FIP Nanjing Statements

Shaping pharmacy and pharmaceutical sciences education to 2030

Guidance document

2024

FIP Development Goals

fip International Pharmaceutical Federation

Colophon

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Introduction

Drivers and purpose

The International Pharmaceutical Federation (FIP) aims to ensure everyone has access to safe, effective, and quality medicines, relevant health information, and benefits from new medicines, services, and health technologies. A focus on the provision of appropriate and timely pharmaceutical education is crucial to equip future pharmacists with the knowledge, skills, attitudes, values and attributes to fulfil their roles in this mission on local, regional and global levels.

FIP is committed to advancing the pharmacy profession globally by advancing pharmacy and pharmaceutical sciences education, as demonstrated by its unwavering commitment and leadership in the field. This commitment is further reinforced through FIP's strategic collaborations with international organisations such as the United Nations Educational, Scientific and Cultural Organization (UNESCO) and the World Health Organization (WHO), highlighting its pivotal role in shaping global health and education.

By collaborating with key global partners, proactively setting strategic goals, and continuously adapting to the evolving needs of the health sector, FIP ensures that the pharmacy profession remains responsive, effective, and integral to global health outcomes.

FIP's initiatives, activities, events, and key launches are central to its mission of advancing workforce education and development. To gain deeper insights into these transformative efforts to date, readers are encouraged to explore the Global Workforce Symposium: "Accelerating towards 2030 — Workforce Transformation for Better Health – The Brisbane Review. Additionally, the recent FIP Brisbane Calls to Action represent a pivotal mid-term milestone between the 2016 FIP Global Conference on Pharmacy and Pharmaceutical Sciences Education in Nanjing, China—which set forth a global vision for a competent pharmaceutical workforce—and the Nanjing Statements on Pharmacy and Pharmaceutical Sciences Education, aligning with the WHO's Global Strategy on Human Resources for Health: Workforce 2030 ambitions. These resources offer a comprehensive look into how FIP is actively shaping the future of pharmacy.

For an overview of FIP's milestones in this education and workforce transformation journey, please refer to the timeline in Figure 1.

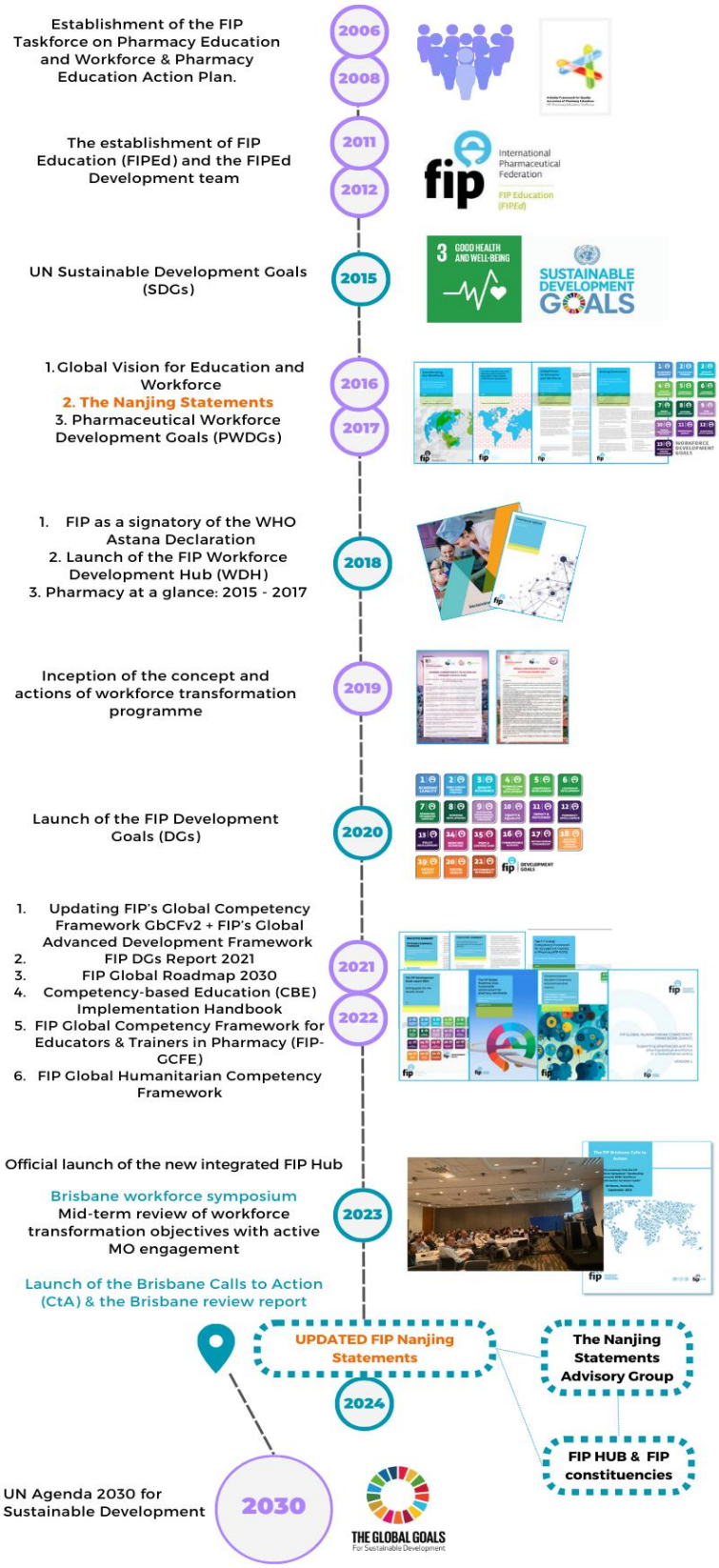

Figure 1: Timeline of key education and workforce transformation milestones in FIP's journey towards achieving the objectives outlined in the 2030 UN Agenda for Sustainable Development

Additionally, FIP's contributions through various publications have laid a strong foundation for the development, evolution, and transformation of pharmacy and pharmaceutical sciences education worldwide. Notable initiatives and publications include:

- **1972:** FIP's recognition and focus on pharmaceutical education began with the establishment of the Academic Pharmacy Section.
- **2006-2009:** Global consultations led to the creation and implementation of a Pharmacy Education Action Plan.
- **2011-2012:** The establishment of FIP Education (FIPEd) and the FIPEd Development team.
- **2016-2017:** Significant advancements were made, with the notable Global Conference on Pharmacy and Pharmaceutical Sciences Education in Nanjing, China, resulting in the establishment of 13 Pharmaceutical Workforce Development Goals (PWDGs) and the Nanjing Statements.
- **2019:** Reorganisation of FIP workstreams, regional conferences, and the signing of an MOU with WHO to intensify their long-standing collaboration.
- **2000:** FIP Policy Statement on Good Pharmacy Education Practice: This document outlines ~~the~~ pharmacists' evolving roles in healthcare, emphasising their responsibilities in medication management, patient care, and the need for continuous professional development in the pharmacy field.
- **2014:** Continuing Education in Pharmacy: Global Report: This report emphasises the shift from traditional continuing education to a more comprehensive Continuing Professional Development (CPD) model in pharmacy, highlighting its importance for ongoing professional competence and the need for accessible resources and training to successfully integrate CPD into pharmacy practice worldwide.
- **2016:** Global Vision for Education and Workforce: This publication focuses on enhancing global health by evolving the pharmaceutical workforce through adaptable and flexible education and training, ensuring responsible use of medicines, and promoting collaborative healthcare practices, with an emphasis on continual professional development and global leadership in healthcare challenges.
- **2016:** Pharmaceutical Workforce Development Goals (PWDGs): These provided a global vision and framework for advancing the pharmaceutical workforce in areas such as education, competency, leadership, and more.
- **2016:** FIP Global Advanced Development Framework: A validated tool is designed to support the professional development and recognition of the pharmacy pharmaceutical workforce.

