

INSTRUCTIONAL DESIGN AND ASSESSMENT

A Career Exploration Assignment for First-Year Pharmacy Students

Lydia Sholy, PharmD, and Rony Zeenny, PharmD

School of Pharmacy, Lebanese American University, Byblos, Lebanon

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Objective. To develop, implement, and assess student-learning outcomes from an assignment designed to expose first-year pharmacy students (P1) to a wide range of pharmacy career pathways.

Design. Students enrolled in a required Pharmacy Practice and Ethics course at the Lebanese American University chose 1 pharmacist career to investigate from a suggested list of 28 career pathways. Students completed a literature review on the selected career, interviewed a pharmacist practicing that career path in Lebanon, wrote a paper, and prepared and delivered a summary presentation to their classmates about the career pathway. Students peer evaluated their classmates after each presentation.

Assessment. More than 85% of the students scored $\geq 70\%$ on the assignment based on their achievement of student learning outcomes. Responses on an anonymous questionnaire showed that more than 94.6% of students were satisfied with the extent to which the course allowed them to meet the established learning outcomes.

Conclusion. A career exploration assignment provided pharmacy students with an opportunity to widen their knowledge and understanding of the different career pathways that are available for them.

Keywords: career, pharmacy, students, career pathways

INTRODUCTION

The roles and responsibilities of pharmacists are continuously adapting to changes within the profession.¹ Some of the major changes have included the introduction of automated drug dispensing systems in pharmacies, the expanding role and responsibilities of pharmacy technicians, and the availability of mail order and Internet pharmacies, all of which have freed up valuable time for pharmacists to focus on more patient-care—centered responsibilities.^{2,3} According to the US Bureau of Labor Statistics the number of pharmacists is projected to increase by 25% between 2010 and 2020, compared to an increase of only 14.3% among all other occupations. Furthermore, pharmacists are growing in number, with an expectation of 139,600 job openings resulting from growth and replacement of retirees in the profession.⁴

The majority of pharmacists work in community pharmacies,⁵ yet there is an unprecedented demand for pharmacists in a wide variety of different settings such as academic pharmacy, ambulatory care, consultant pharmacy, federal pharmacy - armed services, federal pharmacy – public health, hospital and institutional pharmacy,

informatics,⁶ managed care pharmacy, and pharmaceutical sciences/industry.⁵

Pharmacy education will need to change with the profession as outlined by the Accreditation Standards and Guidelines for the Professional Program in Pharmacy Leading to the Doctor of Pharmacy Degree (Standards 2011) published by the Accreditation Council for Pharmacy Education (ACPE), the national agency in the United States for the accreditation of degree programs in pharmacy and providers of continuing pharmacy education.⁷ Specifically, standard 9 states that the curriculum must develop in pharmacy graduates “the ability to integrate and apply learning to both the present practice of pharmacy and the advancement of the profession.”⁸ Pharmacy education programs must respond quickly to the opportunities that develop in a changing health care and economic climate, and introduce these new career pathways to pharmacy students. ACPE standards also recognize and emphasize the role of faculty members in providing career guidance.⁷

Studies have demonstrated the need to introduce the different career pathways that students had limited knowledge of.^{9,10,11} The studies helped raise students’ awareness and helped build baseline knowledge to further develop the gained knowledge to implement into their future chosen careers. In addition, 1 study mentioned the pressure and time constraints on faculty with respect to teaching, research, and scholarship obligations that often became barriers to providing necessary student services.¹²

Corresponding Author: Lydia Sholy, PharmD, School of Pharmacy, Lebanese American University, Department of Pharmaceutical Sciences, PO Box 36 (F-31), Byblos, Lebanon. Tel: 961-9-547-254 ext. 2310. Fax: 961-9-547-256. E-mail: lydia.sholy@lau.edu.lb

The literature documents various ways of introducing students to different career pathways in pharmacy education. In Lebanon, as in other countries, pharmacists work in a variety of different settings. Example of such settings include hospitals, clinics, nursing home facilities (indirectly), armed services, public health services, government, professional organization management, community pharmacy, pharmaceutical sales and marketing, home health care, drug research and development, managed care, nuclear pharmacy, insurance companies, medication therapy management (MTM), and academia.^{13,14}

