

Online Learning Evaluation of Drug Information Service Lectures in The Faculty of Pharmacy, Sanata Dharma University

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ABSTRACT

The COVID-19 pandemic impacted the need for new adaptations in the learning process, namely by implementing an online learning system. This method remains a trend in the future, so it is necessary to conduct research to evaluate the online lectures. The evaluation process evaluates at the microlevel, namely the process, learning outcomes, and student perceptions of the Drug Information Services course. This research is evaluative and descriptive, with a *cross-sectional* design and quantitative and qualitative approaches. Research was conducted at the Faculty of Pharmacy, Sanata Dharma University. The respondents were 124 USD Pharmacy undergraduate students who took the Drug Information Services course in the odd semester of 2020–2021. Student learning outcomes and perceptions were obtained using validated assessment rubrics and reflection questionnaires. The results showed that the implementation of Drug Information Services lectures went according to the semester learning plan; there were minor revisions to improve the dynamics of student discussions. Students learning outcomes are in the "very good" category, except for the OSCE examination, which is relatively sufficient. Student have a positive perception of this online lecture. In conclusion, this online lecture can be maintained for the future with a slight modification to the oral exam, which uses the offline method by implementing strict health protocols.

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1. Introduction

The COVID-19 pandemic was officially announced by the Government of Indonesia on March 11, 2020, followed by the Work From Home policy. This regulation also applies to universities in Indonesia, so new adaptations are needed in the learning process, namely online learning systems. Online learning is more dominant in improving students' knowledge but less able to improve their skills and professional practice (Salter et al., 2014). The evaluation of online learning in Malaysia found that students are happy and satisfied with online learning. Half of the students stated that online learning can increase self-confidence but is time-consuming (Lean et al., 2018). The Drug Information Service course in the last three semesters has used authentic assessment to assess student performance during learning. This lecture's assessment obtains from college scores (assignments, performance, and written exams) and practicum (OSCE exams).

According to several studies, authentic assessment has provided benefits in (1) providing student experience in real-world situations, (2) thinking critically from various sides and doing problem-solving (Peeters et al., 2016) and (3) integrating knowledge, skills, and attitudes to obtain a deep learning experience (Gandhi, 2002; Santos, 2017). During this pandemic, the OSCE exam can no



longer conduct offline but online, so an adaptation process is needed in the learning process. The Drug Information Services course was chosen because Drug Information Services is one of the basics for prospective pharmacists to practice clinical pharmacy. The adaptation process from offline learning to online is also a momentum for improving Drug Information Services lectures carried out in the Semester Learning Plan written in blended learning and the online exam process.

The Semester Learning Plan and OSCE exam implemented in the odd semester of 2020/2021 have been validated by experts. Limited trials were conducted in June–July 2020. The aim of this study is to evaluate the implementation of online learning for Drug Information Services lectures in the undergraduate study program, and also as an evaluation material for the study program regarding the achievement of learning outcomes of the PIO course and student satisfaction during the pandemic. The evaluation was based on the process, learning outcomes, and student perceptions, which have never been done in the previous period at the Faculty of Pharmacy, Sanata Dharma University.

2. Materials and Methods

This research is descriptive-evaluative with a cross-sectional design and quantitative and qualitative approaches. This study evaluates learning at the micro level (Achteimer et al., 2019) to assess the process, learning outcomes, and student perceptions of lectures. The study was conducted at the Faculty of Pharmacy, Sanata Dharma University. The respondents were undergraduate pharmacy students of The Sanata Dharma University who took Drug Information Services courses in the odd semester of 2020–2021, totaling 124 students. Data collection and analysis are as follows:

The data of the learning process is the authentic description of the course obtained from learning by lecturers, which is analyzed descriptively. For classroom learning, each course learning achievement is made in two meetings so that lecturers can provide theory and discuss with students. The practicum learning is done entirely online. The total material is six and ends with a practicum exam in an Objective Structured Clinical Examination (OSCE) format.

