

## BAU Pharmacy Students' Perception on their Online Learning Experience: A Cross-Sectional Study

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### Abstract

*Background:* The COVID-19 pandemic imposed dramatic changes on educational practices worldwide. Many universities and schools have moved into the delivery of their courses and educational programs utilizing fully electronic online modes. This study aims to evaluate the pharmacy students' online learning experience during the COVID-19 pandemic in the faculty of pharmacy at Beirut Arab University (BAU) to guide the pharmacy curriculum development.

*Methods:* A cross-sectional survey was developed and distributed to students at the end of the spring semester of 2022. The survey was anonymous and participation was voluntary. The survey consists of 31 questions and each is a 5-point Likert scale. The answers made up a score that reflects the student's online learning experience in 5 main domains. The data were collected and recorded via google forms. Then the retrieved data was analyzed using SPSS version 25.

*Results:* The response rate was 80% (n = 375). About two third of the respondents were female students (n=262). The majority of pharmacy students preferred on-campus learning (72.53%) whilst online learning negatively affected their interaction with instructors and colleagues (64.80%). Moreover, most of the students reported that online exams were more stressful and less fair than on-campus exams (60.27% and 56.26% respectively). The majority of students reported the effectiveness and the high quality of the online learning system in BAU (64% and 65.86% respectively). Online learning was positively reported by students for improving their research application skills (72.80%), and accessibility for those residing in rural areas (50.14%). ANOVA test followed by post hoc analysis showed a significant difference in Moodle and Microsoft Teams use as educational platforms as well as online exam fairness among the various levels of pharmacy students.

*Conclusion:* The online learning experience presented opportunities and posed challenges during the COVID pandemic. Carefully designed curriculum adopting blended learning can better respond to students' needs and concerns while ensuring their full engagement.

**Keywords:** COVID-19, pharmacy, online learning, experience.

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## **Introduction**

Online education, an approach to acquiring knowledge and skills, differs from the conventional classroom setup by utilizing the internet as its platform. It was first introduced in the 1990s and was particularly prevalent in higher education (1,2).

Many universities offered online degree programs, allowing students to earn their degrees entirely online with the same curriculum and requirements as their on-campus counterparts(3,4).

The evolution of online education has given rise to a range of several types, each with its features and benefits. Among the various types is the fully online courses, which are conducted entirely online, without any on-campus (face-to-face) meetings (5). In such learning method, students can access the course materials, lectures, and assignments through an online learning platform (6,7). Another type is the blended courses that combine online instruction with on-campus classes or activities. Students may attend some classes or labs on-campus while completing other components of the course online. On the other hand, the hybrid type includes two groups of students attending the courses online and on-campus simultaneously (8,9). Virtual classrooms; a prominent type of online learning can simulate traditional classrooms through video conferencing software, allowing students and instructors to interact in real time. Students can attend lectures, participate in discussions, and collaborate with classmates online (10,11).

One of the most notable benefits of online education is its flexibility. Students can access course materials and complete assignments at their own pace and choose the best time for studying. This is especially beneficial for individuals with busy schedules, such as working professionals or parents, who can balance their education with other responsibilities (12). Another positive feature is accessibility since online education allows students to access learning materials from anywhere in the world, as long as they have an internet connection. This is particularly advantageous for individuals living in remote areas or those with physical disabilities who may have difficulty traveling to a physical campus (13).

Moreover, online education is a cost-effective method. It is more affordable than traditional education since it eliminates expenses such as commuting, housing, and on-campus living costs. Additionally, many online courses and resources are available for free or at a lower cost compared to traditional textbooks (14,15).

However, in order to achieve the optimum outcomes from online education, students must be actively engaged in the learning process. Online education lacks the face-to-face interaction and socialization that traditional classrooms offer. In addition, some fields of study, such as healthcare or engineering, require hands-on training and practical experience in which online education may not be able to provide the same level of hands-on learning opportunities as traditional education (16). Besides, online education requires students to be self-disciplined and motivated to stay on track with their coursework. Without the structure and accountability of a physical classroom, some students may struggle to stay motivated and may procrastinate in their studies(17). Furthermore, technical difficulties can hinder the learning experience. Issues such as quality of internet connectivity, software glitches, or hardware malfunctions can disrupt access to course materials and affect the overall learning process (18).

The COVID-19 pandemic has led to a significant disruption in traditional education systems around the world, with a compulsory shift to online education. With the lockdown and closure of schools and universities to limit the spread of the virus, online learning became the primary mode of education. During this period, online education platforms such as Zoom, Microsoft Teams, Moodle, and others played a vital role in facilitating virtual classrooms (19,20).

