thinking via a demanding research thesis. A post-training student evaluation was conducted to assess if the learning outcomes were achieved and elicit understanding or beliefs that were challenged in the students. The authors also assess how the students applied the learning in their current workplace or elsewhere.

Results: Students reported that the learning objectives were achieved and that the learning was relevant to their roles by practising their newly acquired skills with their peers in real-world situations, as the program. Students' critical self-reflection revealed the capability to perform the skills being taught and the potential to help their organisations improve their execution of regulatory and clinical research projects.

Conclusions: The students' evaluation revealed that this mission to develop capacity in medicine regulation and to support Regulatory Agency professionals in Africa is being achieved. This methodology and innovative use of technology create a highly personalised curriculum that enables higher-order learning and the attainment of valuable executive and leadership skills.

Examining the status of quality assurance of pharmacy education using the FIP self-assessment tool

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Background: The FIP, the WHO, and the UNESCO jointly recognise the need to build capacity and expertise in quality assurance (QA). Whether nationally or regionally, QA systems must ensure that educational programmes are supported by a research-active environment, are competency-based, and reflect a modern vision for pharmacy practice. In 2020, FIP launched the 21 FIP Development Goals (FIP DGs), which bring workforce, practice, and science together into one pharmacy transformative framework in alignment with wider

global imperatives, such as the United Nations Sustainable Development Goals and WHO Global Strategy on Human Resources for Health Workforce 2030. The "workforce" element of FIP DG 3: quality assurance, targets the global availability of transparent, contemporary, and innovative processes for the QA of needs-based education and training systems. To that end, the global leads of the FIP DG3 developed a self-assessment tool for QA of pharmacy and pharmaceutical sciences education.

Purpose: The aim of this study was to examine the status of QA of pharmacy and pharmaceutical sciences education globally, identify areas of improvement, and offer recommendations to improve the QA of pharmacy and pharmaceutical sciences education continuously.

Methods: The self-assessment tool of QA of pharmacy and pharmaceutical sciences education was developed utilising the FIP pharmacy education in sub-Saharan Africa report, which investigated the QA and accreditation systems across seven sub-Saharan African countries. The tool was validated using content and face validity measures and then was administered among the FIP Academic Institution Members (AIM) using an email link to SurveyMonkey®. Descriptive and inferential data analysis was conducted using IBM Statistical Package for Social Sciences, SPSS®.

Results: The findings suggested that most academic programs undergo periodic accreditation by an external accreditation body (94.44%). The academic pharmacy programs were shown to be accredited equally by private/non-governmental accrediting bodies or regional/national professional organisations. However, the most frequently reported accreditation activity was the accreditation site visit by a team from the external body (96.55%). Most participants reported having accreditation standards available for pharmacy programs specific to their country (83.33%), with a national accrediting organisation or the regulator being the authorities who set these standards (64.00%) and (60.00%), respectively. The most frequently reported standards used for quality assurance of pharmacy education were the FIP global framework (66.67%), followed by the WHO standards (33.33%). The requirements of these accreditation standards included indicative curriculum (86.21%), prescribed hours of study (75.86%), prescribed numbers and levels of academic staff (75.86%) and the availability of clear learning outcomes (75.86%). Overall, participants agreed that the accreditation systems for pharmacy education in their country are relevant, add value, and assist in advancing the standards of pharmacy practice (average agreement >3.7/5).

Conclusion: Implementing quality assurance measures in pharmacy education is essential for assessing and enhancing the quality of pharmacy education and training. This will ultimately result in graduating a competent pharmaceutical workforce, which is vital for improving the quality of health services. The results and recommendations of this study will help the pharmacy academic programs to develop transparent, contemporary, and needs-based processes for QA.

Pharmacy Interventions Identified by 3rd year pharmacy students within a didactic learning Activity utilising real world electronic medical records

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Introduction: Doctor of Pharmacy graduates from the United States are prepared to provide evidence-based, patient-centred care through the pharmacy patient care process (PCPP) per the Accreditation Council for Pharmacy Education (ACPE). The PCPP includes data collection, assessment, plan implementation, and follow-up monitoring skills, which are frequently taught through faculty-developed patient cases in the classroom, and then applied during clinical rotations. The authors developed a novel learning activity for the final didactic clinical capstone course orienting to and navigating through electronic medical records (EMRs) of patients hospitalised at faculty clinic sites in real time. Several publications describe pharmacy interventions made by pharmacy students during clinical rotations. The authors aimed to describe patient-specific pharmacy interventions identified by 3rd-year pharmacy students prior to progression to clinical rotations after orientation to a popular EMR in the classroom setting.

Methods: Descriptive study of pharmacy interventions identified by pharmacy students after review of real, hospitalised internal medicine patient EMRs during a clinical capstone course. During the 3rd year clinical capstone course, students were oriented to the EMR utilised at numerous clinical rotation sites. Students were then assigned 12 real, hospitalised internal medicine patients' EMRs to review over two hours in the classroom setting and asked to submit a prioritised list of patients reviewed, time per patient review, and recommendations to optimise current patient pharmacotherapy.

Results: In 2023, 126 students participated in the activity, and 113 students submitted a prioritised list of patients reviewed, time per patient review, and recommendations for the patients they were each assigned. Eighteen percent of students reported taking less than 15 minutes per patient review, 30% reported 15-25 minutes, and 37% reported 25-35 minutes. Only 15% reported taking more than 35 minutes or not being able to review a patient within the allotted time. Patient stability based on vital signs or labs and reasons for hospitalisation were the most frequently cited reasons for prioritisation. In total, 1,020 pharmacy interventions were identified, including 312 medication additions or restarts, 110 discontinuations, 168 therapy changes, 79 dose changes, 41 educational opportunities and 61 monitoring needs. All 113 students included the patient-specific or evidence-based rationale for their proposed interventions.

Conclusions: Students demonstrated the ability to identify numerous opportunities to optimise pharmacotherapy in actual patients through an EMR learning activity introduced prior to clinical rotations in the classroom, supporting student readiness to apply the pharmacy patient care process in clinical rotations.

AACP sex-based demographics 2010–2024: Emerging female faculty and leaders

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Introduction: AACP conducts the Roster and Faculty Salary Survey in which schools are asked to report demographic, contact and salary information for all full-time faculty, contracted part-time faculty, emeriti, administrators and professional staff. The results of this survey are published in the Profile of Pharmacy Faculty on an annual basis. The purpose of this study was to examine how sex-based demographics of faculty and college of pharmacy leadership roles have changed over time.

Methods: In this work, the authors compiled the data on faculty and administrators by rank and compared the sex-based demographics over the years of 2010 to 2023.

Results: In terms of faculty across all colleges/schools of pharmacy, Assistant Professors were composed of 59% F:41% M in 2010, which moved to 61% F: 39% M in 2023. Associate Professors were composed of 43% F: 57% M in 2010, which moved to 54% F: 46% M in 2023. Professors were composed of 22% F: 78% M in 2010, which moved to 38% F: 62% M in 2023. Similarly, Assistant Deans were composed of 53% F: 48% M in 2010, which rose to 61% F: 39% M in 2023. Associate Deans were composed of 28% F: 72% M in 2010, which rose to 54% F: 46% M in 2023. Deans were composed of 25% F: 75% M in 2010, which rose to 33% F: 67% M in 2023. These data demonstrate a common trend across assistant, associate, and professor/dean positions, with an increasing percentage of individuals identifying as females in all categories. Interestingly, Assistant Professors and Assistant Deans have been predominantly female over the entire evaluation period. Whereas Associate Professors and Associate Deans have become predominantly female in 2018 and 2021, respectively. Full Professor and Dean positions remain predominantly male in 2023. However, the gap has significantly narrowed, with a strong likelihood of being predominantly female in the near future.

Conclusion: Given the fact that these pharmacy students enrolled are predominantly female, the change in demographics is both logical and more representative of the individuals that the authors train. Another conclusion is that change in demographics of faculty and administrators are occurring, but take decades to reach full realisation of the new steady-state for this academic profession.

Dragon's Den: A pharmacy service innovation MPharm module in the UK

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Introduction: As the pharmacy profession continues to move towards a health service-provision model, there is a growing need for new educational approaches that bridge theory, inter-professional innovation and pharmacy practice. The Dragon's Den assessment, implemented within the MPharm at University College London, School of Pharmacy, United Kingdom, aims to address these needs by assessing students' abilities to develop and pitch a new pharmacy service, fostering innovation skills towards service design and addressing unmet population health needs. This paper evaluates the impact of the Dragon's Den model on enhancing professional skills among pharmacy students, linking education and practice needs.

Method: The study employed a mixed-methods approach, surveying Master's level pharmacy students (n=80) to assess skill development across various domains. Quantitative data were collected through Likert-scale questionnaires, while qualitative data were sourced from open-ended student feedback. Statistical analysis of the quantitative data provided insights into central tendencies and dispersion, complemented by thematic analysis of the qualitative responses.

Results: The quantitative analysis underscored the module's substantial impact on enhancing various professional competencies among the participants. Specifically, critical thinking on health innovation emerged as the most positively impacted area, with a mean score of 1.93 (SD = 1.03), signifying strong agreement on its effectiveness. This was closely followed by presentation skills, with a mean of 1.88 (SD = 1.14), and teamwork skills development, which recorded a mean of 1.93 (SD = 1.23). The development of problem-solving skills in pharmacy was also positively rated, with a mean score of 2.42 (SD = 1.45), alongside digital literacy skills, which had a mean of 2.02 (SD = 1.25). These mean scores, reflective of the 1-7 Likert scale with one indicating 'Strongly Agree', confirm the module's effectiveness across these critical areas. Qualitative feedback reinforced the quantitative data, particularly highlighting the enhancement of critical thinking on health innovation as pivotal, with many students attributing their increased ability

to critically evaluate existing services and fill in the gaps to innovate and leverage technologies in pharmacy settings. Students also reported significant gains in confidence around communication skills and their ability to engage in interdisciplinary teamwork.

