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PROGRAMME DESCRIPTION

Pharmacy education shift during times of pandemic and collapse: A perspective from a school of pharmacy in Lebanon

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Abstract

Introduction: The health and economic crisis in Lebanon during the COVID-19 pandemic has had detrimental effects on many sectors including higher education. This report presents the major changes in teaching/learning undertaken by three departments of the bachelor programme in a school of pharmacy in Lebanon to cope with uncertain times. **Description:** The educational process was modified from autumn 2019/20 to spring 2020/21, with economical instabilities and the emergence of COVID-19, where regular teaching and summative assessments were completely and forcefully switched to remote and online. **Evaluation:** Although a grade trend showed some changes in evaluation with the crisis, grades returned nearly to normal upon adopting the completely online system. Technical support and training for the faculty were required to help cross transitioning periods and maintain the quality of the programme. **Conclusion:** The crisis and the pandemic influenced pharmacy education, but gave students and faculty the chance to learn and utilise modern information and communication technology (ICT) educational tools.

Introduction

The current pandemic caused by Coronavirus Disease 2019 (COVID-19), and the associated measures of physical distancing, have both imposed unique challenges on educational institutions around the globe (Karaoui & Chahine, 2020). Schools and colleges of pharmacy have responded to the pandemic to ensure sustainable education through a quick shift to remote learning options and by designing contingency plans (Lyons *et al*., 2020). Both pharmacy faculty and students alike had to adapt to a new teaching and learning environment (Kawaguchi-Suzuki *et al.*, 2020). Not only were the aspects of didactic instruction, assessment tools, services, and scholarship affected, at the peak of the pandemic, restrictions were also imposed on all higher education institutions and teaching hospitals, stressing the need for alternatives in experiential training (Rabbani *et al.*, 2021).

In Lebanon, a quite exceptional reality is superimposed on COVID-19, where the economic, political, social, and health circumstances are posing strenuous challenges (Fawaz & Samaha, 2021). The academic years 2019/2020 and 2020/2021 were extremely challenging for the country, with unprecedented changes and uncertainties caused by the national protests and the financial crisis that started on 17 October 2019, and

also due to the COVID-19 pandemic after the official declaration of the first positive case in February 2020. Consequently, a governmental general lockdown was imposed on all country sectors, including universities (Hammoudi Halat *et al.*, 2020). Moreover, a shattering blast that was caused by a massive explosion in the seaport of Beirut, Lebanon's capital city, in August 2020, has worsened both the economic and health situation in the country. The cumulative effect of all these adversities has caused a collapse in Lebanon's social and economic sectors, and education is not an exception.

In view of such challenging situations, the School of Pharmacy (SOP) at the Lebanese International University (LIU), with two campuses in Beirut and Bekaa, a rural area of the country, undertook a restructuring of the Bachelor of Pharmacy (BPharm) programme's educational process. The aim of this structural adjustment was to create a prompt and unified transition from the normal face-to-face to a remote and online mode of instruction without significantly compromising the quality and integrity of the programme.

In Lebanon, prior to crises and pandemic times, the success of pharmacy education was attributed not only to the diverse academic structures/curricula but also to sociocultural perceptions (i.e. status and knowledge), organisational licensure (e.g. Lebanese Order of Pharmacists and Lebanese Board Examination - Colloquim), and international recognition (e.g. the Accreditation Council for Pharmacy Education–accredited LIU School of Pharmacy and French government-affiliated Saint-Joseph University Faculty of Pharmacy). These factors have initiated a notable flow of students toward pharmacy education with the positive momentum that Lebanese universities have created (Khachan *et al*., 2010).