In response to the COVID pandemic, the faculty of pharmacy at BAU, which is accredited by the Canadian Council for Accreditation of Pharmacy Programs (CCAPP), adopted the online education method of teaching. The well established infrastructure of BAU; including technologies, platforms, and facilities; supported the maintenance of providing quality education during the pandemic.

This study aimed to investigate the students' experience in online learning during the COVID-19 pandemic and to explore the potential to adopt online learning in the future as a teaching method besides traditional classroom learning.

## Method

### Study Design

This is an observational cross-sectional study that includes an online survey distributed to pharmacy students at BAU.

### Study setting

All pharmacy students in BAU from level one to level five were invited to voluntarily respond to the survey reflecting their online learning experience during the COVID-19 lockdown. The survey was disseminated online via Google Forms and the link to fill out the survey anonymously was given to students.

The study was conducted after the completion of the online learning experience for pharmacy students at the end of the spring semester of 2022.

### The Development of the Survey

The survey was comprehensively developed by a research team at the faculty of pharmacy at BAU. It consisted of the basic demographic section including the gender and the level of pharmacy education. In addition, the core of the survey is composed of 31 questions, each is a 5- point Likert scale (1-strongly disagree, 2- disagree, 3- neutral, 4- agree, and 5- strongly agree). The questions were distributed on 5 principal components as follows:

#### 1- The online learning preference assessment (questions 1 to 10)

The first component consists of ten questions that aim to assess various aspects of online learning, such as ease of access, comfort level with online communication and discussion, preference for online learning over on-campus learning, and the usefulness of online learning tools in understanding course materials.

#### 2- Technology, learning tools, and skills application (questions 11 to 17)

The second component of the survey is focused on technology and learning tools, and the application of skills necessary for online learning. This component consists of seven questions that assess the respondents' experiences with online platforms, tools, and resources, as well as their proficiency in using them.

#### 3- University support (questions 18 to 21)

The third component of the survey is focused on the support provided by the university for online learning. This component consists of four questions that assess the respondents' perception of the effectiveness and quality of the university's online learning system and the level of support provided by the university's IT department.

#### 4- On-campus learning preference assessment (questions 22 to 27)

The fourth component of the survey is focused on the respondents' preferences for on-campus learning and their perceptions of the differences between on-campus and online learning. This component consists of six questions that assess the respondents' attitudes

towards the value of on-campus learning, the integration of online learning with on-campus sessions, the level of concentration in online lectures compared to on-campus lectures, the quality of interaction with instructors, the impact of online learning on social relations and activities, and the responsiveness of instructors in on-campus exams compared to online exams.

#### 5- Online examinations assessment (questions 28 to 31)

The fifth component of the survey is focused on the respondents' perceptions of online examinations. This component consists of four questions that assess the respondents' attitudes towards the stress level, focus and concentration, attendance, and fairness of online exams compared to on-campus exams.

#### Survey Revision and Pilot Testing

The survey was reviewed for language and content validity by experts in the field of education in the faculty of pharmacy. They were asked to assess the clarity, comprehensiveness, and structure of the constructed survey. Then, the survey was piloted on pharmacy students chosen randomly who were not included in the study. They were asked to evaluate the structure, length, clarity, organization, and overall evaluation of the survey. They approved the content of the survey as it is and reflected a positive impression of the survey. Hence, the survey was distributed on a large scale to all students in the faculty.

#### Data Analysis

After responding to the survey via Google Forms, the collected data were retrieved into Excel sheets. Then the data were screened for completeness and coded accordingly. Later, the data were imported to the 25th version of Statistical Package for the Social Science (SPSS, IBM Corp., USA) to perform the statistical analysis. Descriptive data were presented using frequencies and percentages as well as the mean and standard deviation for qualitative and quantitative variables respectively. Student t-test and ANOVA were used to compare scores among genders and pharmacy education levels. A p-value less than 0.05 was considered significant with a confidence interval of 95%. Moreover, the reliability of the survey questions was also tested by Cronbach's Alpha coefficient such that a value between 0.6 and 0.9 is considered acceptable (21)

#### Ethical Approval

The study was approved by the Institutional Review Board of Beirut Arab University (2023-H-0085-P-R-0519)

## **Results**

The response rate was 80% (n = 375). About two third of the respondents were female students (n=262). The highest response was observed among the 1st level pharmacy students (28.27%). The distribution of respondents among the levels of undergraduate pharmacy students is illustrated in Figure 1.