- **2017:** Pharmacy at a glance: 2015-2017: This summative report outlined the global evidence base for the contribution of pharmacy to the health workforce agendas. It presented data about the global pharmacy workforce and discussed the achievements and challenges of FIP's work on workforce development, education, and transformation.
- **2017:** The Nanjing Statements on Pharmacy and Pharmaceutical Sciences (2017): These were 67 statements that described the envisioned future for education, aiming to enhance professional education standards worldwide.
- **2020:** Release of updated FIP frameworks and the launch of FIP Development Goals.
- **2021:** The FIP Development Goals Report 2021, Setting goals for the decade ahead: This report provides a global status update on the FIP Development Goals one year after their launch.
- **2021-2022:** A focus on implementing and tracking the progress of the Development Goals, publishing a global roadmap to 2030.
- **2022:** FIP Global Competency Framework: This validated framework acts as a "mapping tool" for individuals, aiming to guide them towards effective and sustained performance, and to support their journey into advanced practice.
- **2022:** FIP Statement of Policy on Continuing Professional Development: This policy emphasises the importance of lifelong learning for pharmacists, outlining the need for continuous professional development to adapt to evolving healthcare challenges and ensure safe, effective patient care, supported by structured educational activities and a commitment to maintaining professional competence throughout their career.
- **2022:** FIP Statement of Policy on Quality Assurance of Pharmacy Education and Pharmaceutical Sciences Education: This statement describes standards for assuring the quality of pharmacy and pharmaceutical sciences education, at a time when additional roles for pharmacists are increasingly recognised, and many countries have undertaken a major transformation of pharmacy and pharmaceutical sciences education.
- **2022:** FIP Global Roadmap to 2030: This roadmap provides strategic insights into FIP's future vision for transforming pharmacy on a global scale, aligning with the United Nations' 2030 Sustainable Development Agenda.
- **2022:** The FIP Global Competency Framework for Educators & Trainers in Pharmacy (FIP-GCFE): A tool to support advancement and competence development for our colleagues around the world, serving in any sector of pharmaceutical education. It was initiated by the Academic Pharmacy Section of FIP and created in collaboration across FIP, involving our leads, experts, and volunteers across the Federation.

- **2022:** Competency-based education in pharmacy and pharmaceutical sciences: A FIP handbook to support implementation of competency-based education and training: This handbook provides step-by-step guidance for educators to implement competency-based education (CBE) concepts in their initial pharmacy education and training. It also supports the implementation of CBE concepts in continuing professional development, post-graduate programmes and other lifelong learning settings. The handbook helps to achieve FIP Development Goal 5 (Competency development), with major relevance to Development Goal 1 (Academic capacity).

The above-mentioned publications represent the continuation and drivers of FIP's commitment to empowering our individual and institutional members, focusing on those involved in creating, delivering, and assuring the quality of pharmaceutical education.

Building on these foundational works, FIP formed a dedicated Nanjing Statements Guidance Document Advisory Group in 2022 to update and revise the Nanjing Statements of pharmacy and pharmaceutical sciences. This revision aimed to align the statements with the emerging and aspirational health needs of our communities. The advisory group comprised members from across the six WHO regions, providing critical regional and global insights essential for refining the Nanjing Statements. Through its diverse membership, the group brought unique perspectives and addressed regional challenges, thereby enriching the global understanding of pharmacy education.

To further illustrate the impact and diversity of the advisory group's contributions, examples of key publications stemming from each WHO region are highlighted below:

1. African region: International Pharmaceutical Federation (FIP). FIP pharmacy education in sub-Saharan Africa. The Hague: International Pharmaceutical Federation; 2020. https://www.fip.org/file/4812
2. Region of the Americas: Eiland LS , Brown TR, Enderby CY, Luchen G, Smith WJ, Trovato JA, Chisholm-Burns MA, The ASHP Section of Pharmacy Educators Crystal Ball project: Insight into the future of pharmacy education, *Am J Health-Syst Pharm*, Volume 80, Issue 4, 15 February 2023, Pages 236–241, https://doi.org/10.1093/ajhp/zxac332
3. South-East Asia region: Suwannaprom P, Suttajit S, Eakanunkul S, et al. Development of pharmacy competency framework for the changing demands of Thailand's pharmaceutical and health services. *Pharm Pract (Granada)*. 2020;18(4):2141. doi:10.18549/PharmPract.2020.4.2141

4. European region: Moura L, Steurbaut S, Salvesen Blix H, et al. A cross-sectional survey to map Clinical Pharmacy Education and Practice in Europe. *Int J Clin Pharm*. 2022;44(1):118-126. doi:10.1007/s11096-021-01321-3
5. Eastern Mediterranean region: Obaid D, El-Dahiyat F, Babar ZU. Pharmacy practice and clinical pharmacy research in the Middle East: a scoping review of studies from Bahrain, Iraq, Jordan, Kuwait, Lebanon, Oman, Palestine, Qatar, Saudi Arabia, Syria, United Arab Emirates, and Yemen. *J Pharm Policy Pract*. 2022;15(1):40. Published 2022 Jun 8. doi:10.1186/s40545-022-00434-y
6. Western Pacific region: Kawaguchi-Suzuki M, Law MG, Prisco J, Head K, Fu L, Yumoto T, Kamei J, Yang M, Cheng K J, & Hogue MD. (2019). Cultural Sensitivity and Global Pharmacy Engagement in Asia: China, Japan, South Korea, and Taiwan. *Am J Pharm Educ*, *83*(4), 7214. https://doi.org/10.5688/ajpe7214

These publications provide valuable insights into the diverse landscape of pharmacy education and healthcare across different regions, allowing the advisory group to develop well-rounded and globally inclusive recommendations for advancing the pharmacy profession. Additional publications recommended by the advisory group are listed in Appendix A.

Future outlook to 2030

As FIP continues its journey to advocate, represent, and enable the different sectors, types, and sections of pharmacy, pharmaceutical sciences, and pharmacists, the next decade is crucial for its further progression. Reflecting on the legacy work and major milestones achieved in the past century, the future of FIP will be a beacon for advancing the pharmacy profession and ensuring global health.

FIP's commitment to global health resonates strongly with the imperatives laid out in the FIP strategic plan (2019-2024), emphasising access to medicines, health, and medicines-related information, and the benefits of new medicines, services, and health technologies. These outcomes closely align with the WHO 2030 targets for ensuring healthy lives for all. The necessity of high-quality pharmacy and pharmaceutical sciences education is underscored by the United Nations' Sustainable Development Goals, particularly Goal 4, which champions inclusive, equitable, culturally safe, quality education and lifelong learning.

These global aspirations for better health through better education and workforce development are intricately intertwined with the FIP Development Goals (DGs). For example, DG1 focuses on academic capacity building, DG2 relates to early career training strategy, DG3 highlights quality assurance, and DG9 emphasises continuing professional development strategies. These goals highlight our global vision of linking undergraduate pharmacy and pharmaceutical undergraduate education and professional development activities to health policy initiatives, pharmaceutical career development pathways, and ensuring continuous education opportunities are embedded in the paradigm of lifelong learning. The roadmap to 2030 is marked by these significant milestones in pharmacy and pharmaceutical sciences, as FIP continues to navigate changing landscapes, adapt leadership, and strengthen global partnerships for the advancement and transformation of the pharmacy profession.

Additionally, in alignment with the WHO Working for Health 2022-2030 Action Plan, FIP emphasises the importance of planning and financing, education and employment, and protection and performance. The programmes of work are key enablers for delivering the Global Roadmap 2030, reflecting FIP's commitment to global health and development.

In conclusion, as we progress towards 2030, FIP remains steadfast in its mission to champion global health by fostering the advancement of pharmacy practice, pharmaceutical sciences, and education, comprehensively linking with global health goals, and leveraging the power of collaboration. This vision is shared by leaders in the field like the advisory group on Nanjing Statements, who, through their leadership, are contributing to the shaping of future strategies in pharmacy education, emphasising academic excellence, quality student experiences, and a culture of engagement and sustainability.