Recently, and to maintain such long-lived success, a call for pharmacy curricula reforms, postgraduate training, recognising pharmacy specialities, organising the profession, and assessing advanced competencies was launched. In addition, an update of policies and regulations, a cultural reform, and a national pharmacy research strategy were also delineated as essential steps toward modernising pharmacy education (Sacre *et al.*, 2021). A road map with practical solutions was also suggested, where core and specialised competencies were assessed through a licensure examination, to scale-up pharmacy education in Lebanon and produce practice-ready pharmacists (Sacre *et al.*, 2020). Nevertheless, the political and economic downfall, monetary collapse, hyperinflation, depletion of hard currency, and cabinet resignation starting in October 2019, coupled with the consequences of the pandemic, all caused a decline in the country's fortunes and were harsh on the educational system, including pharmacy education.

The purpose of this communication is to present, in a concise and brief manner, the changes undertaken by the three SOP BPharm programme departments during the last two academic years in response to the pandemic and the Lebanese collapse. This report will present the major changes done in teaching/learning and assessment during the aforementioned period, in addition to faculty insights and satisfaction.

Description of programme changes

The BPharm programme courses at the SOP are delivered by the three departments of the School: The Pharmaceutical Sciences Department (PSD), the Biomedical Sciences Department (BSD) and the Pharmacy Practice Department (PPD). The authors' describe here the modifications done to the educational process across the three departments during the period from Autumn 2019/20 through Spring 2020/21.

Autumn 2019/20 term: The start of the crisis

Unexpected university closure started after three weeks of the commencement of the Autumn 2019/20 term due to economic deterioration, road closures by protests and serious political and social collapse that started in the country. To accommodate the lost time, course syllabuses at the three departments of the SOP were trimmed. Instructors were asked to summarise some course material and avoid unnecessary details to ensure delivery of courses within a shorter period while maintaining accomplishment of each course's intended learning outcomes without compromising the quality of the programme. Also, and to account for the lost time, assessment methods were also slightly modified during this term. While regular summative assessments consisted of two exams and a final exam in most courses, those were substituted by one midterm exam and another final exam to maintain time effectiveness.

Spring 2019/20 term: The shift to emergency online education

The first three weeks of this term were normal, yet suddenly, the country lockdown started as a result of the COVID-19 pandemic. LIU, as a whole, decided on the shift to online education; an online learning committee and online chat and advising tools were established to provide guidance for students and faculty on remote instruction. To cope with this

institutional change, chairs of the three departments were in charge of extensive explanation of the online shift to course instructors and coordinators. As such, the following steps were taken: 1) WhatsApp groups were created for departments and for individual courses to allow direct and quick communication; 2) instructional video recordings and illustrations were shared as tutorials to train with, using the online platform chosen for remote instruction, which are Google Classroom, Meet, and Forms that LIU already had incorporated within its Google Workspace and had been available for all faculty and students.

The chairs of the three departments firstly sent an e-mail notification to instructors asking them to use Google Classroom and invite all students, and to orient about using synchronous (live meetings with recording) or mixed synchronous and asynchronous (live meetings and voice recordings sent over weekends) methods of remote instruction. The asynchronous mode was an alternative used to accommodate failures mostly due to weak bandwidth and Internet connection. Also, to maintain a "triage" mode of education and remediation, where communication and reassurance are indispensable, instructors were advised to calm down and comfort students and to lessen the stress and anxiety of exams, grades and class absences during the first few online sessions. This was an emergency period, and the focus was oriented towards bringing new tools to the students and adopting and adapting to the new norms. Additionally, the chairs organised meetings for instructors of individual courses, as well as informal communication through texts and phone calls, to discuss online teaching with respective instructors and consider essentials for each course during remote delivery. Specifically, the laboratory courses within PSD, and the pharmacy practice experiences (PPEs) and simulation courses within PPD received special attention.

There was an extensive discussion regarding shifting the hands-on experiments, patient cases, and virtual pharmacy to online and virtual mode. To set details even more obviously to students, a weekly online schedule was created for each course, added to the regular course syllabus. The purpose of this schedule was to let students know the expected pace of the course, recordings to be received if any, and online meetings schedule and frequency. To effectively tailor the online learning process, instructors were requested to fill a form about their feedback after one week on the commencement of online teaching (course progress, methods of online instruction, attendance, student feedback comments, etc.). Feedback from instructors was used to elaborate and improve online teaching. This feedback was discussed at the level of SOP governance, then in individual meetings with course coordinators, instructors and in focus groups as relevant per each course.

