

Pharmaceutical Business and Pharmaceutical Industry: New Tracks in Pharmacy Education Initiated in Jordan

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ABSTRACT

Design and develop a market driven pharmacy study plan with new tracks.

Identifying locally determined needs and services and using those to facilitate comprehensive education development toward achieving competencies. Comparative analysis for current study plans of several pharmacy schools combined with a multi-stakeholder in the pharmaceutical industry interviewing approach for an assessment of the needs of the community regarding pharmacy profession.

Needs-based education, ongoing consultation and co-operation between related stakeholders including higher education policy makers. Development of Pharmaceutical business and Pharmaceutical industry new tracks as an initiative in Jordan followed by implementation of this outcomes-based education strategy.

Providing market driven study plan to serve the local, regional and international community by skilful professional pharmacy graduates will satisfy pharmaceutical industry needs. Persistence toward successful implementation of this initiative in Jordan will encourage other areas of the world to follow as per their local market needs.

Keywords: Pharmacy curriculum, New initiative, Business, Industry.

1. INTRODUCTION

The Hashemite Kingdom of Jordan is a small lower-middle income developing country with limited natural resources. The Gross Domestic Product (GDP) is \$29 billion and per capita of GDP is \$4627 (2011)⁽¹⁾. With an adult (>15 yrs) literacy rate of 93%, Jordan had a total unemployment rate of 12.2% in 2012⁽²⁾. Jordan is one of the fastest growing and most modern countries in the Middle East, small in size covering an area of 89,318 square kilometres, with a population of 6.25 million in 2012. Population growth rate for the same year was 2.2%, with 37.3% of the population under 15 years of age, and

only 3.2% over the age of sixty-five. The average household includes 5.4 persons⁽³⁾. On the financial side, Jordan has a small economy with scarce water resources and imported almost all energy it consumes.

There are three main regions: north, central, and south. Each region contains four administrative Governorates. However, of the total population, the majority (82.6%) are categorized as urban, with 2.473 million (38.7%) residing in the governorate of Amman⁽⁴⁾.

Jordan is recognized to understand the role of education in forming humans; this was reflected in its commitment to make basic education accessible to all. Stages of Education in Jordan consist of school education and university education (higher education).

Education in Jordan

School education in Jordan has grown dramatically

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since its beginnings in the 1920s. At present there are more than 3000 governmental schools and more than 1500 privately owned schools covering all areas of Jordan even remotest corners of the country⁽⁴⁾. Jordan gives great importance to basic and secondary education as well as higher learning. Ministry of Higher Education (MOHE) was established in 1985 to create culture of excellence, innovation and scientific research and regulate the relationship with institutions of higher education by supervising the sector of higher education in Jordan through the Higher Education Council which assumes the responsibility of establishing the general policy for the higher education sector, the Scientific Research Support Fund and the Higher Education Accreditation Commission (HEAC)^(4, 5).

Universities' admission is based upon high school academic performance (called Tawjihi) and no pre pharmacy university credit-hour requirements exist⁽⁶⁾. Female students dominate admissions in Jordan.

International research indicates that almost one third of pharmacy students do not receive any profession related advice before commencing their university studies, which may suggest that many students choose to study pharmacy only because it's a medical related profession⁽⁷⁾ while in Jordan it is usually an output of student's Tawjihi score. Students career choices after graduation were hospital pharmacy and community pharmacy practice. Income, benefits, and geographical location ranked as the most significant extrinsic factors influencing selection of a career goal by these students⁽⁸⁾.

Historically, pharmacy held the domains of sourcing raw ingredients, formulation, supply and distribution of pharmaceuticals. Industrialization involving large-scale manufacturing of medicinal products, resulted in pharmacy losing compounding aspects of its role with the pharmaceutical industry⁽⁹⁾ and moved to more dispensing and counseling role.

