



ORIGINAL ARTICLE

# Bridging theory and practice: Mixed methods approach to instruction of law and ethics within the pharmaceutical sciences



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**Abstract** *Background:* Professional responsibilities are guided by laws and ethics that must be introduced and mastered within pharmaceutical sciences training. Instructional design to teaching typically introduces concepts in a traditional didactic approach and requires student memorization prior to application within practice settings. Additionally, many centers rely on best practices from abroad, due to lack of locally published laws and guidance documents. *Objectives:* The aim of this paper was to summarize and critically evaluate a professional skills laboratory designed to enhance learning through diversity in instructional methods relating to pharmacy law and best practices regarding narcotics, controlled medications, and benzodiazepines. *Setting:* This study took place within the Professional Skills Laboratory at the College of Pharmacy at Qatar University. *Method:* A total of 25 students participated in a redesigned laboratory session administered by a faculty member, clinical lecturer, teaching assistant, and a professional skills laboratory technician. The laboratory consisted of eight independent stations that students rotated during the 3-h session. Stations were highly interactive in nature and were designed using non-traditional approaches such as charades, role-plays, and reflective drawings. All stations attempted to have students relate learned concepts to practice within Qatar. *Main outcome measures:* Student perceptions of the laboratory were measured on a post-questionnaire and were summarized descriptively. Using reflection and consensus techniques, two faculty members completed a SWOC (Strengths, Weaknesses, Opportunities, and Challenges) analysis in preparation for future cycles. *Results:* 100% (25/25) of students somewhat or strongly agreed that their knowledge regarding laws and best practices increased and that their learning experience was enhanced by a mixed-methods approach. A total of 96% (24/25) of students stated that the mixed-methods instructional approach should be

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continued in the future. The SWOC analysis identified the mixed methods approach and student feedback as strengths and opportunities, while resource shortages and lack of impact assessment were identified as weaknesses and challenges. *Conclusion:* Creative redesign of instructional methods pertaining to law and best practices was effective to achieve positive student perceptions regarding instructional methods and learning. Future cycles should include rigorous assessment methods to evaluate impact on student learning and practice.

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## 1. Introduction

Law and ethics are core components of health professions curricula worldwide. Graduating professionals must be able to competently adhere to legal frameworks regarding all practice considerations, including prescription and dispensing of medications (Austin et al., 2004a). While much of this can be learned through experiential training, theory and foundations are typically introduced within classroom settings (Ghallagher, 2011). It is also essential to give students foundations of laws and ethics prior to beginning experiential internships. Topics may include terminology, practice standards, legal frameworks, and professional ethics. The importance of this subject matter is demonstrated by incorporation of entry-to-practice examinations (PEBC, 2015; NAPLEX, 2015) and the requirement of many self-regulated states for candidates to pass jurisprudence examinations prior to eligibility for registration as a professional.

Pharmacy schools located in developed countries typically have established legal frameworks to guide instruction and assessment. However, those in developing countries (including Qatar) may not have firm laws, policies, or frameworks for the regulation of prescription and dispensing of medications (Kheir and Fahey, 2011). This poses extra challenges as curricula must include not only currently existing legal frameworks but also best practices from international settings to ensure graduates provide safe care and act responsibly as professionals within practice settings. Students in such settings must be able to decipher between what is legally allowed and what should be strived for in terms of best practice.

A literature review produced no articles describing instructional methods for teaching legal considerations for pharmacy practice. This finding suggests that law content is typically being given in a traditional didactic lecture format, as was the case with our own institution. However, learning theory proposes that all students do not respond to this form of instruction and that students may benefit from diversity in instructional methods (Romanelli et al., 2009; Pungente et al., 2003). Interactive and 'hands-on' learning may reinforce or solidify concepts difficult to simply memorize or apply based on traditional teaching methods. It is also known that diversity in instruction is typically perceived more positively (Austin, 2004b). Therefore, we hypothesized that diversity in instructional methods relating to legal content would result in enhanced learning and positive perceptions of pharmacy students in our program.

In order to address the concerns identified above, we recently redesigned instructional methods for our curricular content relating to laws and best practices for prescription and dispensing of narcotic and controlled medications. In

former years, this content was given in a lecture format that relied on students to memorize learned concepts through slides and small case examples. However, student feedback was negative with respect to the instructional design. Therefore, we sought to respond to student feedback and assess a creative approach to teaching laws and best practices at our institution. The aim of this paper was to summarize and critically evaluate a professional skills laboratory designed to enhance learning through diversity in instructional methods relating to pharmacy law and best practices regarding narcotics, controlled medications, and benzodiazepines.