Learning outcome data is the student's oral and written test scores which are analyzed quantitatively, followed by statistical tests (unpaired t-test). Assessment of students' outcomes evaluates by two methods, namely written and oral examinations. For written exams: (1) group assignments in critical appraisal material and preparation of standard operating procedure (SOP) of drug information service and (2) individual examinations for midterm and final exams. Then the oral examination is in the form of: (1) individual tests of student performance in conducting counseling and (2) individual tests of student performance in the OSCE exam totaling two questions about drug information services in prescription drugs and special devices.

Student perception data in the form of student reflections on online learning, which are analyzed descriptively. The validated assessment rubric and reflection questionnaire were used to collect data on student learning outcomes and perceptions. Students' perceptions are assessed based on the results of the reflections they do. Reflection did by the Ignatian Pedagogy (reflective pedagogy) for exploring experiences, obstacles, and plans for future improvement. This reflection explores students' perceptions (in group) during online drug information services lectures.

Reflection questionnaires using three questions made by researchers inspired by literature (Muilenburg & Berge, 2007). This research was funded by LPPM USD with agreement number No. 017/Penel./LPPM-USD/II/2020 and obtained ethical clearance from the Health Research Ethics Commission of Universitas Respati Yogyakarta with number 179.3/FIKES/PL/VIII/2020.

3. Results and Discussion

We must adapt learning plans designed for blended learning to online lectures. An online learning system implemented for the whole semester is a new thing to do, considering that face-to-face meetings in class still need to be allowed in 2020. This system certainly creates new experiences, flexibility, and adaptations that must make during the learning process. Online learning, carried out in full for one semester, is supported by the Learning Management System (belajar.usd.ac.id) available at the University level. The actual implementation of lectures is divided into lecture presentations followed by class discussions and flip classroom methods. For the practicum, we adjusted all material to the course learning achievements.

3.1. Learning Process

For classroom learning, after giving material, students held group discussions in the breakout room in a Zoom video conference. The initial reflection of students who showed their commitment to learning this lecture is as follows:

Class A will improve the ability to access and read journal articles quickly and accurately, then increase knowledge of drugs and communication skills.

Class B will conduct a self-evaluation of the abilities that they possess, improve their ability to read journal articles, and practice communication.

The practice of reflection by students at the beginning of the learning above is a reflection-in-action process, which will trigger the learning process so that later, students can integrate theory and practice (Tsingos et al., 2014).

In classroom learning, students practice website browsing on the internet and critical appraisal of scientific publications about drugs. Websites explored include Medscape, drug.com, Cochrane Library, PDR.net, and tripdatabase.com. The ability to access information and explore websites is currently a process of knowledge formation (Cain & Fox, 2009), which is strengthened by conducting step-by-step critical analysis of scientific articles about drugs or treatment. The ability to analyze research design, methodology, and interpretation is an essential foundation for students to think critically, learn profoundly, and update information on drug development required to carry out drug information service (Prel et al., 2009; Timm et al., 2012). These two exercises provide new perspectives for students on the importance of Evidence-Based medicine (EBM) in pharmaceutical practice. The ability to access, explore and critique the meaning of EBM is an introduction to the daily professional activities of a pharmacist in conducting drug information services (Al-Quteimat & Amer, 2016).

Lectures also train students' abilities to communicate. This individual training is crucial to increase confidence and communication skills in conducting drug information services to the community (McDonough & Bennett, 2006). Several meetings are used for students to demonstrate their ability to communicate. Students are enthusiastic about participating in this learning process, which can be seen from their thorough preparation and efforts to perform best. Based on the description of actual online learning, semester learning plan designed in blended learning can be implemented entirely through online learning.

The implementation of the practicum has been under initial planning. Website search to find EBM and exercise in critical appraisal is a process of deepening the lecture material. This process is referred to as the repetition process, where with the repetition of material in the practicum, students will get a more varied and immersive learning experience. There are guidelines for conducting a critical appraisal, triggering students to do CA critically, systematically, and logically (Young & Solomon, 2009). This ability is essential to train, given the dynamic development of drugs. This critical appraisal exercise is an essential foundation in the search for EBM to support decisions in the use of drugs in therapy (Martin et al., 2016).