Conclusion: The Dragon's Den module has demonstrated a positive impact on enhancing professional skills crucial for service delivery in the pharmacy sector, as indicated by the high percentage equivalents of the mean scores in essential skill areas. The study supports the module's role in preparing pharmacy students for the evolving demands of pharmacy service delivery. There is a need for continued involvement of commissioners (Dragons) and refinement of such innovative instructional methods in pharmacy education to ensure graduates are well-prepared for the dynamic healthcare environment and advance the profession globally.

Global leaders in Development: A global leadership module across three international pharmacy schools

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Introduction: The concept of global mindset, global citizenship and global leadership are crucial to delivering on the International Pharmaceutical Federation (FIP) development goals but remain an overlooked aspect of pharmacy education internationally. The objective of this study was to assess the impact of the Global Leaders in Development (GLIDE) module to determine whether the concepts of global mindset, citizenship and leadership can be effectively taught within a short-term didactic module.

Methods: Faculty members of PharmAlliance, a partnership between three schools of pharmacy, created a three-week optional, non-credit-bearing distance-based global leadership development module. Material and assignments focused on the concepts of global mindset, global citizenship and global leadership as applied to the global health issues of non-communicable diseases, universal health coverage and primary care. Student self-rated growth was measured with an adapted fifteen question pre–post-survey that also included open-ended questions.

Results: Most statements showed growth on the pre–post-survey, with seven being statistically significant ($P < 0.05$). The largest growth involved students' perceived potential to be a global leader in pharmacy (global leadership category), the students' connectedness to the pharmacy profession worldwide (global citizenship category) and the student's awareness of global challenges faced in the pharmacy profession (global mindset category). Qualitative analysis

identified several themes for each of the open-ended questions. Student expectations focused on the desire to expand their global mindset, better understand global pharmacy practice, develop teamwork skills and understand global pharmacy challenges and strategies for engagement.

Conclusions: The concepts of global mindset, global citizenship and global leadership may help promote awareness of global health challenges, opportunities to make a global difference in a local context and connectivity to the pharmacy profession on a global scale. There is further opportunity for pharmacy schools to work together to co-develop, deliver and amplify global leadership courses to support a globally-minded pharmacy workforce in any context.

Breaking boundaries–Designing an engaging online capstone course for diverse PharmD students

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Introduction: The University of Colorado's Distance Degrees and Programme (DDP) PharmD pathway offers two mid-career pathways: the International-Trained PharmD (ITPD) programme and the North American Trained PharmD (NTPD) program. ITPD is designed for internationally trained pharmacists with a bachelor's degree from a non-U.S. approved program, while NTPD is for post-baccalaureate students. All DDP students, regardless of pathway, must complete a Clinical Capstone course before beginning their advanced pharmacy practice experience (APPE) clinical rotations. A six-credit Capstone course for traditional entry-level PharmD (ELPD) students already existed. However, it required adaptation to align both curricula while also meeting the needs of the online, primarily asynchronous DDP program. This evaluation reviewed the processes involved in the creation of this course.

Methods: The existing ELPD course was used as a foundation and reviewed by DDP faculty members. Topics and activities that could be removed to account for differing credit hours were identified. With instructional design support, the remaining live activities were adapted for flexible, online learning and pedagogical teaching and learning methods. Throughout the semester, the ELPD course directors, instructional design staff, and DDP faculty communicated weekly to ensure updated and aligned course content, delivery, and assessments. The 2023 student course evaluations (ranked from 1 to 5, with 5 being the highest score), student performance and faculty/instructional design

observations were reviewed, and changes were implemented for the 2024 offering.

Results: An online, 3.5 credit Clinical Capstone course was developed and implemented into the DDP curriculum, with intentional alignment of course content, structure, teaching and learning methods, and assessment with the ELPD delivery/offering. The courses ran concurrently and provided identical assessments, lectures, and skills practice through live facilitated discussions. DDP adapted the live discussions to accommodate students in different time zones by providing multiple time slots for participation, though content and expectations remained identical. DDP students were also given the opportunity to attend live ELPD sessions synchronously. The courses varied in credit hours, grading scheme, syllabus, and the learning management system shell. Course evaluations were primarily positive. Course evaluations scored 3.7 - 4.5, with lower scores related to organisation and workload. Overall course performance was good for both groups, albeit higher for the ELPD vs DDP cohort (course average 88.8 v 85.3%, comprehensive final exam 79.3% v 72.7%).

Conclusions: An ELPD Capstone course was successfully adapted to meet the needs of the DDP online learners. Notably, DDP students are mid-career, working professionals balancing classwork and employment, and they performed well in the course adapted from the ELPD curriculum. This work will serve as a foundation for adapting activities for the online learner and promote success for both ELPD and DDP students throughout the curriculum.

Harmonising pathways: Evaluating non-traditional and international PharmD students alongside entry-level students in a unified curriculum

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Introduction: The University of Colorado's Distance Degrees and Programme (DDP) offers two mid-career PharmD pathways: the International-Trained PharmD (ITPD) programme and the North American Trained PharmD (NTPD) program. ITPD is designed for internationally trained pharmacists with a bachelor's degree from a non-U.S. approved program, while NTPD is for post-baccalaureate students. The students in these pathways have traditionally taken online, asynchronous courses separately from the traditional Entry-Level PharmD Programme (ELPD). Over the last two years, significant progress has been made in harmonising DDP courses with ELPD courses to ensure course

equivalency for all the PharmD pathways. "Harmonisation" is loosely defined as the process of ensuring the same or similar credit hours, content, assignments, and assessments between ELPD and DDP pathways. This evaluation assesses performance and feedback from DDP students in harmonised courses.

Methods: Full harmonisation was piloted in two courses: Evidence-Based Medicine [EBM] and Clinical Problem Solving Skills [CPSS]) in the 2022-2023 academic year. The second iteration ran in 2023-2024, along with two additional courses (Pharmacotherapy [PT] 1 and 5). Course content is identical between pathways except for increased flexibility for DDP student deadlines, examination windows, and required synchronous participation. Student perceptions and satisfaction with the harmonisation process were evaluated using course evaluations with a 5-point Likert scale and a post-course survey. Student performance was compared using t-tests. Similar methods will be used for the harmonised courses in the Spring 2024 semester.

Results: Overall course averages for the EBM and CPSS courses were good for both groups, albeit higher for the ELPD vs DDP cohort (2022 EBM: 89.3% v 85.4%, $p < 0.05$; 2023 EBM: 90.3% v 85.0%, $p < 0.05$; 2023 CPSS: 90.0% v 80.2%, p-value < 0.05). Thirty students in the DDP cohort participated in the surveys. Survey results for these harmonised courses were primarily positive. Two-thirds (66.7%) of respondents attended at least one class synchronously and 70% of responding students felt their academic performance was the same or better when compared to non-harmonised courses. Feedback included comments on accessibility, technology constraints and benefits, and scheduling. Multiple students commented on the feeling of inclusion that came with being in the same course as ELPD students. Both EBM offerings and the CPSS offering were ranked well, with scores between 4.2-5 for course outcomes/learning strategies, structure, assessments, and course directors.

Conclusions: Harmonised classes provide a unique opportunity to bring DDP and ELPD students together through technology while maintaining flexibility for the primarily asynchronous DDP program. Notably, DDP students are mid-career, working professionals balancing classwork and employment and reported positive feedback in surveys and course evaluations. Student feedback and additional data from this project will continue to inform the harmonisation of subsequent courses.

Empowering pharmacists through FIP AcPS Scholarship Workgroup 2019– 2024

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Background: The FIP Academic Pharmacy section (AcPS) set a goal of promoting scholarship in pharmaceutical education in their strategic planning. A workgroup was empanelled to engage members in scholarship.

Purpose: The overall objective of the workgroup was to support pharmacy educators in developing their scholarly potential.

Methods: The FIP AcPS Educator Development Workgroup was convened in November 2019, and one of the subgroups that was formed was charged with Promoting Scholarship in Pharmaceutical Education. Members of the AcPS were assigned to this group and met for the first time in December 2019 where two sub-objectives were developed along with strategies to meet these objectives: Promote the Scholarship of Teaching and Learning (SoTL) and Increase Scholarly Productivity of Educators. Over the course of five years, the members created deliverables to achieve the objectives.

Results: Six strategies were developed to achieve the two sub-outcomes, and all of them resulted in deliverables. These include encouraging participation in the #RxWritingChallenge, which has engaged a total of 93 pharmacy educators from all regions of the world. A webinar entitled Mastering Writing Productivity: Tips and Tricks from Pharmacy Faculty shared experiences from a diverse panel of pharmacy faculty and provided nearly 300 participants with strategies to address barriers to writing productivity. Two white papers were developed: one advocating for scholarship of teaching and learning to be considered in promotion and/or tenure decisions and advocating for a designated portion of time in educators' job descriptions for scholarship. A table comparing a wide variety of journals publishing pharmacy and pharmaceutical research was created to help pharmacy educators in choosing where to submit their work. This led to the development of the Academic Pharmacy Section Special Issue of the Pharmacy Education Journal (PEJ) to highlight the work of and celebrate the first 50 years of the FIP AcPS. It included a total of 22 articles and was published in September 2022.

Conclusion: The FIP AcPS Educator Development Workgroup members of the subgroup tasked with Promoting Scholarship

in Pharmaceutical Education were able to accomplish several significant activities with tangible deliverables over the past five years of this committee's work. There were two main foci. Some projects focused on the writing process and improving skills (#RxWrightingChallenge, providing guidance on pharmaceutical journals and the publication process, and the writing webinar) and the two white papers provided support for increasing faculty scholarship productivity by advocating for a designated time to write as part of their academic employment and advocating for SoTL to be included in the type of research considered in tenure and promotion decisions. All of this work will live on in either published form in the PEJ or an archived webinar that is available for future viewing. In this way, the committee's work exemplified the scholarship it was tasked to promote. This would be an ideal model for the future work of FIP committees.