In 1979-1980 only two pharmacy schools (public) existed in Jordan (The University of Jordan; UJ and Yarmouk University; YU; affiliated in 1986 to Jordan University of Science and Technology; JUST which was established for Health Life Sciences, Engineering and Science schools), while today 14 (5 public plus 9 private) schools of pharmacy are present in Jordan. As required by the Jordanian HEAC, basic minimum requirements for pharmacy education in Jordan must be more than 160 credit hours over the 5 years study; consists of the following basic knowledge areas: Chemistry (pharmaceutical and medicinal), Pharmaceutics (pharmaceutical and medicinal), Medical sciences, Advanced Pharmaceutics, what is been called supportive domains (preparatory year) and not less than 15% experiential education courses. In addition some elective courses of at least 9 credit hours in any knowledge area offered by the school, all courses are delivered in English⁽¹⁰⁾ (Table 1). During study (generally after finishing 3rd year) and after graduation, a minimum of 1440 hours of community pharmacy training is required by the Jordanian Pharmaceutical Association (JPA) membership and consequently eligible graduates apply for pharmacy profession practicing certificate by the Ministry of Health⁽¹¹⁾.

The growth of clinical pharmacy worldwide and the shift of pharmacy from product centered into patient-centered profession particularly in the west (USA and Europe) have affected pharmacy education in low- and middle-income countries⁽¹²⁾. Jordan is not an exception; pharmacy education and practice continues to evolve following the west; Doctor of Pharmacy (PharmD) programs started in Jordan in 2000 and 2005 in JUST and UJ respectively without much change in the curriculum of bachelor of pharmacy and with extra courses to reach a total credit of 216 hours education including 1000 hours of community pharmacy training during an additional sixth year of pharmacy clerkships in the hospital.

Table 1. The minimum required credit hours per knowledge areas for a pharmacy study plan bachelor degree in Jordan as required by the Jordanian HEAC⁽¹¹⁾

Knowledge area	Credit hours
Basic domains	98
Chemistry (pharmaceutical and medicinal): Physical Pharmacy/ Organic Chemistry/ Analytical Chemistry /Medicinal Chemistry/ Instrumental Analysis/ Biochemistry-Clinical Biochemistry/ Chemistry of Natural Products/ Drug Design	30
Pharmaceutics (pharmaceutical and medicinal): Pharmaceutics/ Pharmaceutical Technology Cosmetics/ Biopharmaceutics and Pharmacokinetics/ Pharmacoeconomics	22
Medical sciences: Anatomy and Histology/ Physiology and Pharmacology/ Pathophysiology/ Applied & Pharmaceutical Microbiology/ Toxicology Immunology / Clinical Pharmacy	34
Advanced Pharmaceutics: Pharmaceutical Technology / Pharmaceutical Bio-Technology / Pharmaceutical Marketing, Homeopathic Remedies	12
Elective courses by department	9
Supportive domains: General chemistry, Biological sciences, Math, Physics	12
Practical courses not less than	15%

Some health systems in developing countries do not recognize pharmacists as part of the integrated healthcare team, with patient centered pharmaceutical care just emerging, and the perceived status of pharmacists still well below that of their medical peers⁽¹³⁾. On the same philosophy, the introduction of doctor of pharmacy degree programs in developing countries faced many critics in terms of education quality; opportunities and environments for clinical learning experiences; job opportunities; and professional inequalities being at the center of the debate⁽¹⁴⁾. Furthermore, although clinical pharmacists are still hardly recognized as health-care professionals to work side by side with physicians, PharmD programs increase acceptance particularly after recent adoption of clinical pharmacy by MoH. The implementation of this new degree has been due to

demand for more ‘‘talented’’ pharmacy graduates⁽⁹⁾. Although students still mainly relied on classroom teaching and devoted little time to self-directed study⁽¹⁵⁾, several pharmacy study plans and educational programs are beginning to more actively promote critical thinking, problem-solving skills and harnessing the use of amazing new computer technology for the purposes of online course delivery and management (e.g., Blackboard) is becoming more common in Jordan. But as there is no proper and clear job description for clinical pharmacists versus pharmacists, the acceptance of PharmD by healthcare professionals particularly physicians is still unclear⁽¹⁶⁾. On the other hand, it was concluded that a generation of PharmD students from Jordan universities reported a future aspiration to work as a hospital pharmacists, but also reported unrealistic salary

expectations compared with current salaries offered in Jordan⁽¹⁷⁾. Fortunately, pharmacy accreditation standards already mandate that graduates be able to provide patient-centered and population-based care. However, strategies to deliver that care are changing and curriculums must keep pace⁽¹⁸⁾.