In the next meeting, students worked on case studies in the patient care process (Boyce, 2017; Cooley & Lee, 2018) using the PCNE 8.01 guidelines. The purpose of providing this material is to train students' logical framework in identifying drug therapy problems. This analytical ability is essential in supporting critical thinking skills needed in future pharmaceutical practice (Peeters et al., 2016). Using the PCNE 8.01 guidelines will enable students to identify drug-related problems (DRPs) after graduating as pharmacists, thereby improving patients' quality of life (Nasution et al., 2019).

The following material is counseling about special devices to the community, which uses the project-based learning method (Hamilton et al., 2020). The pandemic condition resulted in modifications in the implementation of counseling. Students make videos on Youtube, and the audience can ask questions through the comments column. This simple practice may become a new role model in conducting PIOs in the future (Mohiuddin, 2020).

Examples of questions and answers are as follows:

(QUESTION) Permission to ask, I am Dominic Brahma, want to ask about the swinghaler. If we do not do storage according to the instructions, will there be damage to the swinghaler? If there is damage, what are the damage characteristics to the swinghaler?

(ANSWER) Hello Dominic Brahma. Thank you for the question. I will explain briefly. Swinghaler must store with storage according to the instructions, not more focused on the tool, but related to the active substance content contained in the swinghaler. If the storage is at temperatures above 30 degrees or in a humid place, the active substances contained in the drug will be degraded or damaged, so that later the drug does not work correctly. Related to how the characteristics in case of damage are, when used, the powder that comes out is not in accordance with the dose of the tool (less powder comes out) or even, when using, no powder comes out. If this happens, you can immediately consult a pharmacy. Such is the explanation. If something still needs to be clarified, you can ask again. Thanks.

3.2. Learning Outcome

The following evaluation is on student learning outcomes. Student learning outcomes are presented in Table 1.

Table 1. Student Learning Outcomes in Drug Information Service Lectures in The Odd Semester of 2020/2021

Assessment materials	Class A	Class B	Statistical test results (p value)
WRITTEN EXAM			
Critical appraisal	84.22 ± 1.52	84.09 ± 1.55	0.716
SOP Preparation	92.76 ± 4.33	93.77 ± 2.63	0.412
Midterm Exam	84.88 ± 2.46	84.73 ± 2.04	0.779
Final Exam	86.49 ± 2.04	86.94 ± 2.96	0.678
ORAL EXAM			
Dagusibu presentation	92.71 ± 4.5	93.66 ± 2.64	0.557
OSCE exam type 1	64.27 ± 16.73	67.93 ± 15.05	0.219
OSCE exam type 2	71.19 ± 17.64	73.52 ± 17.20	0.502

Written exams on critical appraisal are conducted in group and individual formats within midterm exams. Preparing the SOP of drug information service was carried out to provide provisions related to procedural knowledge to conduct drug information service, which was carried out in groups and individually. The assignment in this group aims to train in listening to other people's opinions, working together, brainstorming, and communicating (Arja et al., 2020). Providing assignments and exams in written form is an essential tool for training critical thinking, logic, and systematic, which is very important for students after they graduate to become pharmacists (Sharif & Ibrahim, 2014).

Based on the statistical test in Table 1, both written and oral exams in both classes showed insignificant results, which means students' learning processes and understanding in both classes have been carried out and received well. Thus, the Semester Learning Plan that has been prepared can become a guideline in implementing this online learning; Similarly, students can do the exam questions that have been submitted well.

Oral examination in the form of independent performance on "dagusibu" is a form of exercise to strengthen students' communication skills and confidence. This exam is an initial initiation to support students' ability to conduct drug information services and counsel patients in the future (Epp et al., 2019). Follow-up on student performance is carried out more in-depth by conducting OSCE exams for all students. This exam is essential for students to provide them with problem-solving experience in solving case studies in pharmaceutical practice (Kristina & Wijoyo, 2018). Numerically, the

results of this OSCE exam were good. However, through this exam, various student weaknesses can be explored, which are presented in Table 2.