## 2. Materials and methods

The laws and best practices pertaining to narcotic and controlled medications are taught within the Professional Skills series in the second year of four years of the Bachelor of Science in Pharmacy program. The content is allocated a single three-hour laboratory session out of a 45-h (15 week) course. The session leader is an Assistant Professor in the Clinical Pharmacy and Practice section within the pharmacy program and has practice experience in both Qatar and Canada.

The past content of didactic slides and case examples underwent significant revision to be formatted within a professional laboratory environment. Eight independent stations were developed based on the learning outcomes of the course and content session. Stations were designed to be highly interactive and incorporated innovative instructional methods, such as use of charades, reflective drawings, role-plays, and technology. Each station was developed by the session leader and independently peer reviewed by three separate faculty or staff (Clinical Lecturer, Professional Laboratory Technician, and Teaching Assistant). Modifications were made to both process and content components. Each station was assigned a total of 10 min. Stations were set between two professional skill laboratories (4 stations and 3 stations, respectively) and one faculty office (1 station) located adjacent to one another. The faculty office was used to confine the charades station to avoid students observing colleagues completing the station in advance of their own time. The session leader and each of the faculty/staff were each responsible for facilitating two stations each throughout the entire laboratory period. A summary of each station, associated learning outcome, and procedures is given in Table 1. Students were encouraged to create their own note sets during station activities for study purposes.

Students were divided into groups of 3 or 4 individuals and assigned to a starting station. The laboratory technician kept time and was responsible for moving students through the eight stations. After all students completed all stations, a large

**Table 1** Blueprint of learning activities during laboratory session.

Station	Learning outcome (s)	Activity	Resources required	Relation to Qatar
Role-play (ethical decision making)	To demonstrate competent communication skills with patients portraying drug seeking behavior	Assess and counsel a standardized patient regarding frequent refills of lorazepam and receive feedback from faculty and standardized patient	Standardized patient, prescription record, filled lorazepam prescription	Probing question: "In Qatar, lorazepam is only available from hospitals. What procedures could you implement to ensure safer care?"
Charades (authorized prescribers of narcotics and obtainers of narcotics from pharmacists)	To list persons able to prescribe narcotics and obtain narcotics from pharmacists	Pulling names of persons (i.e. doctor, veterinarian, patient, patient's agent) from envelope and having colleagues guess through silent acting	Facilitator, envelopes, types names of correct answers	Answers mirrored current laws in Qatar
Reflective drawing (persons able to possess narcotic and controlled substances)	To list persons able to possess narcotic and controlled drug substances	Students were instructed to draw a creative picture of those who they believe can legally possess narcotics and controlled substances	Paper, coloring utensils	Students completed this station based on current Qatar practices
Prescription check	To demonstrate good practice when checking prescription documentation for narcotic and controlled medications	Students receive paper prescription and must check using provided best practice resources to ensure it complies with standard requirements	Typed prescription, provision of best practice resources (Canadian prescription requirements)	Students prompted to develop a checklist that could be implemented with Qatar practice settings.
Dispensing record check	To demonstrate good practice when documenting dispensing activities for narcotic and controlled medications	Students receive paper dispensing record and must check using provided best practice resources to ensure it complies with standard requirements.	Typed dispensing record, provision of best practice resources (Canadian prescription requirements)	Students prompted to develop a checklist that could be implemented with Qatar practice settings.
Qatar knowledge test	To describe challenges for accessing national policies and procedures for prescription and dispensing of narcotic and controlled medications in Qatar	Students receive a list of questions to answer that outline known laws and policies for narcotic and controlled drugs in Qatar. Students provided with a laptop and/or iPad with internet access.	Device with active internet connection. Questions pertaining to local practice (i.e. quantity and route of narcotics allowed for outpatient use).	National legal frameworks and policies are poorly documented online. Therefore, the purpose of this station was to have students determine other resources they could use to find information.
Storage and destruction policies	To create national or institutional storage and destruction policies for narcotic and controlled medication according to international standards	Students provided with reference material on storage and destruction of narcotic and controlled medications. Students then asked to create policies for implementation within Qatar's practice sites.	Reference material	Students used knowledge of international standards to create policies for hospital, clinic, and community practice sites in Qatar.
Narcotic and controlled regulations chart	To describe prescription and dispensing requirements for differing levels of narcotic and controlled medications according to Canadian laws and regulations	Students used provided resources to complete a chart that included points relating to prescription writing, refill allowance, order requirements (written vs. oral), transfer allowance, and documentation standards.	Canadian reference material	

group discussion (facilitated by the session leader) reviewed learning outcomes and model answers for the eight stations. A question period allowed for further discussion regarding points addressed by the stations themselves.