Distribution of Respondents among the Levels of Undergraduste Pharmacy Program

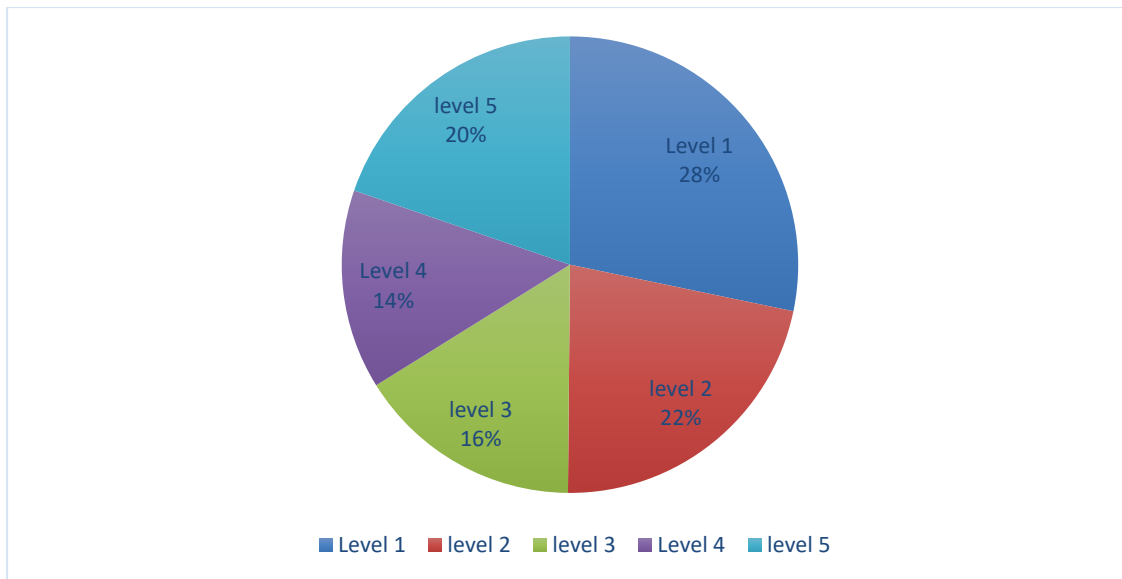


Figure 1: The distribution of respondents among the levels of undergraduate pharmacy program students

The survey results showed that the majority of Pharmacy students preferred on-campus learning as it provides better interaction with instructors and colleagues (72.53%) whilst online learning had a negative impact on social relations and activities (64.80%). Hence, a minority of students (22.40%) preferred online learning. The preference for online learning was attributed to logistic considerations where remote students can easily attend their lectures in their area of residence (50.14%). Moreover, many students reported that online courses helped them manage their reading and homework time (46.40%) and monitor their academic progress (57.60%). However, the highest percentage of students revealed having the essential tools needed for online learning (86.4%) as well as the skills to post assignments (85.33%). They also reflected that online learning experience improved their knowledge and research application skills where they could retrieve the required information from online resources (72.80%) and access several online learning materials such as E-books and databases (72.53%). Nevertheless, most of the students reported that online exams were more stressful than those on campus (60.27%), did not allow students to focus on questions (50.40%), and they were not as fair as the on-campus exams (56.26%).

Concerning university support, a vast percentage of students declared that BAU has an effective online learning system (64%) and it delivers a good quality online learning experience (65.86%). The full questionnaire and students' responses to each question are demonstrated in the appendix. The reliability of the questionnaire was measured by Cronbach's Alpha which was 0.809 indicating high reliability.

Student t-test was performed to compare the responses of male and female students to each question and they were all non-significant indicating that gender was not affecting the responses to the questionnaire. Moreover, the ANOVA test to compare the responses of the five pharmacy levels was conducted and significant differences in some questions were observed as presented in Table 1.

Table 1: ANOVA test significant results comparing the responses of undergraduate pharmacy students to the questionnaire items among the five levels

Questions	p-value
Moodle platform is user friendly	.003
Microsoft Teams platform is user friendly	.000

Online learning sessions are delivered according to the announced/agreed-upon schedule	.000
Online exams are fairer than on-campus exams	.002

Bonferroni post hoc analysis was conducted further to identify the pharmacy levels among which a significant variation in responses was present. The results are further illustrated in Table 2. The results showed that the main difference was in the following domains: technology-learning tools- and skills application, university support, and online examination assessment. the use of Moodle as a learning platform was preferable for 2<sup>nd</sup> and 3<sup>rd</sup>-level students compared to 1<sup>st</sup>-level students, whereas Microsoft Teams was more favorable for 1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup>-level students than those in 4<sup>th</sup> and 5<sup>th</sup> levels. Moreover, 1<sup>st</sup>, 3<sup>rd</sup>, and 4<sup>th</sup> level students agreed that online learning sessions were delivered according to the announced schedule more than 5<sup>th</sup> level students. Finally, the results revealed that 1<sup>st</sup>-level students favored online assessment over on-campus examinations compared with 2<sup>nd</sup>, 3<sup>rd</sup>, and 4<sup>th</sup>-level students.