As career pathways were not clearly addressed as part of the pharmacy curriculum at the Lebanese American University-School of Pharmacy (LAU-SOP), and in alignment with the ACPE standards and guidelines, an assignment was developed as part of the Pharmacy Practice and Ethics (PP&E) course. Therefore, the objective of this study was to describe the development, implementation, and assessment of assignment-specific student learning outcomes (SLO) tailored to expose first year pharmacy students (P1) to a wide range of pharmacy career pathways. The outcomes for the assignment were that students would be able to: (1) describe pharmacy practice through its various aspects, (2) discuss present-day pharmacy practice and opportunities, and (3) describe pharmacist’s responsibilities to society.

DESIGN

Pharmacy Practice and Ethics was a required 2-credit course (30 contact hours total) offered in the spring semester to P1 students at the LAU-SOP, where all courses

are taught in English. All P1 students (74) in the academic year 2011-2012 were divided into 2 sections to allow an interactive learning process. The course provided an overview of pharmacy and was divided into 2 components: pharmacy practice, which was covered during the first 5 weeks of the semester, and ethics in pharmacy, which was covered during the remaining 10 weeks. In 2012, a career assignment was added to the pharmacy practice component of the course for the first time.

In order to work on this assignment, each student had to choose 1 pharmacy career from a list of 28 career pathways that had been suggested by the faculty members associated with the course (Appendix 1).^{9,15,16} Students were required to complete a literature review on their selected career and interview a pharmacist practicing that career if it was being practiced in Lebanon. The faculty members provided students with a set of questions (Table 1) for which they had to find answers from the literature search and/or during the interview. Based on their findings, they were required to write a paper detailing their work and give a 5-minute PowerPoint presentation to their classmates about the career opportunity they had researched, followed by a 5-minute question and answer (Q&A) session. Thus, by the end of the course, students were exposed to 28 career pathways.

An evaluation sheet was distributed to students to make them aware of the evaluation process and the assessment criteria used for grading their oral presentations. The assessment criteria used in this study was a modified version of a tool pilot tested in previous PP&E courses. The evaluation consisted of 13 Likert-type scale items and was divided into 2 parts: delivery of presentations,

Table 1. The Rubric Questions for a Career Assignment

Questions (N=74)	Points Allocated	Points Scored, Mean (SD)	Average Score, %	Confidence Interval (95%)
Describe the role of pharmacists in (ie, quality assurance) in Lebanon	1	1.0 (0.1)	95.6	[0.9 - 1.0]
List the activities that the pharmacist must perform to complete the indicated task / list the responsibilities of the pharmacist in the setting	2	1.8 (0.3)	89.2	[1.7 – 1.9]
Based on the literature, what do you think the responsibilities should be/include for that role?	1	0.9 (0.2)	89.5	[0.8 - 0.9]
Does the pharmacist role in this setting align with the literature? If not, is the pharmacist in Lebanon over performing or underperforming?	2	1.7 (0.3)	86.8	[1.7 - 1.8]
What do you think the pharmacist in this setting can still do but is not doing?	2	1.8 (0.3)	90.0	[1.7 - 1.9]
What are the barriers or obstacles pharmacist are facing in Lebanon and abroad in this setting?	2	1.8 (0.3)	87.7	[1.7 - 1.8]
Total	10	8.9 (1.2)	89.3	[8.6 - 9.2]

presentation content, and communication skills. The faculty members associated with the course provided detailed instructions on methods of conducting the interview. Moreover, students who required additional help or had specific questions met one-on-one with a faculty member.

The grade for the assignment was based on the students' ability to meet the learning objectives. The written and oral portions of the assignment were each worth 10% of the total course grade. The written paper allowed students to provide a more detailed work and supporting documents of their findings, whereas, the oral presentation allowed students to take charge in presenting the researched career, enabling active discussion among classmates. The grade distribution for the written part was based on answers to the set of questions provided using the literature, and the interview content. The grade distribution for the oral presentation was assessed based on various criteria including the student's ability to present the assigned career clearly, convey the required information about the researched career, and stimulate discussion through questions and answers, allowing active learning with classmates.