Traditionally, although bachelor of pharmacy programs in Jordan are accredited by the HEAC, their curricula are focused on biomedical and pharmaceutical sciences and short in clinical, administrative, and experiential courses⁽¹⁹⁾. In addition PharmD programs are completely clinically oriented. So, in order not to compete with other pharmacy schools in Jordan, but rather integrate with them; worked with other 2 governmental universities in Jordan (Hashemite and Mu'ta), Yarmouk University reopened its pharmacy (and medicine) schools in 2013, but in a different approach i.e. introducing new tracks of pharmacy education: industry and business.

Lack of literature i.e. evidence-based resource informing on the definitive knowledge and skills that a Jordanian pharmacist must acquire to be prepared well to be ready to practice, unrealistic income for hospital and community pharmacy based workers compared to the average monthly income in Jordan⁽²⁰⁾ while much better salaries are paid to graduates who work as medical representatives⁽²¹⁾, the global shift towards what is called "need-based" education and the need to face market demands, all these become the drive for the change. The latter, motivate not only curriculum development evolution, but also revolution⁽²²⁾, the theme was "Think global act local". The time has come that pharmacists cannot be satisfied with being "drug experts" only, this perception, determination, conviction and inner drive accompanied with strong motivation for academic progression as well as experience will make the change (the author has a long experience in academia, pharmaceutical business as well as industry in the region).

Identifying locally determined needs and services and using those to facilitate comprehensive education

development and achieving competencies is vital particularly at a time of scarce resources in a country like Jordan⁽²³⁾. Needs-based education is a strategy for an assessment of the needs of the community and then development, or adaptation, of supporting educational systems accordingly. This requires ongoing consultation and co-operation between related stakeholders including higher education policy makers. Limitations exist, limited literature –as mentioned- and the culture of resistant to change in traditional academic environments may resist the implementation of this outcomes-based education⁽¹⁴⁾. As mentioned above, although basic minimum requirements for pharmacy education are clearly announced by HEAC⁽¹⁰⁾, there is no definitive list of competencies that a Jordanian pharmacist must acquire to be ready to work in the pharmaceutical market. Because of the latter, comparative analysis are needed i.e. combining interviews with stakeholders in the pharmaceutical industry with the current study plans of several pharmacy schools in Jordan and the region (e.g. King Saud university of Saudi Arabia; ranked first in the Arab World and one of the top 300 worldwide; 24). Interviews with all stakeholders of pharmacy profession in Jordan (multinationals, pharmaceutical manufacturers, regulators, drug stores i.e. distributors, community pharmacies, chain pharmacies, hospitals...etc) were focused on one major question: upon recruiting a fresh pharmacy graduate, what knowledge, skills and practice you need him to know?

"Based on opinion" wider stakeholder input into development and modification of pharmacy education curriculum ensures the importance of policy-maker and regulatory relationships with local community⁽²⁵⁾.

The role of patients in the education of health professionals has been changing and increasing over recent years. However, the involvement of patients in curriculum development, program design, or assessment is less utilized⁽²⁶⁾.

In order to identifying market needs, we have to understand the healthcare and pharmaceutical sector in Jordan.

Healthcare system in Jordan

The health sector in Jordan is well developed in terms of legislation, structure, and function. However, the system is highly fragmented both between and within public and private programs. The majority of health expenditure and financing is through the public sector⁽²⁷⁾ which accounts for 62% of health funding compared to 34.5% by private sector (2011). In the public sector, the main entities both financing and providing care are the Ministry of Health (MoH) (which is composed of tertiary hospitals, primary health care centers and rural health posts), Royal Medical Services (RMS; Military sector), Jordan University Hospital (JUH) and King Abdullah University Hospital (KAUH) representing 37%, 27%, 21% and 15.5% of drug expenditure, respectively^(3, 28, 29).