Table 2. Student Weaknesses in OSCE Exams

Types of OSCE questions	Findings of Weakness
Type 1	PD (5.6%), PM (49.2%), KE (35.5%), SP (4.8%)
Type 2	PD (29%), PM (27.4%), KE (29%), SP (0.8%)

PD: data and information mining; PM: problem determination, EC: effective communication, SP: professional attitude

For the OSCE exam, various weaknesses find in student performance: (1) question type 1, dominant weaknesses are in PM and KE. This result shows that there is still a lack of problem-solving and communication skills from students in terms of solving problems in prescription services, (2) question type 2, weaknesses tend to be evenly distributed in PD, PM, and KE, although the presentation is smaller than question type 1. This result shows that drug services in the special device category need attention. The results of this exploration of oral exam performance weaknesses are essential information and should follow up in the future. The ability to search for information, determine problems and communicate are the three main pillars that will be the focus of improvement in improving student skills in conducting drug information services (Fejzic et al., 2016).

3.3. Student Perceptions

After completing lectures and practicums, students reflect on their learning experiences. Students form 37 groups, so reflection is more straightforward and runs more deeply. Their answer is the dominant response perceived by all members of the group.

Table 3. The Results of Student Groups Perception of Drug Information Services Lectures and Practicums

Perception Results	Number of Groups (percentage)
ONLINE LECTURE AND PRACTICUM EXPERIENCE	
Learn new things	14 (37,8%)
Provision for practice in the field	11 (29,7%)
Need to learn more	6 (16,2%)
Can follow well	3 (8,1%)
Creative and critical thinking	3 (8,1%)
OBSTACLES DURING ONLINE LECTURES AND PRACTICUM	
No constraints	9 (24.32%)
Constraints	
Internet connection	22 (59.45%)
Difficulty obtaining information	4 (10.81)
Sleepy	1 (2.7%)
Practicum work	1 (2.7%)
CRITICISMS AND SUGGESTIONS FOR FUTURE IMPROVEMENTS	
It's been good	12 (30.77%)
The OSCE exam is already very good	11 (28.2%)
Hands-on practice in the coming period	11 (28.2%)
Development of learning methods in the coming period	5 (12.82%)

The implementation of drug information service lectures is quite different from last year, where this year, there has been a complete synergy between knowledge and practice in this lecture. Drug information service learning using simulation questions that approach the actual conditions of

pharmaceutical practice makes students more active at the individual and group levels. This synergy makes students feel new things (37.8%) and is also felt to be a provision for field practice (29.7%) and makes them more creative and able to think critically (8.1 %). This result found that simulating practice in groups will give students the experience of applying knowledge, independent learning, and the ability to do problem-solving, which becomes the basis for professional practice in the future (Fejzic & Barker, 2015). Sharing this experience is encouraging information because, thus, the entire design and implementation of the semester learning plan have provided beneficial provisions for students.

The main barrier to online learning is internet connection (59.45%). The existence of concerns about this internet connection causes students to become stressed, uncomfortable, and frustrated (Muilenburg & Berge, 2007), so it can affect enthusiasm during lectures/practicums and oral examinations. There is no solution to overcome the risk of this obstacle because the internet connection is beyond the control of students. Various weaknesses in PD and PM (Table 2) may be due to this disorder. The limitation of this study is the implementation of oral examinations on OSCE, where lecturers find it difficult to assess students' expressions and professional attitudes during their performance. In the future, offline examinations can overcome this by carrying out strict health protocols.

For future improvements, what is needed is to maintain the learning process that has been carried out so far (59%). If the pandemic condition has recovered, Students hope to be able to practice directly in the community (28.2%). The input for future improvement shows that students realize that online lectures cannot fully implement drug information services but must also do in offline. Additional suggestions were also given, for improving learning methods, especially in using social media such as YouTube and making learning videos.

4. Conclusion

Based on the implementation of online learning of drug information service lectures above, the conclusions are : A slight modification in the semester learning plan was made to trigger a dynamic discussion with students; The student learning outcomes are very good, except for the OSCE oral exam. The limitation encountered is the online OSCE assessment cannot fully capture student's professional behavior. Therefore, it is recommended to conduct offline exam in the future; and Students' perceptions show that they satisfied with this online lecture process, but suggest for direct practice in the future.

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Competing Interests

The authors declare no conflict of interest.

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