Evaluation of the Africa Leadership Fellowship-AMS programme for pharmacists: Exploring what leadership means to me

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Introduction: The Africa Leadership Fellowship-AMS (ALF-A), a year-long initiative, seeks to equip pharmacists with skills for healthcare leadership, focusing on antimicrobial stewardship (AMS) projects. ALF-A incorporates a series of online learning courses in antimicrobial stewardship, behaviour change, quality improvement, and health leadership, supplemented by webinars to contextualise online learning. A novel webinar was developed and delivered to support the "Exploring what leadership means to me" UK NHS Leadership Academy's Edward Jenner programme (1) online coursework. The webinar included plenary and breakout sessions featuring the exercises "Telling my story", "Share your wildly important goals and barriers", and "Exploring feedback and listening".

Purpose: This study explores views and opinions of ALF-A fellows on the inaugural ALF-A webinar focused on "Exploring what leadership means to me".

Methods: An online feedback survey was developed via SurveyMonkey™ to gather information on the webinar content and delivery, including the effectiveness of the exercises used to promote reflection and personal growth. All

the data was entered into Excel and analysed using descriptive statistics. The open-ended questions included in the survey were inductively analysed using NVivo14.0®.

Results: A total of 26 responses were received. More than half of the fellows (68%) scored the "Telling my story" exercise as the most interesting part of the webinar since it helped them step out of their comfort zone and self-reflect about themselves and their practice. The learning outcomes of the webinar were identified across five themes: challenges of sharing personal information, the importance of feedback on self-awareness, handling criticism and praise, reflection and goal setting, and realisation of achievability. Fellows recognised that skills covered under these five themes could be applied in their day-to-day leadership responsibilities. Key takeaway messages of the session included gaining insights about self, understanding the concept of leadership and self-awareness, and how nurturing new features and dealing with feedback are important components of becoming leaders.

Conclusion: As the ALF-A programme progresses, the positive reception of this first webinar and the learnings from its evaluation will serve as a crucial precursor to upcoming sessions. The ALF-A programme, with its strategic integration of the Edward Jenner leadership programme, is poised to continue shaping and empowering healthcare leaders in the realm of antimicrobial stewardship within the unique context of sub-Saharan Africa.

The development and evaluation of leadership skills assessment tools for pharmacists in resource-limited healthcare settings

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Background: The Commonwealth Pharmacists Association (CPA) introduced the Africa Leadership Fellowship-Antimicrobial Stewardship (ALF-A) program, the first-of-its-kind in sub-Saharan Africa, to address leadership training gaps for pharmacists. ALF-A, a year-long initiative, aims to empower early-to-mid-career pharmacists with skills for health leadership, focusing on antimicrobial stewardship (AMS) projects. While common in health leadership training and development, tailored self-assessment and 360-degree feedback tools are lacking for pharmacists in low-resource

settings. The CPA developed such tools based on the International Pharmaceutical Federation Global Advanced Development Framework (FIP-GADF), focusing on four competency clusters: Expert professional practice, Working with others, Leadership, and Management.

Purpose: To develop and evaluate leadership development assessment tools tailored to pharmacists in resource-limited healthcare settings.

Methods: Development phase: The Advanced Stage 1 level in four competency clusters of FIP-GADF was selected, covering 24 "competency descriptors" within the self-assessment questionnaire; the 360-degree feedback tool for senior colleagues, adapted from the self-assessment, included 14 descriptors. Content validation phase: A group of experts provided feedback about the tool's clarity, comprehensibility, and appropriateness for the target group. Evaluation phase: Jotform™ and SurveyMonkey™ were used to develop online questionnaires based on the self-assessment and 360-degree feedback tools, respectively. Self-assessment questionnaires were sent to 45 fellows before the fellowship in October 2023 (Cohort 1) and January 2024 (Cohort 2). The 360-degree feedback questionnaires were sent to up to five senior colleagues (a total of 225). Respondents used a 5-point Likert scale and free-text sections for qualitative insights. The Likert scale included: 1) Very rarely, or never meets the descriptor, to 5) Always, or consistently, meets the descriptor. Data analysis involved descriptive statistics in Excel and thematic analysis using NVivo14.0® for free-text responses.

Results: A total of 43 fellows (96%) and 215 senior colleagues (96%) completed the self-assessment and the 360-degree feedback tool, respectively. Whilst most fellows self-assessed their competencies highly (≥3 on the Likert scale), only 2 (<1%) stated they met all descriptors very often/almost always or always/consistently (≥4 on the Likert scale). This was consistent with senior colleagues' feedback, with 79 (37%) stating that 35 fellows (81%) met all descriptors very often/almost always or always/consistently. Scores in both surveys were lower for Management, followed by Leadership clusters.

The main themes gathered from free-text sections on the overall reflection of fellows' leadership and management styles could be described across 8 main themes: Desire for team unity and excellence, Role of leadership/management style in self-improvement and team dynamics, Importance of communication and collaboration, Self-awareness and motivation, Delegation and guidance, Strategies for organisation and goal setting, Time management and meeting deadlines, and Challenges and areas for improvement.

Conclusion: ALF-A has enabled fellows' self-reflection and facilitated the identification of strengths and areas of leadership development. The choice of use of low-level competency descriptors could explain the results obtained, with fellows self-assessing their competencies highly across

most competencies. ALF-A monitoring and evaluation activities are ongoing, with self-assessment and 360-degree feedback questionnaires to be repeated at the end of the programme to compare with the baseline.

Expansion of a Spanish language track programme for pharmacy students: Addressing language barriers in healthcare

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Introduction: In the United States, people of Hispanic/Latino backgrounds face disparities in access, quality, and outcomes of health care. The Hispanic/Latino population is the second largest minority group in the United States. As patient advocates, pharmacists should have a basic understanding of both the Spanish language and cultures. While Purdue University offers a Spanish for the Professions minor, this was not adequate to prepare students to care for Spanish-speaking populations in a healthcare setting.

In 2022, the Purdue University Center for Health Equity and Innovation (CHEqI) established a Spanish Language Track (SLT) program. The mission of the programme is to provide student pharmacists opportunities to understand and practice language-concordant healthcare delivery and promote improved health outcomes in Spanish-speaking populations.

Method: Student pharmacists who elect to participate in the SLT are expected to obtain a Spanish for the Professions minor, enrol in an online medical Spanish program, participate in service learning projects focused on health equity, and volunteer at health fairs to develop an understanding of the social determinants of health. During their time at Purdue, SLT student pharmacists attend monthly meetings dedicated to practising medical conversations in Spanish, which are led by CHEqI staff and Visiting Clinician Scholars from the Colombia-Purdue Partnership. The goal is to utilise written and verbal Spanish in the pharmacy patient care process and establish trust with patients by demonstrating competency in their preferred language. Patient appointment simulations (PAS) and culture and context case discussion formats are used for these meetings. SLT participants can also participate in advanced pharmacy practice experiences in Indianapolis, Indiana, and Medellin, Colombia, which will allow them to utilise their language skills in direct patient care settings.

Results: To date, there have been two cohorts of students who have enrolled in the SLT. Cohort 1 included twelve students, and Cohort 2 added an additional four student pharmacists. There is only one student participant who is a native speaker and of Hispanic/Latino ethnicity. Eight students have completed Canopy Learn®. Based on participant feedback, the PAS sessions have become more frequent (bi-monthly) and have expanded to include both in-person and virtual learning sessions. Feedback from a post-programme survey of cohort one identified the PAS and Spanish-speaking volunteer opportunities as the most impactful SLT activities.

Conclusion: The promotion of both language learning and cultural immersion will support student pharmacists in providing more inclusive, well-rounded care to patients. The SLT programme empowers student pharmacists to use their Spanish language skills during experiential learning and in future careers.

University partnerships to develop community healthcare experiences for student pharmacists: Addressing social determinants of health in local communities

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Introduction: In 2018, the Purdue University College of Pharmacy (PUCOP) and Universidad de Antioquia (UdeA) collaborated to establish an Advanced Pharmacy Practice Experience (APPE) in Medellin, Colombia. The focus of the APPE is on pharmacy practice and pharmaceutical care in a variety of clinical settings. The experience also offers an opportunity to gain experience with medical Spanish. PUCOP students and faculty who engage in this university collaboration utilise the language skills and similar models of care when working with underserved populations through engagement with the Center for Health Equity and Innovation (CHEqI) based in Indianapolis, Indiana.

Servicio Orientación Farmacéutico y Alimentaria (SOFYA) is a health and wellness programme based at UdeA. SOFYA and CHEqI have similar approaches to addressing the social determinants of health (SDOH) within local communities. Started in 2022, SOFYA, composed of many different health professions, strives to provide education and training on medication and health related topics for university students

and the surrounding community. There is a lack of education, health literacy, and many barriers in addressing SDOH within these communities.

Built on the seven pillars of self-care SOFYA initiatives include: medication education, menstrual hygiene, preventative health screenings, and health and nutrition education games.

Objective: The objective of this project was to strengthen connections between PUCOP and UdeA, establish reciprocal strategic solutions to address equitable healthcare delivery within SOFYA and CHEQI and broaden the engagement of PUCOP student pharmacists in the local community in Medellin.

Methods: Faculty from SOFYA and CHEqI attended regularly scheduled sessions to share strategies and implementation plans for community-based events in Indianapolis and Medellin. PUCOP student pharmacists authored an Office of Engagement Service Learning Grant to support their engagement in SOFYA during their APPE at UdeA.

Results: SOFYA and CHEqI identified two initial areas that are the focus of reciprocal innovation plans: provider language training and the development of patient education tools that address SDOH.

In 2023, PUCOP student pharmacists participated in three SOFYA community workshops with UdeA faculty and students to provide education and training throughout Medellín. PUCOP student grant funds also supported the development of educational materials to market the more than 30 SOFYA workshops and community events, as well as the printing and distribution of health and nutrition games. More than 15 faculty and students from SOFYA and CHEqI also engaged at the SOFYA drop-in centre, located on the UdeA campus, where community members come for education and training. More than 300 UdeA students have developed patient education and training tools that are shared across several platforms including Instagram, TikTok, Twitter, local radio, and campus printing. The next steps include establishing a platform where CHEqI clients can have access to these Spanish-language healthcare education materials.