Students were also required to evaluate their peers' oral presentations, using the same evaluation form used by the faculty member. Students were assured that the peer evaluations of their presentation would not be used to grade their presentation, however, they would be used by the faculty members after the course was over as an assessment tool for the assignment. One faculty member graded the written portion of the assignment and the oral presentation, while the other faculty member associated with the course evaluated the written portion only.

EVALUATION AND ASSESSMENT

Questionnaires were created to determine students' satisfaction with achievement of learning outcomes and their perceptions regarding the assignment. The 2 different questionnaire instruments, administered in paper format, were elective, anonymous, and non-graded. Questionnaire A consisted of 4 Likert-type scale items to assess learning outcomes. It was given to students (all who attended the sessions) at the end of the course, after the last class session (end of 15th week). Students were asked to assess the 3 statements by choosing the reflective choice from strongly satisfied (4) to strongly dissatisfied (1) and not covered (0). Questionnaire B, assessed students' perception of the career assignment, and it was divided into 2 parts; part 1 consisted of 14 Likert-type scale items, with 4 indicating the learner strongly agreed with the statement and 1 indicating the learner strongly

disagreed. Part 2, consisted of 4 open-ended questions that asked students to provide additional thoughts or reflections not covered in the questionnaire items. Questionnaire B was given to all students who attended the last class session of the pharmacy practice part of the course (end of fifth week). (In order to provide clear explanation of the process, the questionnaires were labeled A and B according to the logical order of reporting results rather than time of administration.)

All statistical analyses were conducted using Triple One, Version 2 (MATRIX-TRC, Lebanon) an automated statistical reporting tool.¹⁷ Descriptive statistics such as means, standard deviations, and ranges were used to summarize the data. For the Likert-type responses, all responses with any degree of agreement were grouped together as positive responses, and all responses with any degree of disagreement were grouped together as negative responses. Chi-square test was used to assess the relationship between the peer and faculty evaluation. For all statistical comparisons, α was set at 0.05. Results were considered significant when $p < 0.05$.

The survey instruments and research protocol were granted approval by the Committee on Human Subjects in Research (CHSR) at the Lebanese American University. Because of the nature of the CHSR approval for this research project and the desire to obtain candid, anonymous responses, student grades were not linkable to the research survey data. As evidence of objective data for evaluation of student knowledge and skills, overall course grade distributions are presented in aggregate. As for the questionnaires, students' responses were considered confidential, and they were informed that data would be reported only in aggregate for purposes of statistical analysis and research publication.

All P1 students who enrolled in the PP&E course worked on the career assignment. Female students constituted 79.7% of the overall group sample. To determine if the learning outcomes were met, the level of achievements of the 3 student learning outcomes was calculated using the faculty member's grade from the 6 rubric questions related to the assignment. Students were able to score more than 86% on each question (Table 1). Direct assessment was then calculated based on the faculty grade on questions related to learning outcomes, as presented in Table 2. Students' scores of more than or equal to 70% on the designated SLO were reported as percentages. The results showed that 93.2%, 94.6%, and 96% of the students achieved the 3 SLOs, respectively.

Fifty percent of the students enrolled in the class (100% of those in attendance the day the questionnaire was administered) completed the questionnaire. Responses were dichotomized into strongly satisfied/satisfied and

Table 2. Association Between Faculty Assessment of Student Learning Outcomes and Student Satisfaction With Achievement of Those Outcomes

Student Learning Outcomes	Student Grade, % (N=74)^a	Student Satisfaction, % (N=37)^b
Describe pharmacy practice through its various aspects (Question 2)	93.2	94.6
Discuss present-day pharmacy practice and opportunities (Question 1 & 5)	94.6	94.6
Describe pharmacist's responsibilities to society (Question 3, 4 & 6)	96.0	97.0

^a Percent of students who scored $\geq 70\%$ on project dimensions of performance (direct assessment).