Following the session, participants voluntarily completed an evaluation form (Table 2). Forms were administered and collected by the laboratory technician and included no identifying factors (anonymous). Subjects were not required to

**Table 2** Student evaluations regarding creative redesign of laboratory session.

Statement	Results
After completing this laboratory session, my knowledge regarding pharmacy laws and best practices has increased.	25 (100%) Answered 'Completely agree' or 'Somewhat agree'
My learning experience in this tutorial was enhanced by the mixed-methods approach for station design.	25 (100%) Answered 'Completely agree' or 'Somewhat agree'
The station I feel I learned the most from was <sup>a</sup>	Charades: $n = 10$ Narcotics chart: $n = 10$ Storage/destruction: $n = 8$ Prescription check: $n = 6$ Dispensing record check: $n = 4$ Role play: $n = 4$ Qatar knowledge test: $n = 4$ Reflective drawing: $n = 2$
The station I feel I learned the least from was <sup>a</sup>	Qatar knowledge test: $n = 10$ Role-play: $n = 5$ Reflective drawing: $n = 5$ Narcotics chart: $n = 2$ Dispensing record check: $n = 1$ Charades: $n = 0$ Prescription check: $n = 0$ Storage/destruction: $n = 0$
Would you recommend we continue this format to teach pharmacy law and best practices next year?	24/25 (96%) Answered 'Yes'

<sup>a</sup> Multiple choices allowed.

complete the form and the session leader was unaware of any subject not willing to complete the form. The form aimed to evaluate session content and logistics, as well as make recommendations for future laboratory cycles. Notes were also recorded throughout the session by the investigators and both met in person afterward to complete a SWOC (Strengths, Weaknesses, Opportunities, Challenges) analysis for improvements for future cycles. Both used reflection to generate SWOC points and consensus was required for points to be placed in the final analysis. If disagreements could not be resolved through discussion, the point was not included.

This project was deemed exempt from ethical review. However, all procedures occurred according to good ethical conduct, as described above. Students were assessed on content via a 5-mark allocation on a quiz for the Professional Skills course. However, these results are not reported due to university policies.

### 3. Results

All eight stations were implemented successfully and the professional laboratory session was run over a 3-h session, including a 15-min break at the midway point. A total of 25 2nd year students participated in the session and a response rate of

100% was received for the laboratory evaluation. Results are summarized in Table 2. Briefly, 100% (25/25) somewhat or strongly agreed that their knowledge regarding laws and best practices increased and that their learning experience was enhanced by a mixed-methods approach. The three stations ranked the highest were the charades, narcotics chart, and storage and destruction stations. The three stations ranked the lowest were the Qatar knowledge test, role-play, and reflective drawing stations. A total of 96% (24/25) of students stated that the mixed-methods instructional approach should be continued in the future.

In response to the open-ended questions, it was heavily reported that the role-play station did not offer a positive learning experience due to lack of time for feedback and student practice. Otherwise, students suggested that they 'choose their own groups' and 'more clear resources' to be given for each station. The results from the investigator SWOC analysis are given in Table 3.

### 4. Discussion

This paper summarizes and evaluates a creative approach to instructional design for laws and best practices, using regulations pertaining to narcotics and controlled medications as a prototype. To our knowledge, this is the first paper to report such an approach to curricular design for laws and best practices. It is also the first paper to describe an approach to teaching best practice to pharmacy students within a context that relies on international standards to supplement national legal frameworks.