Conclusion: As part of their APPE, PUCOP student pharmacists have the opportunity to directly engage in SOFYA healthcare programs addressing local health inequities in Medellin. This collaboration between UdeA and PUCOP has enhanced student and faculty language skills and strengthened the approach to addressing SDOH within the respective communities.

Implementation of a comprehensive programmatic framework to address healthcare disparities at an urban metropolitan college of pharmacy in the United States

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Background: Globally, pharmacists are being asked to play a fundamental role in reducing health disparities. Alongside curricular efforts to train pharmacists in community and patient-centred care, academic pharmacy in the United States is working to build a varied pool of enrollees and graduates that can improve health equity. In a challenging enrollment and brand identity environment, academic pharmacy needs examples of how its members are a) increasing awareness about the pharmacy profession in underrepresented communities, b) empowering their students, faculty, preceptors, and alumni to become culturally competent professionals, and c) addressing healthcare disparities through development of an inspired and well-trained workforce committed to improving health equity.

Purpose: To describe a unique multifaceted framework implemented at an urban, metropolitan college of pharmacy to help achieve the following objectives: a) using targeted outreach and strategic partnerships to develop a competitive underrepresented minority (URM) applicant pool; b) increase the URM pharmacists that can engage in providing health care services via a: i) a structured didactic and experiential training curriculum for students and resources to enhance their academic performance, and ii) programs to engage alumni, preceptors and local pharmacists in such initiatives and c) develop structured programs that enhance resources (faculty hiring pool, health disparities research capabilities, curricular information resources) to improve health equity.

Method: A case study approach using the input-process-output model was used to write the goals and objectives for a federal grant. Upon award, the leadership team, for the past two years, implemented and tracked the specific actions taken pertaining to each input variable and its outcome. Quantitative and qualitative data for this time were used and reported.

Results: Since implementation, the programme has: a) represented the pharmacy profession and its educational programme to URM students, pre-health advisors, and faculty at over 200 local, state, and national higher education institutions or healthcare education career events; b) held a summer camp in its first year attended by 19 first/second year college students (majority URM) and slated to be attended by 30 students in its second year; c) granted 40 PharmD students

a substantive tuition remission and stipends award; d) established a health disparities outcomes fellowship program; e) hired a teaching and learning specialist to enhance the College's peer tutoring programme and help improve academic performance of students at-risk; f) held multiple inspirational, mentoring and networking programs for faculty and students where national pharmacy leaders, alumni and local area health education center leaders shared their insights into opportunities for pharmacists in public health; g) sent several faculty and staff to attend a national diversity, equity, inclusion and antiracism conference. Qualitatively, programme participants have indicated programs to be valuable and of high quality. A rollout of an intramural research grant on health disparities and a continuing education programme for local pharmacists is currently underway at the time of writing this abstract.

Conclusion: Data from the first two years demonstrate that comprehensive intentional actions with a health disparities focus can serve as a short- and long-term strategy towards addressing health equity.

Indigenous peoples' experiences with pharmacy education in Canada

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Introduction: Following the release of the Truth and Reconciliation Commission of Canada's Calls to Action in 2015, post-secondary institutions have collectively engaged in decolonisation, Indigenisation, and reconciliation efforts; however, to appropriately respond to the Calls to Action, Indigenous representation in the pharmacy profession is required but remains low and with unclear explanations for the continued underrepresentation. This PhD study examined, for the first time, the holistic experiences Indigenous Peoples have had throughout their first professional degree in pharmacy and offered suggestions for post-secondary pharmacy programs to engage in decolonisation, Indigenisation, and reconciliation. Both current and former First Nations and Métis Peoples gifted their stories to this PhD study with respect to their experiences with pharmacy education in Canada. 27 recommendations for Canadian faculties of pharmacy arose from this study within the areas of recruitment and retention, admissions, curriculum and pedagogy, assessment and evaluation, experiential learning, and general faculty considerations.

Method: This study used Indigenous methodologies and, specifically, the conversational method. Five individuals gifted their stories over three separately scheduled conversations for a total of 15 conversations. Inclusion criteria were self-identification as First Nations, Métis, and/or

Inuit and currently enrolled in, or a former graduate of, an entry-to-practice pharmacy programme in Canada. Analysis was completed using Indigenous Theorising and shared back to participants for their feedback and validation before finalising conclusions.

Results: Three major themes were identified: 1) Isolation, 2) Whiteness and white supremacy, and 3) Incomplete pharmacy curricula. Subthemes and other common experiences included epistemic, systemic, institutional, and interpersonal racism, being 'othered' and tokenised, and not witnessing or learning from Indigenous worldviews and experiences.

Conclusion: Perhaps the most important conclusion and recommendation from this work was that Indigenous Peoples in pharmacy education and practice feel extraordinarily isolated in their places of study and work, are eager to meet and learn from other Indigenous Peoples in pharmacy, and feel a sense of community and belonging. The recommendation that resulted from this finding was that a national organisation should be created for Indigenous pharmacy professionals in Canada, including pharmacy assistants, pharmacy technicians, pharmacists, and students in each of these programs. This critical finding and associated recommendations were prioritised and completed in 2023. 27 recommendations for Canadian faculties of pharmacy arose from this study within the areas of recruitment and retention, admissions, curriculum and pedagogy, assessment and evaluation, experiential learning, and general faculty considerations.

A multidimensional holistic organ specialisation – A deep learning strategy for pharmacy students

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Background: The "Multidimensional Holistic Organ Specialisation" programme represents a pioneering effort to deepen students' understanding and expertise in a specific organ system, encompassing anatomy, physiology, pathology, therapy, pharmacology, toxicology, and business models. This study aims to assess the effectiveness of the programme by analysing student satisfaction, rubric comprehension, and research paper publication rates.

Methods: A mixed-methods approach was employed, utilising pre- and post-programme surveys to gauge student satisfaction and rubric comprehension. Quantitative assessments tracked the percentage increase in satisfaction scores and improvement in rubric comprehension from pre- to post-program. Research paper publication rates were quantified by tracking the number of papers published by

programme graduates within a year of completion. Qualitative data were collected through focus group discussions and interviews to provide nuanced insights into student experiences and challenges.

Results: Quantitative analysis revealed a substantial increase in student satisfaction, with pre-programme satisfaction averaging at 3.58 and post-programme satisfaction at 4.67 on a 5-point Likert scale. Rubric comprehension also exhibited significant improvement, with pre-programme understanding averaging 60.12% and post-programme comprehension at 85.57%. Notably, 70.24% of programme graduates published at least one research paper in peer-reviewed journals within 12 months of completing the program. Qualitative analysis highlighted the transformative impact of the programme on students' professional development, emphasising the value of collaborative learning and practical application.

Conclusion: The "Multidimensional Holistic Organ Specialisation" programme demonstrates remarkable efficacy in enhancing students' knowledge, skills, and confidence in their chosen organ system disciplines. The significant increases in student satisfaction, rubric comprehension, and research paper publication rates underscore the program's success in achieving its educational objectives. By empowering graduates to make meaningful contributions to their fields and the broader healthcare landscape, the programme serves as a catalyst for advancing healthcare excellence in the Asia-Pacific region and beyond.

Application of public health application of public health essentials and innovative strategies into public health for pharmacists required course: Health promotion tool and public service announcement video

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Introduction: Pharmacists' contributions and role in public health have been documented and recognised over the years, especially during the COVID-19 pandemic. Pharmacy education programs have also prepared students to become public health pharmacists. Yet, there are limited educational strategies, especially with regard to the use of technology (e.g., health promotion public service announcement videos), that have been widely shared to enhance pharmacy students' contributions and role in public health.

Objective: To describe the development, implementation and lessons learned from the application of public health

essentials, epidemiology, and innovative teaching strategies in public health for pharmacists required course, specifically health promotion project (HPP) and public service announcement (PSA) video.

Methods: Two group assignments for public health for pharmacists required course were developed with the application of epidemiology, three core functions (assessment, policy development, and assurance) and ten public health essentials of the U.S. Centers for Disease Control and Prevention (CDC). These included the creation of an HPP and a PSA video. For the health promotion project, students used a published health promotion planning instrument called the Assessment, Development, and Assurance: Pharmacist's Tool (ADAPT) to design and plan for implementation and evaluation of an intervention to address a public health problem in an identified community or population. For the PSA video, students created a 3-to-5-minute film on a variety of healthcare topics to increase awareness and provide health education to improve public health.

Results: Students in the first-year professional pharmacy programme attended lectures on public health, including epidemiology and targeting populations, and received instructions for both team assignments of the HPP and PSA video. For the HPP project, there have been a variety of proposed interventions to address public health problems such as asthma, cancer, diabetes, heart diseases, obesity, opioids, smoking, vaping, and more. For the PSA video project, there were many recorded topics, with themes including COVID-19, adult and childhood obesity, colon and lung cancer, sleep health, smoking, vaping, etc., uploaded onto YouTube. Overall, students provided positive feedback on the impact and rewards of these public health projects on both their active learning and outreach to patients and communities.

Conclusion: Implementing innovative active learning strategy or assignments in a public health required course facilitated the opportunity for students to be creative and leverage technology to apply public health topics and provide accurate and reliable health information for patients and populations beyond the classroom. Students' overall perceptions about these projects were positive as they felt more comfortable with public health concepts and are more prepared to apply in practice to address misinformation and provide health education in the real-world.

Dedicated days for interprofessional education - Development of a programme for longitudinal education for interprofessional collaboration

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Introduction: The WHO already recognised the role of interprofessional education (IPE) in 2010 as a necessary step in preparing future healthcare professionals for evolving healthcare needs. Future healthcare professionals are expected to navigate these changes and understand that the complexity and dynamics of society require an integrated approach. This necessitates systems thinking, openness to new perspectives, and experiences from colleagues in other disciplines. IPE significantly contributes to this, as it teaches students the capacities, responsibilities, and tasks of other healthcare professionals. By learning across the boundaries of their fields (boundary crossing), students are trained to act as intermediaries between different 'worlds,' preventing discontinuity and inefficiency in healthcare.