Nanjing Statements on pharmacy and pharmaceutical sciences education – Guidance document

Purpose and intention of the statements

The Nanjing Statements on Pharmacy and Pharmaceutical Sciences Education describe the envisioned future for pharmaceutical education needed to enhance professional standards worldwide.

The Nanjing Statements are intended for education providers, including educational institutions of Pharmacy and providers of Continuing Professional Development and Continuing Education. They are to be used for the purposes of self-assessment and monitoring (at country level or at the education provider level), identification of gaps and strategic planning, and improving the process of education. The 2016 initial Nanjing Statements underwent extensive consultation and validation processes before, during, and after the Global Conference.

Initial development of the 2016 FIP Nanjing Statements

The original Nanjing Statements on Pharmacy and Pharmaceutical Sciences Education were developed by FIP in 2016, in Nanjing, China, to guide the process of educational reform. The Global Conference on Pharmacy and Pharmaceutical Sciences Education - "Creating a global vision for a global workforce" Planning Committee set up a Working Group dedicated to the development of the original draft Nanjing Statements. This draft list of statements underwent extensive review by the Planning Committee, FIP Bureau, FIPEd, BPP and BPS, and expert groups to ensure a balanced representation of science and practice. The first draft comprised a total of 80 statements grouped into eight clusters.

Purpose of this revision

The purpose of this Nanjing statements guidance document is to provide a broad overview of how the pharmacy profession and educators should approach pharmacy and/or pharmaceutical science education in general. The intention is not to provide specific curriculum suggestions or recommendations but rather to guide countries and regions in adapting the statements to their specific needs and contexts by referring to more detailed competency documents already published by FIP. The advisory group focussed the revision on multiple contextual factors, including recent significant global health events such as the COVID-19 pandemic, the different manifestations and development of the pharmaceutical workforce worldwide, the evolving state of higher education in different regions, and the varied ways in which the pharmacy support workforce might be defined and utilised globally. In addition, the revisions took into account

updates from different WHO regions regarding the current state of health, desired goals and outcomes of pharmacy education, and the forecasted nature of the future of pharmacy practice and pharmaceutical sciences. Furthermore, it was recognised that the language used in the previous statements needed to align with current global occurrences, and it was agreed that the creation of a glossary would ensure that the statements accurately convey their intended meaning worldwide. Lastly, the advisory group members agreed that an assessment tool be developed to enable the application of the statements in the respective educational contexts.

Applications of the statements

- To organise and develop potential schools, colleges, programmes or faculties (institutions) of pharmacy and pharmaceutical sciences.
- To advocate for the advancement of the profession and pharmaceutical workforce development in your local, national, regional, and global settings.
- To recognise current global aspirations for pharmacy and pharmaceutical sciences education.
- To guide the delivery of regional or local needs-based assessments.
- To self-assess current capacity in pharmacy and pharmaceutical sciences education.
- To monitor progress and capacity in pharmacy and pharmaceutical sciences education.

Target audience

- Schools of pharmacy and colleges, programmes, or faculties (institutions) of pharmacy and pharmaceutical sciences personnel, including administrators, directors, coordinators, educators, and students;
- Providers of Continuing Professional Development (CPD) and Continuing Education (CE);
- Professional and community-based organisations;
- Regulators and other stakeholders;
- Ministers of health, policymakers;
- Accreditors and accrediting bodies;
- Administrators in higher education (Provost, Chancellor, President, Vice Chancellors, Dean etc); and,
- Ministers of education, health, science, and government representatives.

Following the revision, the original eight clusters have been revised into eight domains as follows:

1. Shared global vision
2. Students' admission process
3. Foundation education
4. Professional competencies
5. Experiential education
6. Resources and academic staff
7. Quality assurance and assessment
8. Research

Domain 1: Shared global vision	
Description	Pharmaceutical workforce development efforts should be supported by the FIP Global vision for education and workforce in the context of education and training. This vision empowers professional leaders, educators, regional stakeholders, governmental education and health ministries, and regulators in developing national or regional visions that align with their specific needs, priorities, and resources, to enable pharmacists and pharmaceutical scientists to perform at the highest standards in order to advance the pharmacy profession and improve individual and community health outcomes. *Please see Appendix B for a list of potential areas to focus on.*
1.1	Workforce strategic planning at local, regional, national and global levels should include the roles of all relevant personnel, sufficient to meet the needs of the healthcare system and society in general and to cover emergencies.
1.2	Institutions should commit to delivering quality assured education and training supported by a needs-based approach, and evaluated and assessed to meet accreditation or regulatory standards. See Domain 7 (Quality assurance).
1.3	Institution leaders should model and support advocacy and collaboration with healthcare organisations, students, patient groups, health professions, private and governmental organisations, and like-minded institutions to advance the profession.
1.4	Each institution and its leaders should be intentional about fostering a culture of wellness and workload balance for students, staff and faculty so that they can thrive.
1.5	Approaches to administration, teaching, research and patient care should encompass the principles of Equity, Diversity and Inclusion (EDI/DEI).
1.6	Institutions should ensure that students, faculty, and staff develop competencies in professional values, ethics, knowledge, attitudes, and behaviours to underpin a strong professional identity.
1.7	Institutions should ensure that current pharmacy profession and population health needs, as well as emerging and future trends, are considered and evaluated when developing and updating curricula.
1.8	Institutions should emphasise that pharmacists are patient advocates and care providers who deliver and facilitate efficient access to quality medicines to improve health outcomes. Pharmacists aim to help patients make safe and appropriate use of their medicines while optimising patient-centred care.
1.9	Institutions should emphasise that pharmacists and pharmaceutical scientists support the advancement of health outcomes by conducting research and applying evidence.

1.10	All pharmacists, pharmaceutical scientists, and academic staff should be encouraged to participate in scholarly activities, in all areas of the profession to generate and disseminate new knowledge in their areas of expertise.
1.11	Pharmacists should be champions for good health and wellness promotion, preventive medicine, public health, and holistic patient management. Pharmacists must undertake this health approach from economic, social, cultural, equitable, and ethical perspectives.
1.12	Pharmacy and pharmaceutical science leaders should be proactive in advocating for the advancement of the professional workforce capacity to ensure the changing local, national, regional, and global[1] needs are met.

Domain 2: Students' admission process	
Description	Recruiting students who have a profile that fits the requirements of the school and is aligned with the profile of pharmacists and/or pharmaceutical scientists desired for the country. Educational institutions should prioritise producing a graduate body that represents the population they will serve. *Please see Appendix B for a list of potential areas to focus on.*
2.1	Students entering a pharmacy and pharmaceutical sciences programme should have a strong scientific background, evidence of good academic performance, and demonstrate good social and interpersonal skills.
2.2	Admissions practices should consider the value of a diverse student body reflecting regional population characteristics. They should also consider the market specificities and particular needs.
2.3	As stated in the FIP toolkit for addressing inequities in pharmaceutical education, programmes should embrace a culture that promotes diversity and inclusivity to attract a diverse student body.
2.4	Pharmacy programmes should include multiple strategies to ensure and extend student enrolment, as mentioned in the FIP handbook on strategies to improve enrolment in schools of pharmacy.

Domain 3: Foundation education	
Description	Foundational education includes the initial stage and process of education for learners with a priority on the fundamental knowledge and skills necessary for obtaining a degree and pursuing a career in pharmacy and pharmaceutical sciences. *Please see Appendix B for a list of potential areas to focus on.*
3.1	Pharmacists and pharmaceutical scientists should share a common scientific foundation; however, the educational approach and learning objectives may differ to meet their respective roles and responsibilities.
3.2	The curriculum should focus on biological, social, and pharmaceutical sciences, medicines optimisation, public health, digital health technologies including artificial intelligence, informatics, social determinants of health, patient safety, and healthcare needs in various practice areas that support producing a competent pharmaceutical workforce.

[1] FIP global frameworks and guidance documents on education and workforce development may be adopted and adapted by our members in the absence of local, national or regional guidance or tools.