The pharmaceutical sector is highly regulated and organized through detailed laws and regulations governing both public and private sectors. The Jordan Food and Drug Administration (JFDA), a semi-independent body with its board of directors headed by the Minister of Health, is the formal medicines regulatory authority as outlined by the JFDA Law⁽³⁰⁾. Since its inception in 2003, the JFDA has built on existing laws, including the Drug and Pharmacy Law⁽³¹⁾, with detailed legislation and guidelines covering nearly all aspects concerning medicines. As such, the JFDA is mandated to execute existing legislation concerning medicine quality assurance, registration, importation/exportation, and pricing. In addition, the JFDA carries out inspections of local pharmacies and manufacturing sites, both locally and internationally, to confirm compliance with the national rules and regulations. Procurement for the public sector is carried out through the Joint Procurement Department (JPD), which was established in 2004 and carried out its first tender in 2007. A laboratories directorate within JFDA also was established in 2013 and new committees were created to upgrade standards and regulations as per one of the strategies at JFDA to continuously develop and guidance according to scientific and international standards⁽³²⁾.

Recently in the last decade, chain pharmacies began to spread in Jordan with many professional chain

pharmacy firms, at the same time the curricula in many pharmacy schools evolved and started to introduce pharmacy practice courses⁽²¹⁾.

Pharmaceutical business career path including working in (pharmaceutical marketing and promotion, regulatory affairs and tenders purchasing, establishing your own pharmacy organization) seems to dominate pharmacy recruitment direction in Jordan. The services required to meet those needs, competencies necessary to provide these services and the education needed to ensure this must be considered⁽⁹⁾.

Unfortunately, there is a huge gap in incorporating subjects related to business in the pharmacy curriculum. The major challenge to offering such courses in schools in developing countries is the lack of awareness and perceived importance of such topics by pharmacy educators themselves. Furthermore, the mentality among pharmacy educators still perceives pharmacy as only a “formulation and chemistry” based subject or a lab work. To provide basic competency and skills to future pharmacy practitioners, there is a drastic change of mindset among some educators that is needed to have a more balanced curriculum to foster the competency of pharmacy practitioners. More pharmacy educators and leaders need to come forward and advocate the importance and needs of such courses in existing pharmacy curricula⁽³³⁾.

When discussing practice models, many key professional questions will be addressed with the purpose of developing a vision and strategy for future pharmacy practice and to what extent should the pharmacist accept responsibility for both clinical and other new tracks⁽³⁴⁾.

Pharmacy curriculum -Yarmouk University

(http://admreg.yu.edu.jo/en/index.php?option=com_docman&task=cat_view&gid=277&Itemid=159)

“Originate modernization-modernize originality”

The vision is to provide a distinguished pharmaceutical education coping with modern developments in the profession, both locally and regionally, toward qualified pharmacists in the area of

pharmaceutical business and industrial pharmacy representing a "cornerstone" in a recognized healthcare system.

The mission is to contribute to the comprehensiveness of the university in the education programs, and to achieve excellence in academic and applied pharmaceutical programs based on scientific research through Pharmaceutical Business and Industrial Pharmacy tracks, anticipated to be a complementary to different modern aspects of the profession of pharmacy in Jordan as well as in the Arab world.

The goal is to create a highly professional generation of pharmacists coping with the current and future directions of the pharmacy profession toward serving the local and regional community, and to encourage continuous pharmaceutical education in order to keep up with the new developments in pharmacy, and consequently improve the profession to provide a high-quality pharmaceutical care. The latter can be achieved by attracting distinguished students for both Pharmaceutical Business (marketing and promotion, economics, legislations, establishing a pharmaceutical organization and managed it) and Industrial Pharmacy (pharmaceutical technology aspects). Promoting awareness among students of the new coming areas of the pharmacy profession, and train them in the pilot plant at the faculty as well as in different pharmaceutical organizations (factories, drug stores, firms, pharmacies) and specialized pharmaceutical research centers. Consequently, graduating qualified and skillful pharmacists to satisfy local, regional and international markets, especially in the area of pharmaceutical business and industrial pharmacy.