Currently, at Utrecht University, IPE is only offered on a very limited or voluntary basis to students within healthcare programs. Proper guidance is essential for IPE, but teachers and clinical educators lack training in guiding and designing IPE. To address these challenges, a new Utrecht programme is being developed to provide dedicated IPE days for all students in participating healthcare programs.

Methods: The programme aims to guide students through the process of boundary crossing, developing an interprofessional identity alongside their professional identity. An interprofessional identity is necessary for successfully designing and maintaining an interprofessional system. Students will receive education together with students from other programs from year 1 in their bachelor till the end of their master program.

The project is divided into four work packages:

1. IPE development: the programme is structured according to Bloom's taxonomy and Repko's model for interdisciplinary education, with innovative teaching methods suitable for the phase of the program.

2. Teacher development programme in IPE: A short training programme for teachers with theoretical background knowledge on IPE and practical exercises to learn how to guide interprofessional groups.

3. Quality evaluation and research plan regarding the interprofessional longitudinal curriculum and teacher professionalisation program, including the dissemination of acquired knowledge.

4. Governance: Creating conditions for sustainable collaboration for the development and implementation of IPE like agreements and tools integration of IPE into the curricula

Results: Minimal 6 programs will participate in this project. Learning goals for both bachelor and master programs have now been formulated. In the bachelor's phase, the focus is on understanding each other's roles and professions. In the master's phase, the focus shifts to collaboration and practical learning with a move towards complex patient case studies.

The authors trained the education development team and started to identify the teacher's needs for the teacher trainings. In addition, the authors developed teacher profiles for the various stages of IPE.

Conclusion: These efforts represent the initial steps toward educating healthcare professionals in interprofessional collaboration and communication. This longitudinal programme will prepare teachers to adeptly guide IPE and future professionals for collaboration in interprofessional teams and to address complex health issues.

Pharm-Ed: A hospital pharmacy educational and collaborative platform for resource-limited countries

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Introduction: The scarcity of adequately trained pharmaceutical professionals in hospital settings, coupled with limited training opportunities in this domain, poses significant challenges to ensuring access to affordable, high-quality medicines and fostering responsible use in many resource-limited countries.

The Pharm-Ed project (www.Pharm-Ed.net) aims to strengthen capacities of the pharmaceutical staff and to promote performant pharmaceutical services to ultimately ensure quality of care and patient safety.

Methods: The project has two main focuses: (1) the development of a free online educational platform to enhance capacities in various hospital pharmacy aspects. Self-paced online courses were developed, supplemented by a library of resources and practical tools. Furthermore, video tutorials covering pharmacotechnical procedures (e.g., local production of hydro-alcoholic solutions for hand hygiene and safe handling of chemotherapy drugs) have been created. A pre-and post-testing method is used to evaluate learners'

achievement in each course. Learners' perception is evaluated with a satisfaction questionnaire.

(2) Cultivating a network of dedicated pharmacists committed to advancing hospital pharmacy practices in French-speaking Africa.

Results: Ten years after its launch, the platform has garnered more than 3,100 subscribers from over 80 countries. Forty-one lessons organised in 3 programmes are currently available: introductory (6), general (16), and specialised (19). More than 300 resources have been added to the library, and over 17000 downloads have been recorded. 4481 pre-tests and 4348 post-tests were completed with a normalised learning gain of 39% ($57 \pm 21\%$ vs $74 \pm 21\%$ of correct answers; p-value < 0.01). 94% of the participants expressed satisfaction with the learning experience. Furthermore, focal points have been established in nine countries (Benin, Burkina Faso, Cameroon, Democratic Republic of Congo, Madagascar, Mali, Mauritania, Morocco, Senegal) to provide local support to the Pharm-Ed project, including the creation of national networks of hospital pharmacists, collecting and centralising training needs, participating in the organisation of seminars/webinars and advocacy efforts with local health authorities and universities to improve the performance of hospital pharmacy services.

Conclusion: The increasing enrollment and the diversity of the participants underline the global pharmaceutical community's keen interest in the Pharm-Ed project. This initiative represents an original approach to addressing the lack of training opportunities in hospital pharmacies in resource-constraint countries.

Reducing cognitive overload through pre-briefing and worked-out modelling in an interprofessional simulation

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Background: Simulation-based educational techniques are effective for enhancing student critical thinking, problem-solving abilities, professional communication, and interprofessional collaboration. However, simulations are inherently stressful, especially if the simulation environment is new to a student. To facilitate learning, Cognitive load theory (CLT) suggests that educators should optimise the mental load experienced by students. Poorly designed simulations can result in a higher mental load. CLT recommends specific guidance to students and the reduction of unnecessary distractors to ensure that the learner focuses on the learning objectives and expends less energy on irrelevant factors. There are three types of cognitive loads: 1.) Intrinsic load (IL) refers to the difficulty of the learning activity, 2.) Extraneous load (EL) is the working memory required for task completion but one that does not directly impact learning outcomes, for example, written instructions or familiarity with equipment, and 3.) Germane load (GL) refers to the processing of new information into long-term schemata. CLT suggests that educators should optimise IL and enhance GL so that a task is appropriately challenging. Educators should also optimise the instructional design and learning environment to reduce EL. For simulations, strategies such as briefing on available resources and clear instructions on expectations can reduce EL.

Objective: The objective was to compare differences in self-perceived cognitive load between those who received and those who did not receive pre-briefing and worked-out modelling (WOM) prior to a simulation. The hypothesis is that pre-briefing and WOM would reduce EL while optimising GL and IL.

Methods: Final year pharmacy (N=12) and physician assistant (N=41) students participated in a paediatric escape room. Teams were randomised to a control (7) or intervention arm (7). The control group received a short orientation comprising of a team icebreaker and then went straight to the escape room. The intervention group participated in the same orientation and then received a pre-briefing comprising detailed information on the resources in the escape room. They then completed five paediatric cases featuring each disease they would manage in the escape room (WOM). Post-event, students completed the cognitive load assessment scales in simulation (CLAS-Sim) and one question regarding their knowledge of paediatrics on a scale of 1= "much worse" and 5= "much improved". An independent t-test was used to assess differences in the CLAS-Sim between the control and intervention groups.

Results: The intervention arm reported significantly higher IL (control vs intervention 5.83 vs 6.58; *p* = 0.036). The intervention arm reported better GL (control vs intervention 5.49 vs 6.95; *p* = 0.002) and lower EL (control vs intervention 5.03 vs 4.04; *p* = 0.031). On the question about their knowledge of paediatrics, the intervention arm had higher average scores (4.0 versus 3.5).

Conclusions: Incorporating pre-briefing and WOM prior to simulation improves GL and reduces EL but results in higher IL.

Demonstrating the power of artificial intelligence to predict pharmacy student success

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Introduction: Artificial intelligence (AI) has shaken the world of higher education and changed administrative, teaching, and research practices. Schools are seeing the potential of using variables such as admissions data, classroom engagement, academic performance, work experience, and confidence levels to predict student success outcomes upon graduation. However, there are few longitudinal studies on the outcomes of using AI to predict student success in pharmacy education.

Objectives: his study was to bridge this gap by 1) building a multi-step AI model (called AI-SiPS: Artificial Intelligence - Success in Pharmacy School) to identify predictors of student success upon graduation and 2) sharing the results of this model and implications for future practice. A prospective assessment of the utility of this model is presented after the implementation of an intervention based on findings from the model.

Method: AI-SiPS is based on data from a Doctor of Pharmacy programme in the United States using the classes of 2019 to 2022. Data (with key elements in this study in parentheses) include course grades (key therapeutics courses) (n=745 students), a third-year survey on perceived readiness for advanced pharmacy practice experience (APPE) rotations (confidence), work experience (hours per week) (n=261), rotation assignments (positioning of Acute Care APPE) (n=740), and initial professional step after graduation (residency match rate) (n=564).

Data were analysed using KNIME ver. 4.5.1. to examine relationships of postgraduation outcomes (residency match) with 1) APPE rotation order, 2) performance in therapeutics courses, 3) pre-APPE confidence, and 4) work hours. Decision tree analysis showed that higher residency match rates were obtained by students with 1) an early Acute Care APPE (70.2% vs. 58.0%), 2) strong performance in therapeutics courses such as cardiology (77.8% vs. 51.7%), confidence about starting APPEs (77.1% vs. 66.7%), and working 10-19 hours per week (77.5%) compared to working <10 hours (68.2%), or >19 hours (63.6%).

Results: The 2019-2022 results were used to implement changes in the 2022-2023 processes, including earlier identification of students with a desire to pursue residency. These students (n=60) were prioritised to receive an early Acute Care APPE. Preliminary Spring 2024 residency match results for the 84 students who applied for residency revealed that the 60 students prioritised for an early APPE had a higher match rate than the remaining 24 students (42/60 (70.0%) vs.

(14/24) 58.3%). Furthermore, the 42 students in the priority group who had a residency match had better statistics for all three key components of the AI-SiPS model compared to the 18 students in this group who did not match: better academic performance (A in cardiology: 21% vs. 11%), greater confidence (74% vs. 67%), and more appropriate work hours (55% vs. 39%).

Conclusion: Results for the 2024 residency match cycle provide an independent validation of the AI-SiPS model. These findings show how AI-powered predictive models can be used to make programmatic changes to a curriculum to support students' chances of success. The results reveal the importance of understanding students' career goals early on, to provide further support to maximise their chances of success upon graduation.

Engagement of students in an online postgraduate programme in pharmacy

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Background: Online education has become increasingly popular in recent years, with many universities offering postgraduate programs in a fully online format. These programs provide flexibility and convenience for students, especially working students, allowing them to access learning material and participate in discussions from anywhere at any time.

Purpose: The purpose of this study was to examine the engagement of students in an online postgraduate programme in pharmacy practice, focusing on accessing learning material and participating in discussion forums.

Method: The study garnished the data from the reports accessible on the learning management system (LMS). The LMS generates logs of all activities of enrolled students access. Activities related to accessing of teaching material, and participation in discussion forums were extracted for elective modules offered in semester one, 2023 with ten enrolled students.