^b Percent of students who were strongly satisfied/satisfied with the extent the SLOs of this part were met.

dissatisfied/strongly dissatisfied, however, only the strongly satisfied/satisfied are reported in Table 2. The results of this indirect assessment showed that students were strongly satisfied with the level to which all 3 learning outcomes

were covered in the course content, with an average ranging from 94.6% and 97.3%.

Table 3 shows that the mean grade of faculty members and peers on various dimensions of the presentation were almost the same. The students were able to provide an informative presentation (faculty 85.8% vs. peer 85.2%), which was delivered clearly and smoothly (faculty 81.8% vs. peer 86%) and were able to answer questions appropriately (faculty 84.4% vs. peer 84.2%). The oral presentations were well organized (faculty 87.4% vs. peer 86.4%) and with clear content (faculty 87.8% vs. peer 86%). The comparison between the averages of the faculty member and peer evaluations showed no significant difference for all.

In order to determine the general student perception of the career assignment, data from questionnaire B were summarized in Table 4, after dichotomizing the answers to strongly satisfied/satisfied and dissatisfied/strongly dissatisfied. The response rate was 77 % of the students registered in the class (100% of those who attended the session in which the questionnaire was administered). The results showed a favorable overall response of 83.1%. Students found this assignment challenging and extremely

Table 3. Oral Presentation Summary Results Showing Comparison of Faculty Evaluation Results and Overall Peer Evaluation Results

Dimension	Faculty Evaluation			Peer Evaluation			P
	Mean (SD)	Average Grade, %	Confidence Interval (95%)	Mean (SD)	Average Grade, %	Confidence Interval (95%)	
Part I: Delivery of Presentation							
Organization	4.4 (0.6)	87.4	[4.2 - 4.5]	4.3 (0.5)	86.4	[4.2 - 4.4]	0.3
Well-prepared (not reading)	4.4 (0.6)	87.2	[4.2 - 4.5]	4.3 (0.5)	85.6	[4.2 - 4.4]	0.6
Clear content	4.4 (0.6)	87.8	[4.3 - 4.5]	4.3 (0.5)	86.0	[4.2 - 4.4]	0.2
Part I Grade summary (5%)	4.4 (0.6)	87.4	[4.3 - 4.5]	4.3 (0.5)	86.0	[4.2 - 4.4]	0.3
Part II: Presentation & Communication Skills							
Confidence is apparent	4.3 (0.6)	86.0	[4.2 - 4.4]	4.3 (0.4)	85.4	[4.2 - 4.4]	0.2
Direct eye contact	4.3 (0.6)	85.0	[4.1 - 4.4]	4.3 (0.4)	85.0	[4.2 - 4.4]	0.3
Proper rate of speech /fluent	4.2 (0.5)	83.0	[4.0 - 4.3]	4.2 (0.4)	83.6	[4.1 - 4.3]	0.2
Appropriate pitch of voice/ use of pauses	4.1 (0.6)	82.2	[4.0 - 4.2]	4.2 (0.4)	83.2	[4.1 - 4.3]	0.8
Absence of obvious nervousness (trembling voice; restless movements)	4.1 (0.5)	81.4	[4.0 - 4.2]	4.2 (0.4)	83.2	[4.1 - 4.3]	0.6
Professional phraseology	4.2 (0.5)	84.4	[4.1 - 4.3]	4.2 (0.4)	83.2	[4.1 - 4.3]	0.1
Informative	4.3 (0.6)	85.8	[4.2 - 4.4]	4.3 (0.4)	85.2	[4.2 - 4.4]	0.2
Smooth delivery & clear	4.1 (0.5)	81.8	[4.0 - 4.2]	4.1 (0.4)	82.8	[4.1 - 4.2]	0.5
Appropriate responses to Q&A	4.2 (0.6)	84.4	[4.1 - 4.4]	4.2 (0.4)	84.2	[4.1 - 4.3]	0.2
Printed and audiovisual materials are accurate, clear and effective (complements what is verbally presented)	4.6 (0.5)	91.2	[4.4 - 4.7]	4.3 (0.5)	86.6	[4.2 - 4.4]	0.4
Part II Grade summary (5%)	4.2 (0.4)	84.6	[4.1 - 4.3]	4.21 (0.4)	84.2	[4.1 - 4.3]	0.3
Overall Grade (10%)	8.6 (0.9)	86.0	[8.4 - 8.9]	8.51 (0.8)	85.1	[8.3 - 8.7]	0.2

educational and therefore, they recommended keeping it. More than 50% of respondents considered literature search not an easy task.