Once instructors and students started to adapt to remote teaching and learning methods, attention was directed towards adjusting and implementing new and relevant assessment tools. Upon extensive discussions among the SOP council and faculty, course assessments were modified to match the new onset of online learning, with most assessments revisited to include assignments, projects, case discussions, presentations, participation, and/or open-book exams. As a summative assessment tool, one or more quizzes and a single final exam were given online via Google Forms or Moodle. The weight of the final exam was adjusted to 30% of the total course grade, taking into consideration the stress and wellbeing of the student's mental and emotional conditions due to the crisis. The chairs shared tutorials on exam preparation and grading with instructors. Table I includes a sample of modified assessment tools.

Table I: Sample of assessment tools

Assessment Tools	Comments
Reports	As needed for each laboratory course.
Quizzes	Should be multiple-choice, and each course has one or two quizzes. They typically cover one to two chapters. The deadline to submit should be one hour (during the afternoon to avoid overlap with courses, e.g. at 17:00).
Assignments	May include any type of questions and should be a minimum of one assignment per course. The deadline to submit should not exceed seven days. They could include searching for data not directly mentioned in the lectures.
Participation	Refers to submission of different assessments on time but NOT to live session attendance due to technical/connectivity issues.

Summer 2019/20, Autumn 2020/21, and Spring 2020/21 terms: The adoption period

During this period, online learning was continued at LIU as a whole and at SOP due to the rise in COVID-19 cases in the country. The adoption of online teaching methods was now the new norm. Students and instructors were gradually and smoothly getting used to the new structure of the pedagogical process. As such, it was feasible that assessment methods would revert to normal, with exam 1, exam 2, and the final exam. All types of assessment used during the triage period, like projects and assignments, were eliminated to re-initiate a normal course evaluation. Moreover, exam administration was further refined by using exam

versions (shuffled sections of exams and modified exam questions) for the purpose of increasing exam integrity and maintaining the highest possible degree of transparency in grading.

Autumn 2020/21 was the first term to implement domain distribution of exams, whereby each exam tests a defined set of intended learning outcomes. Chairs of departments trained instructors to use this new methodology needed as a part of quality assurance and to test students' fulfilment in relation to the intended course learning outcomes that can be monitored through an automated system. Tutorial videos were prepared and shared for this purpose. Day-in and day-out communications and follow-ups were also carried out. Additionally, Autumn 2020/21 and Spring 2020/21 terms witnessed a cluster of activities and exams done face-to-face with small cohorts of students, under a plan implemented in response to directives/recommendations from the Lebanese Ministry of Education and Higher Education. For this purpose, a number of experiments within practical courses, limited face to face case discussions within PPEs, and some exams were conducted on campus. A full hygiene guideline was also circulated and implemented to ensure the safety of attending faculty and students. The timeline in Figure 1, illustrates the changes implemented across the BPharm departments during the whole uncertain period starting Autumn 2019/20 till Spring 2020/21, with major shifts in teaching and assessment methods.