Results: The data revealed that the majority of students accessed the learning materials regularly. The authors found that students participated in discussion forums; however, submissions were delayed, and there was little engagement between students.

Conclusion: The findings of this study suggest that students in an online postgraduate programme generally engage in accessing learning material and participating in discussion forums. However, participation in discussion forums varied,

with some students actively engaging immediately and others delaying participation. Based on the findings of this study, it can be concluded that while students in an online postgraduate programme generally demonstrate engagement in accessing learning material, their level of participation in discussion forums may be influenced by various factors such as time management, work and family commitments.

Reported experiences and perceptions of gender inequity among pharmacy faculty in the United States

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Background: Gender equity, defined as "fairness of treatment for women and men, according to their respective needs…" is a desired phenomenon in academia, including pharmacy. Past studies have demonstrated a lack of gender equity in pharmacy academia. Though women constitute 51.3% of the full-time faculty in the American Association of Colleges of Pharmacy (AACP), AACP data show inequity in salary between men and women, especially in higher academic ranks. Recent studies have also shown inequity in tenure, national awards, board memberships, etc., where men are more favoured. Women in pharmacy academia have reported less satisfaction with their job and work-life balance.

Purpose: In 2020, the American Pharmacists Association-Academy of Pharmaceutical Research and Science's Economic, Social and Administrative Sciences (APhA-APRS ESAS) Section and the American Association of Colleges of Pharmacy's Social and Administrative Sciences (AACP SAS) formed the Gender Equity Task Force to determine if there is a perception of gender inequity in pharmacy academia. This task force conducted two studies among the three major departments of pharmacy academia – social and administrative sciences (SAS), basic sciences, and clinical sciences. The objective of this presentation is to describe the results from these studies and compare the perceptions of gender inequity between the three departments.

Method: The 19-item survey was adapted from a gender equity project from the University of Texas at Austin. The Qualtrics link to the survey was emailed to all SAS members in APhA and AACP (n = 935). Survey items addressed: experiences with gender inequity as well as when and where it was experienced and perceptions of gender inequity in teaching, research, service, recruitment, mentoring,

leadership, and advancement. For the SAS sample, a 5-point Likert scale was used to assess the directionality of inequity. The survey instrument was validated using Rasch analysis, and the optimised instrument with a 3-point Likert scale indicating inequity favouring men, no inequity, and inequity favouring women was used to study basic and clinical sciences. The Qualtrics survey link was sent to all basic science (n = 791) and clinical science (n = 2567) faculty members of APhA and AACP. Chi-square proportion comparisons were conducted at 0.05 alpha, followed by post-hoc Bonferroni tests.

Results: The survey resulted in 159 responses from SAS faculty, 70 from basic sciences, and 158 from clinical sciences. Most of the respondents from SAS and clinical sciences were women. Seventy-four percent of SAS respondents, 65% of the basic science faculty, and 63% of the clinical science faculty reported experiencing gender inequity, mainly at the Assistant Professor level. More women and Hispanic/non-Whites reported experiencing gender inequity. Gender comparisons revealed that more women felt men were favoured in certain areas of teaching, research service, respect from students, recruitment and advancement (p values < 0.05), and more men responded that there was no gender inequity.

Conclusion: Experiences of gender inequity were reported among all pharmacy faculty groups. Additionally, perceptions of gender inequity favouring men were found among women. The academy should take initiatives to reduce inequities.

Bridging global pharmacy education: The UMES-Sunyani Technical University articulation agreement

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Background: The collaboration between academic institutions from different countries is pivotal in enhancing global pharmacy education. The articulation agreement between the University of Maryland Eastern Shore (UMES) and Sunyani Technical University (STU) in Ghana exemplifies this international educational partnership. This study explores the benefits and challenges of such collaborations, focusing on how they address gaps in resources, training, and global exposure in pharmacy education.

Purpose: This research aims to evaluate the effectiveness of the UMES-STU articulation agreement in fostering educational and professional growth for students from both institutions. The study hypothesises that this agreement significantly improves educational outcomes, cultural

competence, and professional readiness of pharmacy students in both the US and Ghana.

Methods: A programmatic and comparative analysis was conducted to evaluate the impact of the UMES-STU articulation agreement on pharmacy education. This included examining the 3+3 pathway programme for STU students and the clinical experiences of UMES pharmacy students in Ghana. The prerequisites of STU's bachelor programme were compared with UMES's pharmacy programme requirements to assess the efficiency of the articulation agreement in facilitating student progression. Additionally, the study delved into how the agreement has contributed to enhanced curricula, cross-cultural competencies, research collaborations, and resource sharing between the institutions.

To contextualise these findings, a brief literature search was conducted to understand how other schools utilise international articulation agreements. This involved reviewing academic journals, case studies, and institutional reports to draw comparisons and identify trends, challenges, and best practices in international educational partnerships. This comparative analysis provided a broader understanding of the role and impact of such agreements in the global educational landscape, enriching the evaluation of the UMES-STU collaboration. This multifaceted approach offered a comprehensive analysis of the articulation agreement's effectiveness and strategic value in advancing pharmacy education.

Results: Preliminary findings show that UMES students will gain invaluable clinical experience and cultural exposure working alongside clinical pharmacists in Ghanaian hospitals. An enrollment increase for future rotations of 50% was tracked, highlighting the program's growing appeal. STU students benefit from accelerated entry into UMES's pharmacy program, seamless transfer, a clear pathway to gain prerequisites, reduced undergraduate cost, advanced education, and networking opportunities. UMES and STU both benefit from an expanded pool of students, enhanced reputations and partnerships, streamlined admissions processes, diversification of student body, fulfilment of mission and goals, and higher retention and graduation rates. The agreement has enhanced curriculum relevance and cross-cultural competence and has opened avenues for joint research and resource sharing.

Conclusion: The UMES-STU articulation agreement demonstrates a successful model for international collaboration in pharmacy education. It provides mutual benefits by combining resources and expertise, enriching student experiences, and preparing graduates for the globalised healthcare sector. The study suggests expanding similar models to other institutions, enhancing global health perspectives. Future research should focus on long-term career outcomes for participants and the impact on healthcare systems in both countries. This articulation agreement sets a precedent for future partnerships,

contributing to the evolution of a more interconnected and globally competent pharmacy education.

Empowering students as agents of change: A programme review of an interprofessional approach to promoting health equity between a school of pharmacy and health professions

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Background: The Eastern Shore of Maryland is a region grappling with significant healthcare shortages and inequities, designated as both a Health Personnel Shortage Area (HPSA) and a Medically Underserved Area/Population (MUA/P). In response, a prominent institution's School of Pharmacy and Health Professions (SPHP) has committed to addressing these challenges head-on. Its mission focuses on preparing healthcare professionals and advocates equipped to lead transformative change in healthcare through comprehensive education, research, and service initiatives locally and globally.

Purpose: This review evaluates the SPHP's strategic efforts in cultivating an educational environment that prioritises health equity and actively involves students in initiatives that target health disparities. By examining these institutional endeavours, this review aims to assess their impact on student engagement and their development as agents of change within underserved communities.

Methods: This review synthesises data from various sources, including academic publications, programme descriptions, and firsthand faculty and student experience accounts. It focuses on the implementation and outcomes of specific programs developed by the SPHP, such as the Post-Baccalaureate Certificate in Rural Health Disparities and the Rural Health and Health Equity Fellowship, and on the integration of health equity components into the didactic curricula across all programs.

Results: The SPHP's initiatives have led to notable accomplishments, including developing scholarly works on equity, diversity, and inclusion within pharmacy education and successfully acquiring grants for projects to reduce health

disparities. Moreover, establishing a school-wide Diversity, Equity and Inclusion Committee has further underscored the institution's commitment to integrating health equity into its educational programs. However, the progress has faced various challenges, including administrative and faculty changes, logistic hurdles, and a need for widespread support and resources.

Conclusion: Despite facing barriers, the SPHP has made meaningful strides in promoting health equity through education, research, and service. The active engagement of students in advocating for and intervening on behalf of patients in their community, especially during clinical rotations and public health-focused missions, as well as professional development and networking at the FIP World Congress of Pharmacy and Pharmaceutical Sciences underscores the potential of educational institutions in moulding healthcare professionals who are ready and willing to tackle disparities. The SPHP aims to enhance its efforts by introducing new initiatives such as an annual interprofessional event focused on health equity, developing specific health equity courses, and increasing community engagement. Taking the mentioned steps, alongside efforts to secure. additional funding and fostering stronger collaborations with health departments signals a robust path toward empowering students as pivotal change agents in the quest for health equity.

Constructing an educational programme on basic coaching techniques for pharmacy students: Programme evaluation by quantitative text analyses of student-reported process recordings

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Background: People at risk of developing lifestyle-related diseases may find it difficult to independently change their lifestyles. Coaching techniques have been reported as a successful means of supporting such people's lifestyle improvement. Additionally, regular interventions by community pharmacists, who administer medication for such diseases, have been found effective at lowering haemoglobin A1c. However, community pharmacists are often too busy to acquire coaching techniques, as such acquisition generally takes several months.

Purpose: This study aimed to construct an educational programme comprising three lectures and three exercises. The programme enables pharmacy students, who are future pharmacists, to learn and perform basic coaching techniques. Quantitative text analysis of student-reported process

recordings in the 2018 class was used to identify areas for improvement in the class content. The analysis results of the 2019 class were compared with those of the 2018 class to evaluate whether the 2019 programme had improved.

Method: In 2018 and 2019, 143 and 139 fourth-year students, respectively, attended the class within the Faculty of Pharmacy and Pharmaceutical Sciences at Fukuyama University (Japan). In each year's classes, a lecture and an exercise (90 minutes each) were conducted consecutively three times biweekly from September to November. The students learned basic coaching techniques in the lectures and supported other students in pairs in exercises implementing the techniques. The students then entered details of their support in process recordings for self-reflection. After obtaining students' consent, the process recording contents were quantitatively analysed using KH Coder 3® software.