Domain 3: Foundation education	
3.3	Pharmacists and pharmaceutical scientists should develop essential skills, including interpersonal communication, inter-professional collaboration, self-awareness, professionalism, social accountability, ethical principles, leadership and management, strategic and critical thinking, advocacy, resilience, and adaptability, in order to thrive in their professional careers.
3.4	Assessment of direct patient care competency should be conducted at relevant stages throughout the education process, ensuring students can effectively apply their knowledge in practical settings.
3.5	Assessment of students' learning should incorporate and foster the importance of independent and self-directed lifelong learning, which is crucial for their ongoing professional development post-graduation.
3.6	Experiential learning in diverse settings should be initiated in the early stages of the curriculum.
3.7	Following foundation education, applied life sciences education and specialised education in pharmacy and pharmaceutical sciences should equip learners with in-depth knowledge and skills in specific areas of professional practice and research.
3.8	Institutions are encouraged to explore the FIP Global Competency Framework for support.
3.9	Assessment of the students' learning and practical application should include the laws and standards governing research and practice.

Domain 4: Professional competencies	
Description	Pharmacists, pharmaceutical scientists, and educators need to acquire knowledge, skills, attitudes, and behaviours that make them competent to meet the public's healthcare needs and contribute to scientific development, while interacting and collaborating with other healthcare professionals and stakeholders. For the purposes of this document, competencies include knowledge, skills and behaviours. *Please see Appendix B for a list of potential areas to focus on.*
4.1	The development of diverse and well-rounded professional competencies through education (knowledge, skills, attitudes and behaviours) in pharmacy and pharmaceutical sciences should include, but is not limited to, the following attributes: 1. professional communication 2. empathy 3. problem-solving 4. teamwork 5. leadership 6. attention to detail 7. critical thinking 8. management and organisational skills 9. ethical conduct 10. life-long learning 11. interprofessional collaboration 12. patient education 13. advocacy 14. cultural sensitivity 15. self-awareness 16. creative thinking 17. digital transformation and innovation 18. entrepreneurship

Domain 4: Professional competencies	
	19. strategic thinking 20. professionalism.
4.2	The appropriate balance of science and practice should be established and taught, based on local and regional needs, in addition to international standards and norms.
4.3	Curriculum content should be designed to take into consideration programme outcomes and could include a mix of topics or subjects as indicated in Appendix B.
4.4	Professional skills should build upon the foundations indicated in Domain 3.
4.5	Curriculum focused on patient-centred care activities should be integrated, sequenced, and scaffolded as much as possible.
4.6	Students should be taught both foundational and pharmaceutical sciences in the context of medication use with direct application to patient care. Please see Domain 3 and Appendix B for topics and subject areas to consider.
4.7	Ethical principles, ethical decision-making and professional conduct should be explicitly embedded in education and training as a core competency in scientific and clinical practice.
4.8	All levels of education and training for the pharmaceutical workforce should include opportunities for interprofessional education and collaboration.
4.9	Students should develop the ability to apply the scientific knowledge learned in any field within the profession. Appropriate and deliberate experiential training should be designed for that effect, as stated in Domain 5.
4.10	Clinical sciences courses should endeavour to provide simulations, demonstrations, clinical labs, or real-life experiences to enhance the application of clinical skills and patient-centred care throughout the curriculum.
4.11	Pharmaceutical science courses should include a laboratory experience component to enhance students' scientific skills.
4.12	Pharmacists and pharmaceutical scientists should learn to practice collaboratively, ethically and responsibly with other healthcare professionals and scientists in all fields.
4.13	Self-awareness is an essential key skill for CPD and should begin at the start of their education.
4.14	Academic institutions and professional organisations should support Continuing Professional Development, specialisation, or further education and formal qualifications for graduated professionals in order to prepare them for advanced practice roles.
4.15	Continuing Professional Development should be linked to competencies, career goals, and advanced practice frameworks as appropriate.
4.16	Continuing Professional Development programmes should be contextualised to regional needs and workforce expectations.
4.17	All levels of education and training for the pharmaceutical workforce should include the review and reference of the regulatory requirements for practice.

Domain 5: Experiential education	
Description	Experiential education programmes are where students develop their pharmacy practice and science competencies in a wide variety of real-life settings. The use of reliable tools, such as Entrustable Professional Activities (EPAs), is essential to assess the achievement of desired competencies and outcomes. *Please see Appendix B for a list of potential areas to focus on.*

5.1	Pharmacy students should participate in direct patient care experiences in hospital and community practice settings and in other practice experiences defined by local needs for pharmacists.
5.2	Students should have the opportunity to reflect on the clinical learning experience through case presentations, and development and discussions of clinical notes or pharmaceutical care plans.
5.3	Experiential education should foster the development of critical thinking, collaboration, teamwork, and problem-solving skills related to drug discovery, and medicines regulation and use at individual, community and global levels.
5.4	Students should have the opportunity to learn to apply the clinical and pharmaceutical knowledge that is taught in the classroom in practical settings by working under the supervision of a faculty member, preceptor, tutor, other healthcare professional, or scientist.
5.5	Students should have the opportunity to participate in internships, rotations or clerkships with appropriate mentoring, guidance and reflective learning, based on mutually determined learning objectives.
5.6	Students should have opportunities to learn in a wide array of practice environments, including caring for a diverse group of patients in various cultural and health state environments.
5.7	Additional settings (e.g., pharmaceutical policy, administration, quality assurance, regulatory, technology, distribution, industrial, non-governmental organisations, and teaching and research institutes) should be considered as appropriate environments for experiential education internships or rotations.
5.8	The culture of risk assessment, risk management and patient safety should be communicated clearly as an objective for a pharmacist when practicing in different settings.
5.9	Students should demonstrate the ability and the attitude to adhere to professional ethics, confidentiality, data protection, storage, data sharing, data sovereignty, and privacy policies governing research and practice.
5.10	Preceptors, students, consumers, and health professionals should be provided with opportunities to contribute to curricular decision-making, assessment, and strategic activities.
5.11	Students should have the opportunity to train in a research setting. This is particularly true for those specialising in pharmaceutical sciences. Through research, they will learn skills such as innovating, planning, and scientific reasoning.
5.12	Students should have the opportunity and confidence to promote advancing practice in training sites.

Domain 6: Resources and academic staff	
Description	Resources and academic staff refer to physical and technological infrastructure, specialised equipment, and financial and human resources that are needed to properly prepare pharmacists and pharmaceutical scientists. *Please see Appendix B for a list of potential areas to focus on.*
6.1	Institutions should allocate appropriate resources to showcase workforce or career opportunities and disciplines available to both pharmacists and pharmaceutical scientists.
6.2	Adequate financial resources should be secured to ensure the attainment of the programme objectives. Sources of financial resources could include public or private funding, tuition and fees from students, grants, contributions, and other sources and stakeholders.
6.3	The physical and technological infrastructure and equipment needed for practice and science laboratory work should be up to date, in good condition, and in sufficient quantity to allow learners to benefit from practical learning.
6.4	Required educational resources and supporting technologies, such as textbooks, software and platforms, should be available to students in their respective programmes.

Domain 6: Resources and academic staff	
6.5	A safe and inclusive working and learning environment should be provided for faculty, staff, administrators and learners to foster health and well-being.
6.6	Academic staff should have academic or professional qualifications or experience and expertise that supports their primary areas of teaching, research, practice, service and administration.
6.7	Academic staff should be supported to share their knowledge and promote collaboration with colleagues in their field and across other fields at local, regional, national and international levels as appropriate.
6.8	The teaching, research, service and administrative performance of academic staff should be taken into consideration for their academic advancement.
6.9	Academic staff should regularly update their teaching materials and methods to ensure relevance to contemporary aspects of teaching, practice, science and community health needs while supporting future developments.
6.10	Contemporary best practices such as active learning and other innovative education techniques should be incorporated in any learning setting.
6.11	All academic staff should engage in continuing professional development and self-directed lifelong learning activities that are relevant to their work and responsibilities.
6.12	Academic staff at pharmacy programmes should collaborate with pharmaceutical scientists, preceptors and experiential learning sites to ensure quality learning and achieve programme outcomes.
6.13	All academic staff, practitioners, preceptors and students should be involved in assessing the curriculum.
6.14	All academic staff should adopt evidence-based recommendations in curricular decision-making.
6.15	The academic programme should support the academic staff, preceptors, students and administrators to engage in professional activities with other health sectors so as to promote interprofessional education, science and practice.
6.16	The institution should support and provide funding for professional development and lifelong learning activities of the academic staff.