Table 2: Bonferroni post hoc analysis for questions showing significant differences in response among the various Pharmacy students' levels

Dependent Variable	(I) level	(J) level	Mean Difference (I-J)	Std. Error	p-value	95% Confidence Interval	
						Lower Bound	Upper Bound
Moodle platform is user friendly	1	2	-.306	.105	.040	-.60	-.01
		3	-.406	.116	.005	-.73	-.08
Microsoft Teams platform is user friendly	1	4	.481	.157	.023	.04	.92
		5	.510	.141	.003	.11	.91
	2	4	.636	.164	.001	.17	1.10
		5	.665	.149	.000	.24	1.09
	3	4	.727	.176	.000	.23	1.22
		5	.756	.162	.000	.30	1.21
Online learning sessions are delivered according to the announced/agreed-upon schedule	1	5	.937	.168	.000	.46	1.41
		3	.896	.192	.000	.35	1.44
	4	.588	.199	.033	.03	1.15	
	5	1	-.937	.168	.000	-1.41	-.46
		3	-.896	.192	.000	-1.44	-.35
	4	-.588	.199	.033	-1.15	-.03	
Online exams are fairer than on-campus exams	1	2	.481	.163	.034	.02	.94
		3	.589	.180	.011	.08	1.10

4	.538	.187	.043	.01	1.07
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## Discussion

The study showed that pharmacy students at BAU reflected on their online learning experience by reporting their preference for on-campus learning. The majority of the students also reported the high quality of BAU online learning and technical support.

The findings of our study were similar to previous studies where on-campus learning was highly preferred to online learning and addressed the negative impact of online learning such as inadequate interaction with lecturers and colleagues and inability to apply their knowledge and skills in practical sessions and clinical training (22–24). Moreover, the instability of the internet connection was a major obstacle hindering students to maximize their benefits from the online learning experience (25,26). Nevertheless, online learning had positive aspects which made it favorable for many students. These findings were reported in various studies where students demonstrated that online learning helped them to develop their time management, reading, and research skills. Besides, online learning enables the students to set their own learning pace, and there's the added flexibility of setting a schedule that fits their agenda. It also improves accessibility to students residing in distant areas to join their colleagues in their sessions which is time and cost-saving (24,25,27–29).

When comparing the results among pharmacy students in the five levels, the main significant difference in response was in the use of the learning platforms adopted by the faculty of Pharmacy at BAU such as Moodle and Microsoft Teams. Notably, 1<sup>st</sup>-level students significantly disapproved of the use of Moodle compared to students in 2<sup>nd</sup> and 3<sup>rd</sup> levels. This can be explained by the fact that junior students were not familiar with the use of Moodle whereas students at higher levels received thorough training on this platform making it more applicable. However, Microsoft Teams was significantly more favorable for 1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> level students compared to 4<sup>th</sup> and 5<sup>th</sup> level. This can be attributed to the adaptation of this platform in high school and the widespread of its use making it more familiar for students who were adopting the online learning experience.

In this context, senior students also disagreed on the delivery of online sessions according to the announced schedule compared with students at earlier levels. This is principally related to their lack of previous experience with online learning platforms and the nature of their courses in the 5<sup>th</sup> year which were mainly experiential learning and several elective courses delivered by various instructors.

Finally, and in accordance with the previous results, 1<sup>st</sup> level students were significantly satisfied with online exams as an assessment method since it was the method used in their high school learning and it is less stressful for them in time and supervision with strict proctors which are mainly present during on-campus examinations.

## Limitations:

The study was cross-sectional in which students-related variables were not fully addressed and accordingly, the association between the learning methodology preference and students-related factors could not be estimated. Moreover, because of the observational type of study, a causality relationship can not be concluded from the findings.

## Conclusion:

Pharmacy students revealed a high preference for the on-campus learning and highlighted the positive aspects of online learning during their experience. Based on these findings, exploiting the advantages of online education with the previously well-developed traditional on-campus learning can optimize the student's learning experience in the faculty of pharmacy. A carefully designed blended learning system can better respond to students' educational needs and concerns while ensuring their full engagement. The survey results are expected to impact the design of our future curriculum through the emphasis of incorporating online teaching methodologies in both the delivery and assessment of most courses offered by the Faculty of Pharmacy at BAU.

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