Student perceptions regarding the positively perceived stations were both expected and unexpected. The charades station was likely to be ranked highly, due to the uniqueness of the instructional method and highly interactive nature. However, it was unexpected that the station relating to storage and destruction of substances, as well as the narcotic and

**Table 3** Results of SWOC analysis.

Strengths	Weaknesses
<ul style="list-style-type: none"> <li>• Creativity in station design, including learning style, complexity, and student interaction</li> <li>• Ability to incorporate many learning objectives in limited time</li> <li>• Use of multiple skill sets by subjects to promote mastery of presented content</li> <li>• Incorporation of independent learning</li> </ul>	<ul style="list-style-type: none"> <li>• Knowledge-based assessment methods</li> <li>• Time allotted for role-play and feedback</li> <li>• Lack of laboratory space for 8 independent stations</li> <li>• Noise and 'contamination' from stations located in same physical room</li> </ul>
Opportunities	Challenges
<ul style="list-style-type: none"> <li>• Positive student feedback regarding the mixed methods approach to teaching and learning</li> <li>• Availability of other law sessions for similar redesign</li> <li>• Departmental support</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of clear legal framework in Qatar</li> <li>• Ability to assess impact of learning on practice</li> <li>• Availability of facilitating staff</li> <li>• Student absence policies</li> </ul>

controlled drugs regulation chart was perceived favorably. Upon further analysis, it is possible positive results were obtained because these stations both contained resources that students could create note sets for and also related to practice in Qatar. This was facilitated by application questions requiring students to determine how material presented could be adapted in a Qatar setting. Based on these results, more application-based questions for each station will be incorporated for future cycles. With respect to resources, it is impractical to provide all resources to students, as one of the objectives of the laboratory session (specifically the Qatar Knowledge Test) was to have students identify online resources relating to practice in Qatar.

A major learning point from the session was the need to further refine the role-play station to better achieve learning outcomes. For next cycle, we recommend to have this station allocated 20 min, in order to maximize student involvement and provide ample time for feedback. Specifically, all group members could be instructed to co-counsel the patient within a 10–15 min period by asking probing questions and deciding on a management strategy. Subsequently, the standardized patient and observing facilitator could provide 5 min of constructive debriefing and feedback focused on both content and communication skills. This redesign would address the concerns noted by both students and facilitators during the current cycle.

The least preferred stations based on student perceptions were the Qatar Knowledge Test, Role-play, and Reflective Drawing. Modifications planned for the role-play station are described above. It was unexpected to investigators that the reflective drawing station was ranked low. However, upon reflection it is likely that students were not aware of the purpose of the station due to a lack of orientation. Therefore, future cycles should include a brief orientation of the station facilitator to inform students the purpose of the station and the intended learning outcomes. Although the Qatar Knowledge Test was ranked low, we believe that this station achieved its learning purpose to inform students of the scarcity of resources available to them within practice settings regarding local legal frameworks. As such, we plan to keep this station in future cycles using similar methodology; however, a short debriefing session will be incorporated that will have students brainstorm solutions to address inaccessibility of information (i.e. liaising with governmental authorities, ensuring hardcopies are kept within practice settings, etc.).

The SWOC analysis provides further insight and reflection for future modifications and improvement. While, many of the points were similar to those reported by students, some degree of mismatch was observed. Based on results obtained, it is evident that students placed value on stations that had easily answerable questions and resources available to support attainment of these answers. Faculty, however, placed value on stations that required independent thought and creative thinking to solve station objectives. By addressing the points described above, it is likely future cycles can close this mismatch through proper orientation, resource selection, and debriefing.

Limitations of this report must be addressed. First, assessment was limited to student perception and faculty reflection. While impact assessment within practice environments would be most beneficial, this was impractical due to the nature of the course within the 2nd professional year. As well, the 5-marks given to the session on a course-based quiz were irrelevant to assess learning other than knowledge retention that was achieved during the session. Future assessments could include in depth case discussions or performance on Objective Structured Clinical Examinations (OSCEs) pending redesign of the role-play station described above. Furthermore, performance on a well-designed, competency-based examination for laws and best practices could determine effectiveness of this teaching model.

## 5. Conclusions

Creative redesign of instructional methods pertaining to law and best practices was effective to achieve positive student perceptions regarding instructional methods and learning. Similar methods could be applied to other curricular areas, as well as other components relating to law, ethics, and best practices. Student and faculty feedback should be carefully considered in future cycles to enhance session learning outcomes. Pharmacy programs around the world should be encouraged to adapt similar methods to instructional design, in order to provide students with optimal learning methods and environments.

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