Domain 7: Quality assurance and assessment	
Description	Quality assurance and assessment refers to the key aspects and mechanisms to identify opportunities for and make improvements to pharmacy and pharmaceutical sciences education in order to ensure a good sustainable performance and suitable competencies of the future workforce. *Please see Appendix B for list of potential areas to focus on.*
7.1	A quality improvement programme should be in place at the institution, with scheduled periodic internal programme reviews and examples of specific improvement demonstrated periodically.
7.2	Metrics should exist to measure, monitor, manage and improve the quality of the education and training provided.
7.3	Quality metrics should include feedback from current students and recent graduates, faculty, staff, preceptors, and key external stakeholders, such as employers, regulators and professional bodies.
7.4	Assessment and evaluation results are considered during strategic and quality improvement planning and implementation.

Domain 7: Quality assurance and assessment	
7.5	Policies and procedures should support regular review of the curriculum and allow developments in the curriculum to take place in a timely manner to keep up with the changes in the profession, health care sector, technology, industry, and society.
7.6	The pharmacy and pharmaceutical sciences degree programmes should be offered at an undergraduate, professional or graduate level, and all the experiential components (placements) in clinical, industrial, research and institutional settings are undertaken under the supervision of the programme.
7.7	Competencies should be assessed throughout the curriculum, not just at the end of it.
7.8	Competencies for undergraduate students should align with the national core competencies framework or needs, while that of professional or graduate students should be compatible with national advanced competency frameworks or needs.
7.9	Regional or global competency frameworks could be used as a supplement for national competencies, or in the absence of a national framework.
7.10	A formal system of quality assurance, administered by a government or an independent agency approved by the government, should be in place and required for all institutions.
7.11	The accreditation system should use validated standards that have been developed and adopted with broad stakeholder involvement. It should align where possible with international education recommendations, while taking into consideration contextual aspects.
7.12	Education policies and procedures should include qualified and experienced peer evaluation, confidentiality, and fair and consistent application of accreditation standards as required.
7.13	The peer evaluation process should be without conflict of interest.
7.14	Quality improvement should always include a transparent process for handling educators, staff and students' concerns, issues and complaints.
7.15	Students should be informed of the progress and outcome of any raised concern.

Domain 8: Research	
Description	This includes the integration of research into pharmacy and pharmaceutical science education, promoting a culture of research, ethical research, enquiry, critical thinking, problem-solving and collaboration that prepares students and educators to become future leaders and innovators in the field. Areas of research could include the scholarship of teaching and learning, basic sciences, translational research, implementation science, direct patient care, health outcomes, public health, data and information science, social science, and other emerging fields. *Please see Appendix B for a list of potential areas to focus on.*
8.1	Institutions should foster a visionary and forward-thinking approach to pharmacy and pharmaceutical science education and training that places a strong emphasis on research integration and integrity, thereby cultivating a research-driven mindset among educators, practitioner and students.
8.2	Research efforts should include evidence-based teaching and learning, and research-enhanced education.
8.3	Research settings should allow for the gathering of evidence-based data. Such spaces include, but are not limited to, campus labs and industrial type labs, using basic sciences tools, pharmaceutical technology, and large data set analysis.
8.4	Institutions should encourage educators, practitioners, and students to value research, critically evaluate research findings and contribute to the development of evidence-based practices and innovations, the evolving environment and future of healthcare, and scientific discovery.

Domain 8: Research	
8.5	Institutions should support research activities of students and educators by promoting internal and external funds and resources as appropriate.
8.6	Researchers and educators should be mindful of the emerging areas in education, public health, equity, pharmacy and pharmaceutical sciences as well as other areas that may intersect with these fields.
8.7	Institutions should create human capacity building programmes to foster an environment ensuring the training of research preceptors, supervisors and mentors.
8.8	Institutions should ensure that students understand research concepts, methodologies and principles that underscore improving patient outcomes and advancing scientific knowledge. Mentoring by research-driven educators is a key process to reach this outcome.
8.9	Institutions should facilitate collaboration between academia, industry, governmental, non-governmental, practice, health care, and research institutions to drive advancements, incorporating this outcome into pharmaceutical education and training of students.
8.10	Institutions should encourage the dissemination of research findings of their educators, administrators, staff and students through publications, patents, research workshops, seminars, symposia, abstracts, poster sessions, and other research activities and forums.

Appendix A

African region

1. International Pharmaceutical Federation (FIP). FIP pharmacy education in sub Saharan Africa. The Hague: International Pharmaceutical Federation; 2020
2. The South African Pharmacy Council, Guidelines for Work-based Learning (WBL), 2023

Americas

1. Lea S Eiland, Tim R Brown, Cher Y Enderby, Georgia G Luchen, Winter J Smith, James A Trovato, Marie A Chisholm-Burns, The ASHP Section of Pharmacy Educators Crystal Ball project: Insight into the future of pharmacy education, American Journal of Health-System Pharmacy, Volume 80, Issue 4, 15 February 2023, Pages 236–241, https://doi.org/10.1093/ajhp/zxac332
2. Allen DD, Lin AYF, Haines ST, Sorensen TD, Melchert RB, Blouin RA, Austin Z, Moore GD, Poloyac SM, Vermeulen LC. AACP Argus Commission Forecast 2024. Am J Pharm Ed. 2024. In Press.

Eastern Mediterranean region

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Western Pacific region

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2. Kawaguchi-Suzuki, M., Hogue, M. D., Khanfar, N. M., Lahoz, M. R., Law, M. G., Parekh, J., Zairina, E., Hong, J., Robles, Y. R., & Van Thang, V. (2019). Cultural Sensitivity and Global Pharmacy Engagement in Asia: India, Indonesia, Malaysia, Philippines, and Vietnam. American journal of pharmaceutical education, 83(4), 7215. https://doi.org/10.5688/ajpe7215
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4. The Society of Hospital Pharmacists of Australia, Pharmacy Forecast Australia, 2023, https://adpha.au/publicassets/dbcc375f-7a7f-ee11-912f-00505696223b/Pharmacy-Forecast-Australia-2023-Executive-Summary.pdf

European region

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South East Asia region

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Appendix B

Terms, topics and subject areas for consideration.

1. Advancing and sustaining the profession
2. Advocating for the profession
3. Application of change management in pharmacy
4. Appropriate medication use and optimisation of therapy
5. Artificial Intelligence (AI) in pharmacy
6. Artificial intelligence (AI) in pharmaceutical education
7. Behavioural, and administrative sciences
8. Bioethical principles and values
9. Biomedical sciences as foundational knowledge
10. Biomedical sciences in curriculum distribution
11. Broad applicability of academic experiences in the profession
12. Clinical pharmacy
13. Clinical sciences in foundational knowledge
14. Collaborative work with other healthcare professionals
15. Continuing Professional Development (CPD) in regulated practices
16. Contextual teaching of pharmacotherapy
17. CPD in unregulated practices like academia
18. Cross-disciplinary learning in pharmaceutical education
19. Design of deliberate experiential training
20. Development of ability to apply scientific knowledge
21. Digital health in pharmaceutical contexts
22. Digital health methods
23. Digital technology in the curriculum
24. Drug delivery modalities
25. Education and training in research skills
26. Engaging with scientists in medical and scientific fields
27. Entrepreneurship in pharmacy
28. Environmental sustainability
29. Ethical decision making
30. Ethical practice
31. Evolution of the pharmacist and pharmaceutical scientist roles through CPD
32. Experiential training
33. Forecasting in pharmacy
34. Hands-on laboratory training
35. Health informatics
36. Interdisciplinary collaboration in social fields
37. Interprofessional education
38. Knowledge development for assessing scientific evidence
39. Laboratory experiences in pharmaceutical science courses
40. Lifelong learning as a core value in the pharmaceutical profession
41. Licit and illicit substance abuse
42. Medical devices, wearables, and sensory devices
43. Medication considerations for special populations, including:
    - Critically ill patients
    - Immunocompromised patients
    - Older persons
    - Paediatric patients
    - Pregnant patients and lactating mothers
44. Medication safety