The 4 open-ended questions in questionnaire B required students to reflect on the obstacles they faced and what the most difficult part of the assignment had been. These obstacles were mainly related to their ability to find appropriate literature describing some of the 28 pharmacy careers, find literature related to pharmacy careers in Lebanon, compare careers in Lebanon versus those described in the literature, find the right pharmacist to interview, schedule the interview, and select and coordinate the information to include in their report and presentation.

DISCUSSION

Both the direct and indirect assessment results showed that more than 93% and 94.6% of students, respectively, were able to meet the student learning outcomes by the course content. The career assignment involving presentations and discussions also had an effect on students' attitudes and approach toward the various career pathways presented. Therefore, more than 80% of students considered practicing the discussed role in the future.

The oral presentation achieved its objective by increasing awareness among students of the different career pathways available through active-learning discussions during the Q&A part of the presentation. Students commented on how their views changed with respect to certain career pathways (ie, military services, hospital pharmacy). Each presenter became the "expert" with respect to the

researched career and was able to share his/her knowledge with classmates, making it an educational experience for all. This assignment can be paralleled to that described in a study by Whitley,¹⁸ who developed and integrated a student-centered, active-learning public health discussion to enhance knowledge and encourage integration of public health activities into students' future careers.

Because there was no examination related to this assignment and its content, the peer evaluations were considered an objective alternative identifying how informative and useful each presentation was. Furthermore, students were able to comfortably evaluate their peers with the knowledge that their evaluations were anonymous, not shared by their classmates, and not part of any course grade.

The impact of the career assignment on students in our study was parallel to that reported in other published studies. A study by Baia and colleagues¹⁹ found that 40% of pharmacy students who completed an elective in academia considered academic pharmacy as a career. Similarly, an elective advanced pharmacy practice experience in sports pharmacy provided students with insight into the various roles of pharmacists in sports pharmacy.²⁰ In our study, students strongly agreed that the assignment added to their knowledge (96.4%) and that the whole experience was educational (100%).

Colleges and schools of pharmacy should focus on preparing pharmacy graduates for emerging career opportunities in addition to implementing teaching and assessment strategies for effective and efficient student learning at the graduate level.²¹ Future pharmacists should

Table 4. Student Perception of the Career Assignment (N=57)

Assessment Statements	Strongly Agree/Agree, %	Disagree/ Strongly Disagree, %	Not Answered, %
I was aware of the role I am researching	86.0	14.0	0
Finding the required information was a beneficial experience	96.5	3.5	0
Searching the literature was an easy task	45.6	54.4	0
The interview was a smooth process	70.2	26.3	3.5
Gathering information was a challenging task	93.0	7.0	0
The interview was helpful in preparing for the role	86.0	12.3	1.7
I would consider practicing the discussed role in the future	84.2	15.8	0
I was satisfied with the overall experience	89.5	10.5	0
I received guidance/support from faculty when preparing for the assignment	70.2	26.3	3.5
I would recommend keeping the assignment	82.5	17.5	0
The grade distribution for the assignment is adequate	80.7	14.0	5.3
The assignment added to your knowledge	96.5	3.5	0
Overall the whole experience was educational	100	0	0
I would recommend this experience to a colleague	82.5	17.5	0
Overall (Average)	83.1	15.9	1.0

be prepared to meet the diverse career opportunities that became part of their community in order to meet the increased responsibility and expectations of each career. An editorial by Victor emphasized the importance of pharmacists as highly trained professionals and highlighted how they were underused.²² This situation is changing, particularly as the public and other health care providers better understand the increasingly diverse skills that pharmacists can master/acquire, such as in criminal justice.²³