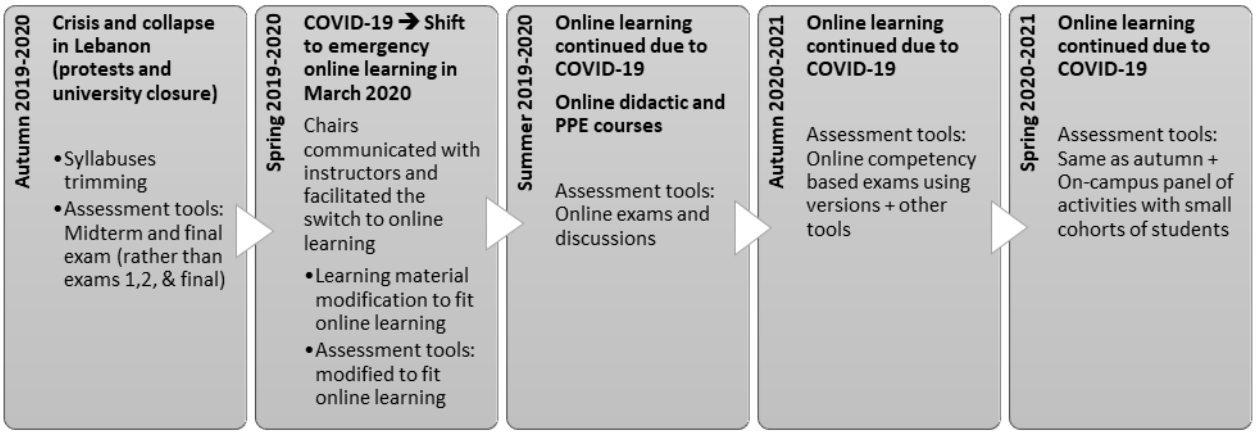

Figure 1: Timeline of changes in the educational process at the School of Pharmacy during the period of Lebanese crisis and the shift to online education

The experiential education at the school of pharmacy was tailored to fit the lockdown. The pharmacy practice experience courses transferred to a remote format, where preceptors resorted to weekly virtual meetings for students in the community internship and three to four meetings per week for those in the hospital internship. All case discussions, journal clubs, topic presentations, patient monitoring, and patient education assignments were done online. Preceptors prepared cases and posted them ahead of the scheduled live discussions and used active learning methods to engage students. The pharmacy dispensing practices course (virtual pharmacy) was also delivered remotely, where real community cases were posted for students, and instructors initiated from them an active discussion. To maintain the integrity of the experiential education, the final conclusive assessments were done face-to-face on campus with small groups of students.

Evaluation

Grade trend

A grade trend was sought to check changes in course grades across the uncertain period of the past two academic years compared to previous years. There was some deviation in Autumn 2019/20 from previous autumn terms as a result of many factors (midterm exam only, material trimming, some leniency adopted due to the situation in the country). Although some grade inflation was noticeable in Spring 2019/20 (first term for online education), the grades returned to near normal in Spring 2020/21, as shown in the samples of grades in Table II, which depicts an approximately similar trend between Spring 2018/19 (on-campus or "traditional") and Spring 2020/21 (entirely online).

Table II: Comparison of grade trends across three courses offered in the Spring term of the BPharm programme over three academic years[†]

Course title	Term	Course delivery	Average final grade (%)	Passing rate (%)	Failure rate (%)	Withdrawal rate (%)
Medicinal chemistry	**Spring 2018/19**	Normal	71.8	70.6	23.8	10
	Spring 2019/20	Remote - triage mode	78.3	96	4	0
	Spring 2020/21	Remote - adoption mode as new normal	691	70	28.6	3
Interpretations of lab data	**Spring 2018/19**	Normal	72.7	74	18.2	7.8
	Spring 2019/20	Remote - triage mode	83.5	96.4	3.1	0.5
	Spring 2020/21	Remote - adoption mode as new normal	72.2	77.8	18.7	3.6
Pharmacotherapeutics III (Cardiology/nephrology)	**Spring 2018/19**	Normal	70.8	73.6	21.3	5
	Spring 2019/20	Remote - triage mode	83.2	97.4	2.1	0.5
	Spring 2020/21	Remote - adoption mode as new normal	73.5	79.2	18.1	2.8

[†]A comparison of grade trends across three courses offered in the Spring term of the BPharm programme, with an indication of the course delivery mode. The grade trends shown indicate a similarity between achievements during Spring 2018/19, a completely normal term, and Spring 2020/21, where online education was considered as the new normal.