45. Nutrition in pharmaceutical education
46. Pathophysiology in patient context
47. Patient centred care
48. Pharmaceutical chemistry and pharmaceutical analysis
49. Pharmaceutical regulatory sciences
50. Pharmaceutical sciences in foundational learning
51. Pharmaceutical technology
52. Pharmaceutics
53. Pharmacoeconomics and its importance
54. Pharmacogenomics in modern pharmacy practice
55. Pharmacokinetics and biopharmaceutics
56. Pharmacognosy
57. Pharmacology
58. Pharmacoepidemiology
59. Pharmacy administration, including:
    a. people management,
    b. budgeting,
    c. forecasting,
    d. purchasing,
    e. advocacy,
    f. inventory management among others
    g. Planning and evaluation
60. Pharmacy law or legislative review of the practice of pharmacy
61. Pharmacy practice standards
62. Pharmacy and pharmacist's role in emergency preparedness
63. Population health
64. Preparing for future disasters in the pharmaceutical context
65. Professional and ethical pharmaceutical practice
66. Public health
67. Quality assurance and quality control
68. Real-life experiences in clinical training
69. Research ethics and the ethics of research for theory and practice
70. Research methods and applied statistics
71. Research through proper training
72. Role of scientific evidence in pharmaceutical and product development
73. Role of scientific evidence in population health
74. Simulations in clinical sciences courses
75. Skills and abilities for critical scientific assessment
76. Sports pharmacy and its relevance
77. Systems-based care assessment
78. Team-working competencies
79. Use of virtual reality and augmented reality in didactic and experiential learning

Appendix C

The categories and the terms within them:

Advocacy:
1. Advancing and sustaining the profession
2. Advocating for the profession
3. Advocating for the patient and for 'society' in matters related to pharmacy

Application and Integration of knowledge:
1. Application of change management in pharmacy
2. Broad applicability of academic experiences in the profession
3. Development of ability to apply scientific knowledge
4. Knowledge development for assessing scientific evidence

Clinical and experiential learning:
1. Appropriate medication use and optimisation of therapy
2. Clinical pharmacy
3. Clinical sciences in foundational knowledge
4. Contextual teaching of pharmacotherapy
5. Experiential training
6. Hands-on laboratory training
7. Laboratory experiences in pharmaceutical science courses
8. Real-life experiences in clinical training
9. Simulations in clinical sciences courses

Continuing Professional Development (CPD):
1. CPD in unregulated practices like academia
2. CPD in regulated practices
3. Evolution of the pharmacist and pharmaceutical scientist roles through CPD
4. Lifelong learning as a core value in the pharmaceutical profession

Digital literacy:
1. Artificial Intelligence (AI) in pharmacy
2. Artificial intelligence (AI) in pharmaceutical education
3. Digital health in pharmaceutical contexts
4. Digital health methods
5. Digital technology in the curriculum
6. Use of virtual reality and augmented reality in didactic and experiential learning
7. Principles of semantic interoperability
8. Data and information competency and management
9. Emerging technologies

Interprofessional collaboration:
1. Collaborative work with other healthcare professionals
2. Interprofessional education for the pharmaceutical workforce
3. Interprofessional learning activities for pharmacists
4. Interdisciplinary collaboration in social fields
5. Cross-disciplinary learning in pharmaceutical education

Leadership and self-regulation:
1. Engaging with scientists in medical and scientific fields
2. Entrepreneurship in pharmacy

3. Forecasting in pharmacy
4. Leading change
5. Change management principles
6. Visioning and strategic thinking

Legal and regulatory practice:
1. Licit and illicit substance abuse
2. Pharmaceutical regulatory sciences

Professional and ethical practice:
1. Professional and ethical pharmaceutical practice
2. Pharmacy administration, including people management, budgeting, purchasing, inventory management
3. Growth mindset and reflective practice

Public health:
1. Population health
2. Public health
3. Pharmacy and the pharmacist's role in emergency preparedness and response

Pharmaceutical sciences:
1. Biomedical sciences as foundational knowledge
2. Biomedical sciences in curriculum distribution
3. Critically ill patients
4. Drug delivery modalities
5. Immunocompromised patients
6. Medication considerations for special populations, including:
7. Medication safety
8. Nutrition in pharmaceutical education
9. Older persons
10. Pathophysiology in patient context
11. Pharmaceutical chemistry and pharmaceutical analysis
12. Pharmaceutical sciences in foundational learning
13. Pharmaceutical technology
14. Pharmaceutics
15. Pharmacoeconomics and its importance
16. Pharmacogenomics
17. Pharmacogenomics in modern pharmacy practice
18. Pharmacokinetics and biopharmaceutics
19. Pharmacognosy
20. Pharmacology
21. Pharmacoepidemiology
22. Paediatric patients
23. Pregnant patients and lactating mothers
24. Sports pharmacy and its relevance
25. Systems-based care assessment

Quality assurance and research in the workplace:
1. Design of deliberate experiential training
2. Quality assurance and quality control
3. Research methods and applied statistics
4. Research through proper training
5. Role of scientific evidence in pharmaceutical and product development
6. Role of scientific evidence in population health
7. Skills and abilities for critical scientific assessment

Glossary

Term	Definition	Source
Academia (personnel working in academia)	Teaching, research and other roles at higher education institutions.	FIP 2017 Global Trends Shaping Pharmacy questionnaire
Accredited institutions or programmes	Accredited by an external organisation that has the authority to define and use agreed standards to evaluate and accredit the overall quality of the institution or programmes providing education and training.	FIP 2017 Global Trends Shaping Pharmacy questionnaire
Active learning	Instructional techniques that allow learners to actively participate in learning and teaching activities, to take the responsibility for their own learning, and to establish connections between ideas by critical thinking, analysing, synthesising, evaluating, or problem solving.	International Pharmaceutical Federation (FIP). FIP Digital health in pharmacy education. The Hague: International Pharmaceutical Federation; 2021. https://www.fip.org/file/4958
Advanced practitioner	Pharmacists who provide complex services and take on roles which are extended, specialised and more advanced than current entry level scope of practice.	International Pharmaceutical Federation (FIP). Advanced Practice and Specialisation in Pharmacy: Global Report 2015. The Hague: International Pharmaceutical Federation; 2015. https://www.fip.org/file/1397
Actively practicing	A registered/licensed or authorised professional who is currently active in the provision of pharmacy services.	From the questionnaire glossary that was used for the study entitled FIP 2017 Global Trends Shaping Pharmacy
Artificial intelligence	Simulation of human intelligence processes by machines, especially computer systems that work and react like human beings. Specific applications of AI include, but are not limited to, expert systems, natural language processing (NLP), written words, speech and visual recognition, machine learning, machine vision, and knowledge graph generation to provide explainability.	International Pharmaceutical Federation (FIP). FIP Digital health in pharmacy education. The Hague: International Pharmaceutical Federation; 2021. https://www.fip.org/file/4958