The new pharmacy study plan at Yarmouk

The total credit hours for pharmacy are 165. In addition to the minimum required core credits as per Jordanian HEAC, the following new courses were developed.

- **Core (mandatory) courses**

High-speed Internet access is increasingly mobile

because of smart phones and other wireless devices, making it easier for patients to collect personal health data at any time and from almost any place, and make data-bases information available for health & policy decision makers improve outcomes⁽¹⁸⁾. Harnessing the new information technology to serve patients and improving their communications with physicians and pharmacists, drive the development of **(Pharmacy informatics)** course in which students studying how pharmacist can utilize knowledge about drugs and their uses into modern information technology to improve patient care through ensuring safe and effective use of drugs, reduction of medication errors and support evidence-based health decisions leading to efficient use of resources and reducing costs. This course provides the basic concepts in understanding, developing, implementing and maintaining pharmaceutical information systems such as electronic prescribing, International Classification of Diseases (ICD) coding, patients registry and their health states electronically. Healthcare professionals communication with each other as well as with patients safely, accurately, smoothly and quickly by harnessing modern technology.

Main principles of business: marketing, economics, management, accounting and finance introduced in a simple and comprehensive way including their need and applications in pharmacy through a **(Principles of Business for pharmacy)** course.

Having high quality pharmacy production with very high percent of export, and been a member in the World Trade organization (WTO) since 2000⁽³⁵⁾, Jordanian pharmacists need to study Jordanian Drug and Pharmacy Law and legislations to practice the profession of pharmacy in the Jordan. Also in order to learn the principles of intellectual property and its applications in the pharmaceutical industry, both locally and internationally, **(Pharmaceutical legislations and intellectual property)** course discusses the importance of intellectual property in the pharmaceutical R&D issues, patent protection, data and trade mark exclusivity, and its impact on the marketing strategies of the Jordanian pharmaceutical industry.

Most of the pharmaceutical stakeholders in Jordan express their bad experience in dealing with fresh pharmacy graduates who know nothing about details of approving medicines freely sold in Jordan which increase the burden of training and keeping them. Another mandatory course (**Pharmaceutical regulatory affairs and quality control**) introduces technical and regulatory aspects relating to the preparation of pharmaceutical products' files for submission to health authorities regarding registration of originator or generic drugs, laboratory analysis, pricing and marketing, through reviewing local, regional and global legislations and regulations, and understanding the role of regulatory affairs department in pharmaceutical companies, in addition to medical devices & vitamins classification. The course also aims to inform students with knowledge and skills necessary to implement or maintain quality assurance in producing human therapeutic products and its importance in drug manufacturing. Students will learn how to develop a quality and audit plan, suggest and implement corrective actions strategically. In addition, this course familiarizes students about clinical research organizations (CROs) & institutional review boards (IRBs) and their mechanism of action.

In addition to safety, efficacy and quality, cost-effectiveness was recently introduced as a fourth hurdle in healthcare system. Basic concepts and applications of pharmacoeconomics, studying methods and techniques for evaluating costs and outcomes of healthcare interventions including economic evaluation, decision analysis and decision analytical models for determination and efficient use of resources, drug pricing policies and pharmaceutical expenditure control, as part of overall health spending were introduced (**Pharmacoepidemiology & pharmacoeconomics**) hand in hand with epidemiology, both descriptive and analytical, for infectious & chronic diseases; addressing disease transmission, geographic and demographic distribution of diseases, connecting the latter with suspected causes.