Survey of instructor feedback

At the end of the Spring 2020/21 term, each BPharm department chair shared a survey with instructors within the department to get their feedback on issues related to their experience with online learning. The survey was authored by the department chairs in Google Forms after deliberation about its structure and contents. Instructors were notified about the survey via e-mail, and through different department groups, then it was shared to receive instructor responses during the last week of the Spring 2020/21 term. Questions within the survey mainly focused on the type of online delivery, active learning methods, digital tools, student engagement with online learning, exam comments, student misconduct, coordination, satisfaction with online course delivery and online exams. A Likert scale of one to five was used to measure satisfaction. Open-ended questions were also used to allow instructors to comment on the above issues or any other concern that they would like to share with the SOP.

The survey was sent out 81 times to reach instructors teaching all courses in the different departments. Sixty-six responses were received, with a response rate of 81.4%; the key findings from the survey are presented in Table III.

Overall, instructors adopted and became familiar with remote instruction for the three terms following the onset of COVID-19. They believe it was satisfactory to deliver course material given the circumstances of the pandemic and the country. Moreover, many reported that live sessions were recorded and posted for the students to view at their convenience. Some have reported making online session attendance mandatory and assigning a grade for it. Instructors also resorted to using videos from YouTube or instructor-recorded videos to deliver hands-on work, like in PSD laboratory courses and pharmacy simulation courses, though this implied more effort and preparation on behalf of the instructor. For practice experiences, virtual meetings held three to four times per week were used for interactive case discussions, journal clubs, topic presentations, patient monitoring, and other active learning methods. To improve course delivery, instructors utilised available digital tools to facilitate students' learning through the integration of information in a competitive and active environment. Faculty expressed that such methods rendered concepts clear and understandable to students and added vitality to the remote class environment.

Table III: Instructor feedback at the end of Spring 2020/21, regarding experience and satisfaction with online education

Survey item	Instructor responses	%
Methods of online delivery	Mixed (synchronous + asynchronous)	64%
	Synchronous only	36%
Active learning methods	Case discussion	67%
	Presentation	57%
	Video	44%
	Instructor-recorded video	30%
	Reports	19%
	Graded assignment	37%
	Project	19%
	Flipped classroom	2.7%
	Problem-based learning	9.3%
	Study evaluation	1.3%
	Journal club	17%
	Real prescriptions	1%
	On-campus activity or exam	8%
	Others	8%
Digital learning tools	Whiteboard	46.3%
	Canvas	1.3%
	Padlet	7.7%
	Puzzle	1.3%
	Peardeck	2.7%
	iTeach	1%
	Online resources	1.3%
	Google form shared doc	3.7%
	Others	6.7%
Platform of delivery	Google Meet (Hangouts)	92.3%
	Zoom	7.7%
Student engagement	Variable: from 15% in didactic courses up to almost 100% especially in laboratory courses	
Student misconduct	None	
Satisfaction with course coordination	92. 3% satisfied	
Satisfaction with online delivery	75. 7% satisfied	
Satisfaction with online exams	49% satisfied	

Nevertheless, instructors were concerned about student participation in live sessions. Active engagement in course work was variable according to the survey results, and in general, students' attendance and participation showed a promising start and then progressively diminished, perhaps due to overload and exams. Instructors believed that a platform of course delivery with breakout rooms greatly enhanced student engagement. For PSD laboratory courses, faculty mentioned that no online delivery could totally replace the presence of students in the laboratory, and therefore, more opportunities should be considered for realising experiments in the lab; the same applies to the pharmacy simulation laboratory. Some suggestions for the upcoming terms included using more resources and gamification in lecture delivery and adopting more flipped classroom techniques.

In terms of assessment, faculty repeatedly mentioned their anxiety about exam transparency, although they agreed that the online exam delivery was convenient for uncertain times. One instructor put it in words:

"*I cannot wait to go back to live exams because I think students can always find ways to cheat*."