Term	Definition	Source
Clinical pharmacist	"Pharmacists who work directly with physicians, other health professionals, and patients to ensure that the medications prescribed for patients contribute to the best possible health outcomes. Clinical pharmacists practice in health care settings where they have frequent and regular interactions with physicians and other health professionals, contributing to better coordination of care".	American College of Clinical Pharmacy. About clinical pharmacists. Accessed 4 September 2023. https://www.accp.com/about/clinicalpharmacists.aspx
Community pharmacy	A health care facility dispensing medicines (such as prescription medicines and non-prescription medicines, reimbursable and non-reimbursable medicines) and other healthcare products, providing pharmaceutical services including patient advice about self-care, pharmacotherapy and optimising drug therapy regimens to out-patients and offering further services.	FIP 2017 Global Trends Shaping Pharmacy questionnaire
Continuing Professional Development (CPD)	"CPD as a self-directed, ongoing, systematic and outcomes-focused approach to lifelong learning that is applied into practice. It involves the process of active participation in formal and informal learning activities that assist individuals in developing and maintaining continuing competence, enhancing their professional practice, and supporting achievement of their career goals."	Accreditation Council for Pharmacy Education. Continuing Professional Development. Accessed 4 September 2023. https://www.acpe-accredit.org/continuing-professional-development
Curriculum design	The process of meaningfully constructing, designing and interconnecting the components of a curriculum so as to address such fundamental questions as what needs to be learned, how and why, what are the learning outcomes and professional competencies, the resources required and how learning will be assessed.	United Nations Educational, Scientific and Cultural Organization Glossary of curriculum terminology - UNESCO Digital Library
Digital health	The field of knowledge and practice associated with the development and use of digital technologies to improve health. Digital health expands the concept of eHealth to include digital consumers, with a wider range of smart-devices and connected equipment. It also encompasses but is not limited to other uses of digital technologies for health such as the Internet of things, artificial intelligence, big data and robotics.	International Pharmaceutical Federation (FIP). FIP Digital health in pharmacy education. The Hague: International Pharmaceutical Federation; 2021. https://www.fip.org/file/4958
Diversity	The practice or quality of including or involving people from a range of different social and ethnic backgrounds and of different genders, sexual orientations, etc.	Oxford University Press (2023) Oxford English Dictionary. https://www.oed.com/. Accessed 5 September 2023.

Term	Definition	Source
Entrepreneurship	Engaging in innovative activities by using creative thinking to envision better ways to accomplish professional goals.	Accreditation Council for Pharmacy Education (2017) Accreditation Standards and Key Elements for the Professional Programme in Pharmacy Leading to the Doctor of Pharmacy Degree ("Standards 2016").
Equity	The absence of unfair, avoidable or remediable differences among groups of people, whether those groups are defined socially, economically, demographically, or geographically or by other dimensions of inequality (e.g., gender, ethnicity, culture, disability, or sexual orientation); fairness and impartiality in providing resources and opportunities to different individuals or groups.	World Health Organization (WHO). Health equity. Accessed 5 September 2023. https://www.who.int/health-topics/health-equity#tab=tab_1
Ethics	Professional ethics is concerned with the professional values, standards and moral conduct that are agreed upon by the profession, to govern the behaviour of the profession and its members.	FIP Ethics advisory committee
Professionalism	The ethics, attitudes, values, qualities, conduct, and behaviours that characterise a profession and are expected of its practitioners, and that underpin the trust that the public has in the profession.	International Pharmaceutical Federation (FIP) Quality Assurance of Pharmacy Education: the FIP Global Framework. 2014; 2nd ed: http://fip.org/files/fip/PharmacyEducation/Quality_Assurance/QA_Framework_2nd_Edition_online_version.pdf
Evidence based practice	"Integrating the best available research evidence with clinical expertise and the patient's unique values and circumstances"	Straus, S. E., Glasziou, P., Richardson, W. S., & Haynes, R. B. (2011). Evidence-based medicine: How to practice and teach it (4th ed.). Edinburgh: Churchill Livingstone Elsevier.
Experiential education	"Experiential education is a teaching philosophy that informs many methodologies in which educators purposefully engage with learners in direct experience and focused reflection in order to increase knowledge, develop skills, clarify values, and develop people's capacity to contribute to their communities."	Association of experiential education. What is experiential education? Accessed 4 September 2023. https://www.aee.org/what-is-experiential-education

Term	Definition	Source
Global	Relating to or involving the entire world.	Collins. Online dictionary. https://www.collinsdictionary.com/dictionary/english/global
Health care provider/ Care provider	Trained and authorised person to provide healthcare services.	No source: This is the Nanjing advisory group clarifying for the context of the document
Hospital pharmacist	A pharmacist who practises in a hospital pharmacy or hospital pharmacy department. Cf. Hospital pharmacy/pharmacy department	FIP 2017 Global Trends Shaping Pharmacy questionnaire
Hospital pharmacy/pharmacy department	Premises which in accordance with the local legal provisions and definitions may operate as a facility in the provision of pharmacy services in the hospital setting.	FIP 2017 Global Trends Shaping Pharmacy questionnaire
Inclusivity	Ensuring equal opportunities and access to education and training for all individuals, regardless of their background or characteristics.	No source: This is the Nanjing advisory group clarifying for the context of the document
Interdisciplinary approach	An approach to integration that generates an understanding of themes and ideas that cut across disciplines and of the connections between different disciplines and their relationship to the real world. It normally emphasises process and meaning rather than product and content by combining contents, theories, methodologies and perspectives from two or more disciplines.	United Nations Educational, Scientific and Cultural Organization Glossary of curriculum terminology - UNESCO Digital Library
Innovation in teaching	Using new, creative, effective and emerging approaches to deliver educational content.	No source: This is the Nanjing advisory group clarifying for the context of the document
Institution	These include but are not limited to academic institutions, programmes, schools, faculties, colleges of Pharmacy and Pharmaceutical Sciences.	No source: This is the Nanjing advisory group clarifying for the context of the document
Integrated	An integrated curriculum implies learning that is synthesised across traditional subject areas and learning experiences that are designed to be mutually reinforcing.	Educare. Different types of curriculum. Accessed 4 September 2023. https://educarepk.com/different-types-of-curriculum.html

Term	Definition	Source
Interdisciplinary learning	Learning that involves multiple disciplines or fields of study.	No source: This is the Nanjing advisory group clarifying for the context of the document
Internship	An internship is a short-term work placement available to students and graduates. Internships tend to be project-led and include an element of graduate development.	No source: This is the Nanjing advisory group clarifying for the context of the document.
Interprofessional collaboration	Collaboration between different healthcare professionals to provide holistic education, training and care.	Glossary project for education and training by FIP PTAC
Interprofessional education	When members of two or more health and/or social care professions (e.g., dentistry, medicine, nursing, pharmacy) engage in learning with, from and about each other to improve collaboration and the delivery of care.	International Pharmaceutical Federation (FIP). Interprofessional Education in a Pharmacy Context: Global Report 2015. The Hague: International Pharmaceutical Federation; 2015 https://www.fip.org/file/1403
Interprofessional collaborative practice	When healthcare workers from different professional backgrounds work together with patients, families, care givers, and communities to deliver the highest quality of care.	International Pharmaceutical Federation (FIP). Interprofessional Education in a Pharmacy Context: Global Report 2015. The Hague: International Pharmaceutical Federation; 2015. https://www.fip.org/file/1403
Leadership	The action of leading a group of people or an organisation. *"Leadership is an action, not a position"*: quote from Donald McGannon. "*Leadership is influence*": quote from John C. Maxwell.	New Oxford Dictionary of English. The concept of leadership. https://www.tlu.ee/~sirvir/IKM/The%20Concept%20of%20Leadership/definitions_of_leadership.html