Results: In 2018 and 2019, 139 and 109 students, respectively, gave their consent to participate in this study. Few students in 2018 properly conducted coaching following the coaching flow (i.e., conducting the following steps in the order: setting up, understanding the current situation, identifying the ideal state, understanding gaps, planning specific actions, and evaluating) during the first exercise, though more followed this flow during the second and third exercises. Based on the 2018 results, class materials were added and carefully explained regarding how to better conduct coaching. These steps led to an increased number of students in the 2019 class who conducted coaching following the flow, even during the first exercise.

Conclusion: These findings show that, by further improving the class contents using student feedback, it was possible to formulate a class in which students could obtain basic coaching techniques.

Evolution of pharmaceutical education in Mexico in the last 10 years

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Introduction: In Mexico, Higher Education Institutions (HEIs) have been involved in the education agreements that contain the signatures of the Free Trade Agreements that the country signed, especially the NAFTA, today USMCA (Agreement between the United States, Mexico and Canada), a series of organisations emerged that are in charge of supervising and managing the way in which these agreements are applied in each area. In education, more specifically in professional services, the pharmacy profession had to contemplate

homologation, accreditation and certification processes that were foreign to its culture. From that moment on, the HEIs and organisations have carried out action plans in the area of Pharmacy, achieving significant progress in improving the quality of their programs, taking the activities that reinforced their profile and rejecting those not pertinent to their environment with the aim of training excellent pharmacists. Assuming the national and international agreements, the observations of the bodies that are responsible for supervising and managing these agreements in Pharmacy have been included in their programs. These include the trend of accredited programs, the recommendations for the recognition of degrees, and the observations of the Technical Committee on Pharmaceutical Education in the Ministry of Public Education.

Objective: Update and quantify the number of HEIs, academic programs and enrollment in the area of Pharmacy, in order to know the evolution of Pharmaceutical Education in Mexico.

Method: From the information collected from the National Association of Universities and Institutions of Higher Education (ANUIES), the HEIs, academic programs and enrollment in the area of Pharmacy during the last ten years were filtered, quantified and analysed by region.

From the information collected from the Mexican Council for the Accreditation of Pharmaceutical Education, A.C. (COMAEF), the academic programs accredited during the last ten years were quantified.

Results: It was identified that in 2013, there was a national enrollment of 29,288 students, distributed in 48 HEIs, in its 63 faculties that granted 68 academic programs in the area of Pharmaceutical Sciences. For the 2022 school year, it is observed that there was an increase of 32% in national enrollment, 26% more HEIs; and that 28 academic programs were implemented in 25 faculties that were created with respect to 2013, so the evolution of Pharmaceutical Education has increased. As of November 2023, of the 96 current programs, 42.7% have been accredited, which is equivalent to 41 academic programs.

Conclusions: The authors identify that during the last ten years, the HEIs in the area of Pharmaceutical Sciences have diversified the educational offer at the national level; along with this, the improvement and quality of their academic programs guarantee their graduates to develop competencies, and knowledge and skills that allow them to enter the labour market as a better professional in the areas of Hospital Pharmacy, Community Pharmacy, Pharmaceutical Care, Design and production of drugs among others.

Foundation for pharmaceutical education in Mexico A.C-Fefarm

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Introduction: After careful strategic planning by HEIs and professional pharmaceutical organisations to determine the bottlenecks of professional training in Hospital Pharmacy, it was decided to form a foundation that could support solving these needs. The data obtained elaborated the Mission of the FEFARM which is to grant scholarships for study or short-term stays in pharmacy and in related areas, through a public call that will not be supported by government institutions. It has a vision of dynamic and inclusive organisation, both national and international scope, integrated by pharmacists who identify with the mission and institutional values, open to coordinate efforts in pharmaceutical matters with other public and private organisations.

Objective: It is to analyse the data obtained from quantifying the number of applications received for Support Scholarships in Bachelor's, Specialty, Master's and Stays of the FEFARM, which indicate if the Foundation is having the expected impact.

Methods: An analysis was carried out by Higher Education Institutions (HEIs) and regions of the applications received and the granting of FEFARM scholarships to students of the careers in Pharmaceutical Sciences.

Results: FEFARM has received 2,094 applications for scholarships to support bachelor's degrees, specialty, and master's degrees and stays from 41 HEIs and 53 Faculties; 26.2% corresponds to the Central West region, 22.3% to the South Southeast, 20.8% to the Metropolitan, 14.8% to the South Central Region, 12.5% to the Northeast, 2.5% to the Northwest and 0.8% without data; has awarded 349 scholarships equivalent to 16.7% of the total applications received, 39.5% to Metropolitan, 20.3% to South Southeast, 15.5% to South Central, 13.5% to Central West, 9.2% to Northeast and 2.0% to Northwest. The initiative "Pharmacists taking care of these Pharmacists within the Health Team" was highlighted to support during the pandemic.

Conclusions: It is important to note that, since November 2019, the Foundation has granted specific support to pharmacists in training, contributing to their academic improvement according to their testimonies and the opinions of the involved institutions.

Impact of low-cost capstone simulations on student knowledge and confidence in managing cardiovascular diseases

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Introduction: Therapeutics courses provide foundational knowledge regarding disease management. Simulations can be a powerful tool for training students how to identify, assess, and treat disease. Additionally, they can illustrate disease progression. The objective of this study was to assess the impact of capstone simulations on student knowledge and self-confidence in managing cardiovascular diseases.

Methods: Second-year pharmacy students enrolled in a Cardiovascular Therapeutics course were eligible for this study. All course content was taught by week 12 of the 14-week trimester and assessed on one of three multiple-choice exams administered on ExamSoft. The subsequent two weeks were utilised for timed and graded in-class capstone simulations. Three video games were created in Twine and hosted in itch.io, depicting 1.) ischemic stroke, 2.) heart failure (HF), and 3.) venous thromboembolism (VTE). Twine was chosen as it is an open-source software product which can be used for the development of interactive and nonlinear stories. The video games were hosted on itch.io, which is a free website that allows users to host video games on their platform. Finally, a high-fidelity mannequin depicted HF and atrial fibrillation. Each patient also had additional past medical history, such as hypertension, hyperlipidemia, and coronary artery disease. Instructors led a debrief after each simulation. At the end of the course, a multiple-choice final exam was administered. Exam questions were categorised by disease and performance on exams I, II, or III, which were compared to the final. A mixed-methods approach was used to assess self-confidence. All students completed a pre/post-self-confidence survey on a Likert scale of 1-5, with 1= not at all confident and 5= very confident. Fifteen students also participated in pre-/post-simulation focus groups. Focus group statements were coded by independent analysts, and a thematic analysis was performed. A paired t-test was used to analyse the confidence surveys.

Results: A total of 486 students participated in this study. Significant improvements were observed in confidence levels for managing all diseases covered in the simulations. Exam scores improved for questions related to HF (52.9% versus 66.5%) and stroke (61.9% versus 71.5%) but not VTE (72.9% versus 71%). Post-simulation focus groups (34 statements) revealed increased confidence in assessing disease states, creating tailored therapeutic plans, and improving advanced pharmacy practice experience (APPE) readiness. However, students mentioned that the timed aspect of the simulations caused added stress.

Conclusion: Low-cost capstone simulations were successful in improving student confidence and exam performance.

Production of hand sanitiser during COVID: An academic's story

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Introduction: In 2020, the globe shut down due to the COVID-19 pandemic. As an academic, University space and other resources were used to convert a teaching facility into a small manufacturing unit to produce hand sanitiser according to the WHO formula, which was supplied to health care and other facilities in the Eastern Cape Province.

Method: All raw materials were sourced from partners such as the Eastern Cape Department of Health (ECDoH), the South African Institute of Aquatic Biodiversity (SAIAB), and Rhodes University. All batches were manufactured using a Batch manufacturing record and tested for alcohol content. Initially, only 25 L was manufactured at a time until such time as sufficient numbers of containers had been found and calibrated, at which point 300 L of sanitiser could be manufactured at any one time. Following testing, the sanitiser was packed into 5 or 25 L recycled containers that had been cleaned. The sanitiser was distributed to hospitals, clinical settings, and other sites by the ECDoH. The production of sanitiser has now become a component of an Industrial Pharmacy elective course in the Faculty. Several partnerships were established to ensure the sustainability of production during the pandemic. The product was labelled and packed into 5 and 25-L containers that had been cleaned thoroughly before use. The finished product was stored in a laboratory in which the air temperature was 15°C. Compliance certificates from the local fire department were issued for this purpose. Documentation was retained for the purposes of reconciliation of raw material use and he South African Revenue Services.

Results: To date, over 15,000 L of hand sanitiser has been produced in the facility by and for partners. The first 50 L were manufactured on 20 March 2020 and packed into 1L containers. On 26 March 2020, a batch of 150 L is produced, and soon thereafter, 300 l batches are produced. At peak production, 900 L was made in a day. Three groups of elective students participated in the production of hand sanitiser and had to determine to who they would donate the sanitiser. The Dhone Research Institute of the Department of Rural Development and Agrarian Reform brought scientists for training in sanitiser production and made sanitiser at their facilities, under their direction, after completion of training.

Conclusion: The production of hand sanitiser in a time of need ensures that front-line workers in the public sector have

access to suitable products. The inclusion of hand sanitiser production in an elective course for 4th-year pharmacy students ensured that they had insight into the requirements for documentation and control in respect of the production. The ethical dilemma of who should receive hand sanitiser forms part of their learning. Retrospectively, what has been achieved in a short space of time with limited resources reveals that with courage and conviction, pharmacists and pharmacies can make a difference in health care due to their education and training, and academic pharmacy forms part of that continuum.

Adapting pharmacy education for equity and inclusion: A 25-year evolution of the community engagement programme at Rhodes University

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Introduction: The Community Engagement Programme (CEP) at Rhodes University, South Africa, represents a significant initiative in the evolution of pharmacy education towards embracing equity and inclusion. Initiated in a period marked by a sharply divided healthcare system and a transitioning societal landscape, the CEP has undergone substantial transformations to address the changing needs and demographics of its student body while also striving to mitigate persistent healthcare disparities in the country. This paper delves into the 25-year journey of the CEP, showcasing its adaptability and the shift in its educational approach in response to South Africa's changing student demographics and health environment.