- **Pharmaceutical Industry track new developed courses**

Pharmaceutical companies make multi-million, even multi-billion dollar investments on a new drug. These investments can take more than two decades to play out. However, the macro-environment in which the industry operates is dynamic i.e. rapidly changing. Therefore, the industry, not only has to battle high attrition rates (only one in ten new Phase I drugs make it to the market), but also has to fundamentally rethink the R&D operating model and formulation strategies. Against the increasing industry market needs and the highly specific profiles' requirements, curricula pharmacy studies need to adapt to this expansion in a way that sharpens the skills of future pharmacy graduates by implementing new education tracks and teaching new adequate subjects.

Jordan pharmaceutical manufacturing is a well developed industry since 50 years. By implementing current Good Manufacturing and Practice (cGMP) world class competitive standards, and due to its high quality, excellent reputation and affordable prices, pharmaceutical industry in Jordan is a major contributor to the national economy, a round 80% of its production (by a total of 16 factories) is exported to more than 70 countries around the world including USA and European Union accounting for about 10% of total Jordanian exports ranking second to third⁽³⁶⁾. The latter and more than 300 pharmaceutical manufacturers exist in the Arab World, increase demands for pharmacy trained professionals in order to provide those manufacturers with technical expertise graduates. Understanding of how the pharmaceutical industry makes decisions on R&D, production and quality assurance, besides understanding the future challenges that the pharmaceutical industry faces and how to fill up the chronically increasing market needs as future pharmaceutical professionals in an applied vision.

Based on the above information, the following courses were introduced for students who will choose the pharmaceutical industry track as their fifth year elective track, so they will go deeper in this specialty knowledge wise as well as practice wise. They will study the

following courses that are not exist in other study plans in Jordan : updated **Good manufacturing practices (GMP)**: the concepts of good manufacturing practices for pharmaceutical products, their general principles and requirements according to the international standards including in process validation and production step wise inspection in order to obtain a high quality product. Also the corner stone of complying with these requirements that include: defining and monitoring all manufacturing procedures, training of operators & ensuring their competency as well as documentation & recording of all operations and its distribution. **Research and development in pharmacy**: studying research methods of the main scientific stages of production and developing a drug formula, followed by manufacturing, evaluation and conducting stability studies ending up with finished products approved by quality control and assurance. **Advanced Pharmaceutical biotechnology**: studying the techniques used in discovering and producing pharmaceuticals, bioequivalents and biosimilars. In addition, knowing how to formulate these products and the proteins used in preparing them and their purification methods.

• **Pharmaceutical Business track new developed courses**

In some developed countries, pharmacy curricula also have been changed by incorporating pharmaceutical sociology components, i.e. social pharmacy, to provide pharmacy undergraduates with more opportunities and exercises that promote constant interaction with communities⁽³⁷⁾.

Pharmaceutical business career fields include market access, drug stores (distribution and agency), sales and marketing, product management, drug information, export, training (product knowledge, selling skills), marketing services and support, and regulatory affairs.

The following new courses were introduced for students who are looking to work in the business filed of pharmacy either by working as medical representative career path way through export to marketing director or business development manager, regulatory affairs officer,

quality assurance liaison, or establishing his own pharmacy organization (factory, drug store, outlet, research and training centre...etc):

- **International pharmaceutical regulatory affairs** in which students were informed about principles of checking lists of international guidelines such as European Union and the US Food and Drug Administration used in preparing drug registration files for free selling (e.g. ICH guidelines). Also introduces local and regional medications' pricing reference countries.

- **Advanced pharmacoeconomics**: this course discusses basic and applied concepts of pharmacoeconomics and how to design cost effectiveness studies for healthcare interventions in order to inform decision-makers in comprehensive health planning and efficient use of available resources in providing quality health care service. In addition, learning the applications of technical evaluation and pricing policies for drugs. At the end of the course, students are required to present, analyze and criticize an international pharmacoeconomic evaluation publication regarding its adaptation to the local setting.

- **Health policy and management**: studying the basic principles of management, including organizational structure, job description, planning and organizing, as well as defining and specifying goals for preparing and implementing health policies, managing personnel in a predetermined time lined good governance, followed by periodic performance evaluation and make corrective measures accordingly.