This has been attributed to the fact that the grades of some students were not reflective of their real level, engagement, and attendance at live sessions. Instructors expressed their satisfaction with some on-campus final assessments realised in some courses, especially for graduating students. To maintain integrity and transparency of exams, it was suggested to have at least one on-campus assessment (similar to a final exam). Instructors recommended customisation of individual projects, as well as having exams done on campus in a paperless manner if online learning is continued next autumn. Faculty also preferred it if some activities within courses, like practical tests and presentations, could be done on campus to maintain the quality of the programme.

The findings reported in this study are aligned with those reported earlier about pharmacy education during the pandemic. For instance, Kawaguchi-Suzuki and Colleagues (Kawaguchi-Suzuki *et al.,* 2020), after their elaboration on pharmacy education during the pandemic in different countries, concluded that the pandemic forced both pharmacy faculty and students to adapt to a new teaching and learning environment. Pharmacy educators faced challenges and opportunities to convert their classroom experiences and student assessments to a remote format. The unique approaches taken to overcome difficulties showed pharmacy faculty members' resilience in the face of adversity and their determination to continue providing education to students. Areas needing further improvement for pharmacy educators were also highlighted and revealed in the wake of the global pandemic, making it likely to be a good time to reevaluate the overall impact of pharmacy education and bring all pharmacy educators together. Likewise, the changes adopted in the authors' learning system and described herein conform with what was described earlier about ensuring sustainable education throughout the pandemic. Like other educators, the

authors' have set aside some of their academic traditions to deal with the acute phase of the pandemic, and they have reduced, reused, recycled, and most importantly, renewed many of their methods. This is indeed part of the collective responsibility to prepare pharmacy students to be practice-ready and team-ready for now and for the next global pandemic (Lyons *et al.,* 2020).

It is worth mentioning that the changes documented here are not without losses on the overall educational process. The maintenance of student engagement online was a challenge to the faculty, as was the maintenance of e-documentation of all activities and assessments, especially with technical difficulties and bandwidth issues. Moreover, the real face-to-face contact was missing at the expense of increased screen time, as well as the interprofessional component of pharmacy education.

This evaluation does have limitations. First, this was the baseline report from the authors' school documenting faculty practices and perceptions regarding remote instruction. Accordingly, no benchmarking data was available for a comparison to be realised. Additional follow-ups by further surveys may allow a trend in remote education to be drawn, where major changes or deviations can be detected. Moreover, the authors' survey addressed only pharmacy faculty; a broader audience including faculty from supportive courses (like biology, chemistry, and statistics) and faculty from other pharmacy schools would be more representative of the overall portrait of pharmacy education during the online shift. Furthermore, improved and tailored surveys that tackle specifics of each department may better reveal the status quo and give implications for particular developments.

Conclusion and future plans

There is no doubt that the current pandemic has impacted all aspects of pharmacy education, and the authors' programme is not an exception. Didactic instruction, experiential education, and assessment have all been impacted, with both faculty and students navigating unchartered waters and facing various challenges. Meanwhile, they did have the chance to make use of the digital opportunities in an era when technology has profoundly affected education. In view of the numerous threats and distinctiveness of the Lebanese situation with the crisis touching personal and professional lives, pharmacy faculty need to retain the flexibility to cope with fluctuating times and embrace change. Support and training of faculty are ultimately required to help cross the transitioning periods and to take every measure to maintain the quality and authenticity of the educational programme. Specifically, workshops and applications to improve the expertise of faculty in online engagement tools, virtual pedagogical approaches, and online assessment methods are imperative. Monitoring of faculty stress, burnout, and isolation while working in a remote format should also be undertaken. Likewise, a support system for professional development and scholarly work should be well established in the workplace. The authors' believe that traditional teaching/learning and assessment in pharmacy education will not go back to how they were before the pandemic. Blended learning where the digital and modern ICT tools will be implemented more in programme delivery and students' assessment. Students, like faculty, should be ready to cope with and embrace such changes.

Ethical considerations

Ethical clearance of this programme description was obtained from the LIU SOP research committee (2020RC-051-LIUSOP).

Conflict of interest

The authors have no conflict of interest or financial disclosures to report.

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