Term	Definition	Source
Local	A specific geographical location with its own unique combination of social, economic, environmental, cultural, and political dynamics at a particular point in time.	Adapted: Handbook of research on educational leadership and research methodology. Listening to leaders: investigating the role of the school leader in Implementing entrepreneurship education. What is local context? Accessed 23 October 2023 https://www.igi-global.com/dictionary/listening-to-leaders/112405#:~:text=A%20specific%20geographical%20location%20with,a%20particular%20point%20in%20time
Mentor	Experienced and knowledgeable individual who provides guidance, support, and advice to students or professionals in the field of pharmacy and pharmaceutical sciences.	Glossary project for education and training by FIP PTAC
Mentoring	A relationship between a less experienced individual (known as a mentee) and a more experienced individual (known as a mentor) through which the mentor facilitates and supports learning. It can involve a one-on-one relationship or a network of multiple mentors. The network can contain peers, 'step-ahead' peers, or supervisors.	United Nations Educational, Scientific and Cultural Organization Glossary of curriculum terminology - UNESCO Digital Library
National	Of, relating to, or affecting all the people or the whole area of a nation or state.	Adapted: https://www.merriam-webster.com/dictionary/public
Needs-based education	Needs-based education is a model for developing pharmacy education globally where an assessment of the needs of the community is conducted, and supporting educational systems are developd or adapted accordingly. Needs-based education helps to determine requirements and the appropriate amount of information required to develop the education to address those identified needs.	Anderson, C., Bates, I., Brock, T., Brown, A. N., Bruno, A., Futter, B., Rennie, T., & Rouse, M. J. (2012). Needs-based education in the context of globalization. American journal of pharmaceutical education, 76(4), 56. https://doi.org/10.5688/ajpe76456
Patient-centred practice/ care	An approach to healthcare that prioritises the individual patient's needs, preferences, values, and goals.	Glossary project for education and training by FIP PTAC
Pharmaceutical education and training	Preparation of professional pharmacists and pharmaceutical scientists linked to the health needs of populations and national health priorities.	Transforming pharmaceutical education: A needs-based global analysis for policy development.

Term	Definition	Source
		https://www.sciencedirect.com/science/article/pii/S266727662300015X
Pharmaceutical scientist	A pharmaceutical scientist is a professional who performs research to drive drug discovery, development, and testing.	O'Connor, S. What does a pharmaceutical scientist do? 2020. Accessed 23 October 2023. https://graduate.northeastern.edu/resources/what-does-a-pharmaceutical-scientist-do/
Pharmacist	In March 2016 the FIP Board of Pharmaceutical Practice adopted the following definition of a "pharmacist": "A pharmacist is a scientifically trained graduate healthcare professional who is an expert in the supply and use of medicines. Pharmacists assure access to safe, cost-effective and quality medicines and their responsible use by individual patients and healthcare systems."	International Pharmaceutical Federation. Board of Pharmaceutical Practice https://www.fip.org/pharmaceutical-practice-and-the-fip-sections
Pharmacy graduate	A person who has completed studies in pharmacy at university level (granted by adequate diploma), regardless of whether they have already been registered/licensed or not.	FIP 2017 Global Trends Shaping Pharmacy questionnaire
Pharmacy services	A service delivered in the pharmaceutical institution, including but not limited to medication management, medicine use optimisation, medication-related procurement, delivery, and management, and health-related counselling and promotion.	No source: This is the Nanjing advisory group clarifying for the context of the document.
Pharmacy support workforce	A healthcare provider who performs pharmacy related functions in community, hospital, institutional and industrial settings, and who is engaged in other activities under the supervision of the pharmacist. In most countries, pharmacy technicians have met the necessary educational requirements and hold a professional registration.	https://doi.org/10.1016/j.sapharm.2021.10.002. Accessed April 3, 2024.
Pharmaceutical workforce	Pharmaceutical workforce refers to the whole of the pharmacy-related workforce (e.g., registered pharmacist practitioners, pharmaceutical scientists, pharmacy technicians and other pharmacy support workforce cadres, pre-service students/trainees) working in a diversity of settings (e.g., community, hospital, research and development, industry, military,	International Pharmaceutical Federation (FIP). Pharmacy Workforce Intelligence: Global Trends Report. The Hague. International Pharmaceutical Federation; 2018. https://www.fip.org/file/2077. Accessed July 11, 2022.

Term	Definition	Source
	regulatory, academia and other sectors) with a diversity of scope of practice.	
Postgraduate programme	An academic programme after completing an undergraduate degree. Postgraduate courses include graduate diploma, residency programmes, fellowships, Master's degree and PhD.	What is a postgraduate degree? A definition and guide. https://www.postgrad.com/advice/postgraduate-studies/what-is-a-postgraduate-degree/#:~:text=A%20postgraduate%20degree%20is%20a,Diplomas%20and%20Certificates%2C%20and%20PhDs.
Preceptors	Experienced practitioners who provide education, guidance and supervision to students during their experiential education.	What is a preceptor? Dalhousie University. https://www.dal.ca/faculty/health/practice-education/for-students/what-is-a-preceptor-.html
Professional identity	Internalising a profession's core knowledge, skills, values and beliefs, resulting in an individual "thinking, acting and feeling" like a member of that professional community.	American Association of Colleges of Pharmacy. Professional identity formation. Accessed 5 September 2023. https://www.aacp.org/article/professional-identity-formation
Professional organisations	Organisations that represent and advocate for the interests of pharmacy and pharmaceutical science professionals at a national or global level.	Professional association. Online dictionary. https://www.concurrences.com/en/dictionary/association-of-undertakings
Professional pharmacy education	The process of acquiring knowledge, skills, and attitudes required for pharmacy practice.	No source: This is the Nanjing advisory group clarifying for the context of the document.
Quality assurance in education	The process of ensuring and improving the quality of pharmacy and pharmaceutical science education and training. FIP's Global Framework for Quality Assurance of Pharmacy Education proposes quality assurance is a comprehensive system incorporating many elements: five pillars (context, structure, process, outcomes and impact) and three foundations (science, practice and ethics) to quality in pharmacy education.	International Pharmaceutical Federation. Quality Assurance of Pharmacy Education: the FIP Global Framework 2014. The Hague: International Pharmaceutical Federation; 2014. https://www.fip.org/files/fip/PharmacyEducation/Quality_Assurance/QA_Framework_2nd_Edition_online_version.pdf

Term	Definition	Source
Regional	For the context of these statements, regions are referred to as WHO regions. The Member States of the World Health Organization (WHO) are grouped into six regions. These regions are organisational groupings and, while they are based on geographical terms, are not synonymous with geographical areas. Note that the WHO regions are not the same as those of the United Nations.	World Health Organization (WHO). Country groupings. Accessed 5 September. https://www.who.int/about/structure
Regulators	Authorities responsible for overseeing and enforcing regulations related to pharmaceutical education, practice, sciences and products.	No source: This is the Nanjing advisory group clarifying for the context of the document.
Research culture	Research culture encompasses the behaviours, values, expectations, attitudes and norms for research which has influences on researchers' career paths and determines the way that research is conducted and communicated.	The Royal Society. Research culture. Accessed 5 September 2023. https://royalsociety.org/news-resources/projects/research-culture
Research forums	Diverse avenues of disseminating research, such as peer-reviewed journals, congresses, and workshops.	Thielen, Joanna & Spunaugle, Emily & Swanberg, Stephanie. (2020). Research Forum: Creating and Sustaining an Intra-library Venue to Share Library Faculty Research. Journal of Librarianship and Scholarly Communication. 8. 2332. https://doi.org/10.7710/2162-3309.2332
Research integration	Incorporating research principles and methodologies into pharmacy and pharmaceutical science education.	No source: This is the Nanjing advisory group clarifying for the context of the document
Service	Supporting through effort the institution community and/or broader society.	No source: This is the Nanjing advisory group clarifying for the context of the document
Supervisor	Individual who provides guidance, support, and oversight to students during their practical training or experiential education.	No source: This is the Nanjing advisory group clarifying for the context of the document
Tutoring	Any activity offering a learner guidance, counselling, or supervision by an experienced and competent professional. The tutor supports the learner throughout the learning process (at school, in training centres or on the job). Tutoring can cover academic subjects such as improving educational achievement, career advice to ease transition from school to work, and personal development advice to encourage learners to make wise choices. Learners includes students, fellows and post-graduate trainees.	Glossary project for education and training by FIP PTAC

Term	Definition	Source
Workforce development	Ensuring that a capable, effective and sustainable pharmaceutical workforce is equipped to face new challenges and uncertainty with a focus on the individual to grow their knowledge and skills to meet the needs of healthcare systems and society.	No source: This is the Nanjing advisory group clarifying for the context of the document

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