- **Pharmaceutical promotion**: studying marketing and promotional mix elements from a pharmaceutical perspective, including personal selling techniques for sales call steps and skills. Introducing pharmaceutical marketing strategies, analysis of the marketing environment, its impact on future marketing planning as well as identifying doctors' types & behaviors and how to deal with them will be introduced in this course. Furthermore, to prepare pharmaceutical marketing plans and their applications in Jordan market.

- **Health services marketing**: studying the basic

concepts of marketing services and international marketing. This course introduces marketing strategies for health services in different health organizations both in primary and secondary health centers and hospitals. In addition preparing plans for marketing health services in order to improve patients' health care and quality of services.

- **Accounting and financial management for pharmacy:** studying the basic concepts of accounting & finance and its applications in managing pharmaceutical organizations' business. This course introduces the accounting and financial programs used for inventory management, procurement, future planning and investment opportunities. Moreover, preparing and analyzing main financial data, customer financial statements and budgets in a simplified way.

All and above, and for both tracks, another two courses must be taken consequently in the last semester:

- **Specialized training in either pharmaceutical business or industrial pharmacy:** in which each student spend 15 effective weekly specialized training hours for 14 weeks in any field of the tracks based on a preset program and under the supervision of a faculty member.

- **Graduation project in either pharmaceutical business or industrial pharmacy:**

Under direct supervision of a faculty specialized member, students will perform a full applied scientific research in one of the track fields including presenting the work and submitting a technical report based on scientific methodology followed by oral discussion. The latter will develop innovation and assist students to smooth entrance to work market.

Last but not least, special topics in pharmaceutical business or industrial pharmacy elective courses were also available as a selected specialized topic(s) pre-chosen by the faculty member, announced to students before registration after been approved by the department council in which students will be introduced to the latest scientific developments related to the topic(s).

CONCLUSION

Providing market driven study plan to serve the local, regional and international community by skilful professional pharmacy graduates will satisfy pharmaceutical industry needs i.e. right input will lead to the right output. Persistence toward successful implementation of this initiative in Jordan will encourage other areas of the world to follow as per their local market needs.

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الصيدلة الصناعية وأعمال الصيدلة: مسارات جديدة في التعليم الصيدلاني في الأردن

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ملخص

تهدف هذه الدراسة إلى تصميم وتطوير خطة دراسية للصيدلة بمسارات جديدة بناء على حاجات سوق العمل. لقد تم تحديد الاحتياجات والخدمات المحلية ليتم استخدامها في تطوير خطة تعليمية شاملة لدراسة الصيدلة تلبي احتياجات السوق. وتم عمل مقارنة تحليلية مع الخطط الدراسية لعدة جامعات في المنطقة، اتبعت بمقابلات مع كافة الشركاء في القطاع الصيدلاني لتقويم احتياجاتهم من خريجي الصيدلة.

اعتماداً على مبدأ موازنة مخرجات التعليم مع حاجات السوق Needs-Based Education، ومن خلال الاستشارة المستمرة والتعاون مع الشركاء في الصناعة الدوائية المحلية ووكلاء شركات الأدوية العالمية والمستشفيات والصيدليات بالإضافة لصانعي القرار في التعليم العالي، تم استحداث مسارات جديدة: الصناعة والأعمال وتطوير خطة دراسية شاملة قابلة للتطبيق والمتابعة.

الاستنتاج: إن استحداث خطة دراسية في الصيدلة بمساري الصناعة والأعمال مبنية على تطوير المهارات المهنية للطلبة من شأنها أن تلبي حاجات السوق المحلي والإقليمي والدولي. كما أن المتابعة الحثيثة لتطبيق هذه الخطة والتأكد من نجاح مخرجاتها سوف يشجع الدول الأخرى أن تحذوا حذو الأردن لتطوير خطط تلبي حاجات بلدانهم.

الكلمات الدالة: الخطة الدراسية، الصيدلة، مسارات جديدة.

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