As confirmed in our study, some pharmacy careers are not practiced in Lebanon, which created a limitation for some students' ability to schedule an interview and obtain a complete job description for some careers, yet it was considered an educational experience. Students who had difficulty with any part of the assignment received the necessary guidance from the faculty member to meet the intended objectives. The assignment provided students with additional learning opportunities such as to engage in Q&A discussions with classmates, which reinforced students' communication skills; to provide feedback to their peers on each career pathway presentation, although their feedback did not count towards the presenter's grade; to develop their leadership skills through the interview component of the assignment²⁴; and to learn time management skills to complete various requirements throughout the assignment (schedule the interview, give the oral presentation, conduct the Q&A session).

The small number of students enrolled in this course may be considered a limitation, however, it represented all P1 students and thus, future assessment may overcome such drawback by comparing future classes with this study. The administration of the questionnaires at different times was intended to assess the perception of the assignment at the end of the Pharmacy Practice part, yet the student learning objectives had to be administered at the end of the semester for both parts of the course concurrently. Questionnaire B had a better response rate because of better student attendance on the day the questionnaire was administered, as it was only week 5 of the semester. Whereas on the day that Questionnaire A was administered, attendance was low as it was the last day of classes and some students decided to skip the class in order to prepare for their finals. The questionnaires were given without informing students ahead of time and doing so may have improved the response rate.

For future offering of the course, involved faculty plan to provide a general list of references and citations to students that contain the basic information about careers in pharmacy to ensure that students are using appropriate references. Also, faculty members will contact pharmacists prior to the course and create a list of those willing to participate in the assignment. This will simplify

the process of students identifying and scheduling interviews with qualified pharmacists. Finally, faculty members will provide students with the top 3 examples of students' work from previous years to illustrate the objectives for the assignment.

Additionally, colleges and schools of pharmacy should consider including career options as part of their orientation for their students upon enrollment as well as upon graduation. The schools also should address the following options within the curriculum as part of the pharmacy practice course, allowing students to learn more about each career pathway: field trips, retreats, a seminar course that invites speakers practicing nontraditional pharmacy careers, or an elective course on career pathways. Furthermore, graduate degrees and programs should be offered to foster expanded pathways for pharmacists.

More should be written in the literature addressing pharmacist's qualifications, job description/ duties, reporting system, and site of practice, for each career addressed. Concerned professional organizations should maximize postgraduate training opportunities to accommodate the demands of the community. Professional pharmacy organizations and associations should be encouraged to display and post on their Web site information and opportunities on all career options available and specify qualifications for interested applicants. The governmental agencies or pharmacy boards, should also list all practiced career options in their respective country/state.²⁵

CONCLUSION

A career exploration assignment and oral presentation provided students with a unique opportunity to widen their knowledge and understanding of the different career pathways that are available in the profession. The direct and indirect assessment tools used in this study, including faculty-graded rubric questions, peer evaluations, students satisfaction and perception, demonstrated that the assignment met the study's objective.

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Appendix 1. List of Pharmacy Career Pathways describing the “Role of pharmacist”.

Clinical care¹
Academic pharmacy and other health care professions²⁻⁴
Community care^{1,5}
Complementary and alternative medicine⁶
Cosmetics
Drug information center¹
Environmental health and green movement⁵
Hospital care¹
Illicit drugs addiction⁷
Importation / exportation and distribution of pharmaceutical products³
Informatics and information technology^{5,2}
Intoxication - poison prevention center³
Laboratory³
Managed care pharmacy^{5,7}
Medication safety⁸
Military services¹
Nuclear pharmacy¹
Nutritional support/ nutrition⁴
Pharmaceutical marketing³
Pharmaceutical industry & quality assurance^{1,5,9}
Pharmacogenomics²
Professional organizations¹
Public health^{1,10}
Regulatory agencies and governmental structure, policy making and advocacy^{1,5}
Research based careers^{1,11}
Sports pharmacy¹²
Pharmaceutical industry & quality assurance^{1,5,9}
Third party payers¹³
Veterinary pharmacy¹⁴

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