The CEP was initially designed to expose pharmacy students, mainly from white and Indian backgrounds, to the living conditions and health challenges faced by the predominantly black population. Over the past 25 years, the programme has evolved, reflecting not just the changing demographics of its students but also a broader understanding of the role of pharmacy education in fostering social responsibility and equity.

Methods: The study employed qualitative research methods, including an analysis of programme documentation and in-depth interviews with key stakeholders involved in the CEP. This methodological approach facilitated a comprehensive analysis of the programme's pedagogical evolution from its initial focus on Kolb's experiential learning framework to a more integrated service-learning approach. This transition is particularly significant in light of the shift in student demographics from predominantly white and Indian in 1999 (15%) to predominantly black-African by 2022 (84%), who bring a lived experience of the healthcare challenges the programme aims to address.

Results: Initially, the CEP aimed to provide pharmacy students with a passive observational experience of healthcare realities. However, with the demographic shift and direct experiences of the students themselves, the programme has been restructured towards active engagement and hands-on service provision. This transformation is facilitated through collaborations with public health services and the community, where students contribute to health service delivery via a faculty-operated mobile health unit. This approach not only enhances the students' practical skills but also instils a sense of social responsibility by delivering real benefits to the rural and semi-rural communities served.

The transition to a service-learning pedagogy within the CEP has had profound implications for both the educational experience of the students and the communities they serve. This pedagogical shift reflects a broader understanding of the role of pharmacy education in bridging healthcare disparities and promoting equity.

Conclusion: The evolution of the CEP at Rhodes University underscores the importance of the need for educational programmes to adapt to reflect changing student demographics, societal shifts, and healthcare challenges. This case study exemplifies the role that pharmacy education can play in advancing social responsibility, equity, and inclusion, preparing future pharmacists as catalysts for positive change in the healthcare system.

Educators' perspectives on the use of generative AI in pharmacy education: An extended unified theory of acceptance and use of technology

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Introduction: AI has revolutionised how we perceive, cognise, learn, and make decisions within healthcare education and practice. More AI generative tools and applications are becoming available for pharmacy students and educators for various uses. While these tools could be significant assets for doing academic tasks efficiently, several concerns, experiences, and perspectives govern their current and future use in pharmacy education. Therefore, this study aims

to examine the acceptance of generative AI-based technology, determined by the effects of performance expectancy, effort expectancy, social influence, and facilitating conditions.

Methods: A cross-sectional survey was conducted among pharmacy educators in different countries: the United Kingdom, Turkey, Nigeria, Malaysia, Pakistan, Egypt, Iraq, Saudi Arabia, and the United Arab Emirates. A survey instrument was developed and informed by the theoretical framework provided by the extended version of the Unified Theory of Acceptance and Use of Technology (UTAUT). Data was collected online through study co-investigators in each country between February 1st and March 15th, 2024. Descriptive statistics were employed to present key data in frequencies and percentages.

Results: Preliminary findings showed that 216 responses were received, mainly from females (67%), with 41% in their first five years of academic experience. Over one-third of the responses were from clinical pharmacy and pharmacy practice disciplines. The vast majority (68%) have both teaching and research commitments. Regarding the frequency of using academic AI tools, Quillbot was ranked first as a very frequent tool (N=59), followed by ChatGPT (N=56). Concerning the acceptance and use of generative AI based on the UTAUT model, over two-thirds of participants positively perceive the usefulness of generative AI in their academic lives (performance expectancy). About 50% reflect positively on the ease of adopting AI for their academic tasks (effort expectancy), while 48% reported being influenced to use these tools through their social networks (social influence). Only 25% (N=54) highlighted a clear university policy on using generative AI among students and academics, while 64% expressed concerns regarding the misuse and overuse of generative AI tools for academic purposes. Although 42% agreed that generative AI tools are valuable for money, only 29% reported that they are affordable to pay for their required tools. In addition, 41.2% disagree that they become addicted to using AI generative tools; meanwhile, about 59% intend to continue using generative AI tools in their future academic careers. Finally, in response to an open-ended question on generative AI in pharmacy education, educators provided insights into the need for plagiarism-like regulations and guidance, a lack of awareness of the potentially useful applications, the risk of reducing cognitive and critical thinking abilities, and the need for training on the responsible use of generative AI in academia.

Conclusion: The adoption of generative AI among pharmacy educators seems to be perceived positively in terms of expected performance, effort, and willingness to continue using it in the future. However, they are still concerned about the affordability of paid tools and their potential misuse, particularly with the lack of clear university policy to govern this adoption among students and educators.

Self-perceived mental health, resilience, and attitudes towards distance education among pharmacy students: A survey from a country with crisis during COVID-19

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Introduction: Both the mental health of students and the higher education landscape have been considerably affected by the shift to remote learning during the COVID-19 pandemic. In Lebanon, this shift was compounded by the effect of a severe national economic, financial, and social crisis. The objectives of the current study were to assess the mental well-being of pharmacy students almost one year after the start of the pandemic and remote education, to evaluate their resilience, and to explore their satisfaction regarding distance education.

Method: The study was conducted using a descriptive, anonymous, self-administered, voluntary, cross-sectional survey, incorporating the following sections: students' sociodemographic data, the Depression, Anxiety, and Stress Scale-21 Items (DASS-21) for gauging depression, anxiety, and stress, the Brief Resilience Scale (BRS) for resilience, and the students' attitudes towards distance education during COVID-19. Descriptive, bivariate, and multivariable analyses were employed using SPSS, and a p-value of <0.05 was considered statistically significant.

Results: A total of 561 pharmacy students participated in the survey. The prevalence of at least mild self-perceived depression, anxiety, and stress were 64%, 71%, and 48%, respectively. Also, 27%, 37%, and 18% of participants expressed severe-to-extremely severe self-perceived depression, anxiety, and stress, respectively. Self-perceived severe to extremely severe depression was associated with smoking (p = 0.01), weight gain during the pandemic (p > 0.001), and feelings of isolation (p > 0.001). Self-perceived severe to extremely severe anxiety was associated with weight gain during the pandemic (p = 0.04), being in the last year of pharmacy school (p = 0.03), and feelings of isolation (p = 0.009). Self-perceived severe to extremely severe stress was associated with the use of antidepressants and/or anxiolytics (p = 0.007) and feelings of isolation (p = 0.004). Approximately 40% of students displayed low resilience

associated with smoking, being in the third or fourth year of pharmacy study, and having lower family income. The average satisfaction score with online learning was 60.3 ± 21.3%, with the highest satisfaction being for the use of technology in education and the lowest being for remote delivery of laboratory courses, simulation, and pharmacy practice experiences.

Conclusion: The levels of depression, anxiety, stress, and low resilience among pharmacy students were remarkable and multifactorial, with various significant associations related to lifestyle, demographic, and educational factors. In a country with a multi-faceted collapse, there is a need to purposefully explore the well-being of pharmacy students, ascertain the long-term mental effects of the pandemic and the crisis, and take the necessary precautions to support the mental health and resilience of pharmacy students.

Developing core concepts in pharmacy administration and leadership training

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Introduction: Understanding core concepts within a discipline is essential in allowing educators to focus and align their curricula, teaching, and assessment effectively and efficiently. There is limited research on the core concepts of healthcare administration and leadership, especially within pharmacy. Consequently, this lack of consensus prevents consistency among training programmes teaching pharmacy administration and leadership (PAL). The purpose of this two-phase study is to identify and define the core concepts essential for PAL training.

Methods: Phase one reviewed PAL master's programmes and healthcare management master's programmes accredited by the Commission on Accreditation of Healthcare Management Education in the US through a website analysis. Through this website analysis, mission and vision statements, learning outcomes, core competencies, and course details were assessed. Inductive coding was employed to identify recurring themes for the development of a consensus draft list comprising core concepts pertinent to PAL.

Phase two used a modified Delphi process involving individuals practising in PAL across the US. Structured surveys gauged expert opinions and consensus on the draft core concepts. The initial survey was distributed via ASHP Connect, with subsequent surveys sent to past respondents, both

asking respondents to assess each concept, endorse or reject the concept, and provide feedback. Consensus was determined at an 80% endorsement threshold.

Descriptive statistics were used to analyse respondent demographics and consensus. Additionally, free-response feedback for each core concept was subjected to content analysis, facilitating iterative refinement and validation of the core concept and definition. This analysis was then used for the development of subsequent surveys. This iterative process continued until consensus was achieved, ensuring the comprehensive exploration and validation of core concepts in PAL training.

Results: Phase one involved a review of program components from 147 PAL and healthcare management master's programmes which comprised 9 Masters in PAL (6.1%), 71 MBA (48.1%), 61 MHA (41.5%), and 6 MHSA/MSHA (4.1%) programmes. Through inductive coding, 13 themes emerged across the analysed program components, serving as initial core concepts. Definitions for each concept were developed through a consensus process amongst investigators.

The phase two survey instrument initially received 110 responses, with 25 excluded due to incompleteness (n=85). In terms of respondents' training and current workplace, 50.6% (43) held a master's in PAL or healthcare management, 34.1% (29) completed PAL residency or fellowship, 24.7% (21) indicated completion of a PAL certificate or training programme, and 84.7% (72) worked in an academic medical centre or community hospital. The initial survey revealed an average endorsement rate of 90.8% for the core concepts and definitions (SD=6.6%). Endorsement rates and feedback were iteratively used to refine the core concepts in subsequent surveys with the same 85 respondents until a consensus was reached.

Conclusion: By identifying core concepts through expert consensus, this research contributes to the standardisation and improvement of pharmacy administration and leadership training and will serve as evidence-based resources, assisting aspiring administrators and leaders in acquiring essential skills and knowledge. Establishing a common understanding of core concepts will facilitate the development of competent leaders capable of addressing contemporary healthcare challenges.