

# Exploration of Mindful Learning Systems in Medical Education in the COVID-19 Pandemic Era

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## Abstract

The COVID-19 pandemic has caused changes in various areas of life, including higher education. Medical higher education has a big challenge in the era of the COVID-19 pandemic, because it has limitations in achieving the target of graduates who are experts, both in terms of material and medical practice skills. Consumers must have their needs and desires met through the company's products or services. This study explores students' assessments and expectations regarding a wise learning system, which is following the expectations of students as consumers, in medical education during the COVID-19 pandemic. The findings from exploring the student's assessment and expectations became the basis for forming a wise concept of a medical education system during the COVID-19 pandemic. This is beneficial for educators to find win-win solutions for consumers and medical education providers that are effective and ethical in the era of the COVID-19 pandemic. This qualitative research obtained the data through FGD with medical faculty students as informants and lecturers as a triangulation unit. The academic and non-academic aspects of forming mindful learning will be discussed in more detail. The results of this research can be used if educational institutions are to carry out online distance learning

Keywords: Learning Systems; Medical Education; COVID-19; Marketing Ethics; Mindful Marketing

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## 1. Introduction

2020 was the year of the COVID-19 pandemic. The pandemic has changed the habits of people all over the world, including in Indonesia, who were previously free to do activities outside the home, to do activities from home as well as online to reduce transmission of COVID-19 (Iriani & Andjarwati, 2020; Siste et al., 2020). The condition of COVID-19 pandemic has not only affected changes in people's lifestyles and the economy but has also had an effect on the higher education (university) system throughout the world (Crucho et al., 2020; Hussain et al., 2021).

To prevent the spread of COVID-19, various universities must implement e-learning, namely online learning. This is a new challenge for students and education staff to adopt a new learning system that uses digital technology. E-learning is technology-based learning which consists of learning methods through internet technology such as video conferencing, satellite broadcasts, Google Classroom, and Google Meet, use

of online video applications such as Zoom meetings to deliver lecture material (Chopra et al., 2019). The application of e-learning occurs in all disciplines at various universities, in the fields of exact sciences (majors in medicine and engineering and social humanities (economics, law, psychology, etc.).

It becomes a challenge when using e-learning in learning for health majors such as general medical, dental, and surgical education. As we know, majoring in medicine requires practical skills (Anwar et al., 2020). Medicine is based on applying basic science, which involves carrying out clinical procedures that require direct field practice in hospitals and meeting with patients to gain ideal practice skills (Sani et al., 2020). The existence of the COVID-19 outbreak is a challenge for medical and health education to be able to provide ideal skills. The condition of COVID-19 resulted in limited teaching, namely not being able to provide clinical skills teaching directly and being able to provide practical simulations remotely (Vazquez et al., 2020).

All universities in various countries, including the UK, several countries in Europe, Africa, and America as well as Indonesia, implement e-learning, including universities that teach health education, be it general medicine, dentistry, surgery, and anesthesia (Mpungose, 2020; Rosa et al., 2020). In London, the implementation is done by creating virtual groups of lecturers and students to discuss cases online by conducting real-time videos with patients (Sani et al., 2020).

However, the application of e-learning in health education has drawn dissatisfaction from students, as customers of universities that provide educational services. Megaloikonomos research (2020) reports that 58.2% of students feel that using e-learning reduces the formation of surgeon competence. They are also concerned about achieving hand skills in their surgeon's field with e-learning. Student participants in the survey also said they believed they would not gain the ideal surgeon's practical skills using e-learning. This is also supported by research conducted by Almulhim et al. (2020) which shows that 76.9% of students believe that e-learning harms their practical skills as future health professionals, so they feel dissatisfied with e-learning. Other research (Ningsih, 2020) also shows that 93.5% of students prefer offline learning to e-learning. Similar research also states that students feel that e-learning is not able to maximize learning, and results in a lack of understanding of courses (Fatmawati, 2020). Based on these studies, it can be said that students, as customers from universities that provide educational services, are dissatisfied with e-learning and are worried about the skills of their health professionals. However, COVID-19 is very dangerous because the virus spreads quickly and is difficult to control. So based on government regulations, choosing an e-learning system is inevitable.

Universities as education service providers and learning implementers cannot ignore this condition. Success in learning in the pandemic era will create student satisfaction and create a university brand image (Hussain et al., 2021). There needs to be a proper solution in a dilemma like this. Universities are required to provide learning satisfaction for students but are also faced with the limitations of face-to-face learning. Efforts to improve temporary or permanent schools must be carried out not only for the condition of the University but also for students and teachers (Kraft et al., 2021).

Answering this dilemma, Hagenbuch and Mgrdichian (2019) explain the concept of mindful marketing. Mindful marketing is a combination concept of effective and ethical marketing. The American Marketing Association (AMA) advises that marketers need to "not only serve [their] organizations but also act as stewards of society" (AMA, 2017). In mindful marketing, considering customers' interests (market orientation) and quality will result in sustainable profits. (Malhotra et al., 2012). Mindful marketing considers business and social opportunities by producing a win-win solution (Sheth et al., 2011). In mindful marketing,

marketers must also consider the aspect of fairness, namely applying the principle of fairness to customers, meaning that marketers do not only seek profit for themselves but also provide products that match the needs and desires of customers so that customers are satisfied and feel treated fairly by the company (Hagenbuch & Mgrdichian, 2019). Thus, universities must consider the impact of e-learning in terms of social aspects, fairness, customers, and stakeholders (students, curriculum and educators, and users of health services).

With customers dissatisfied with e-learning, universities need to know student expectations, so a mindful educational learning formula is formed during the COVID-19 pandemic. Therefore, student exploration is needed to discover expectations for health education in higher education so that an idea or concept is formed regarding a mindful education system in medical education during the COVID-19 pandemic. The application of mindful learning will satisfy students so that it has an effect on e-WOM which is beneficial for the university's brand image (Nelson Oly Ndubisi, 2014).

Research that focuses on exploring the assessment and expectations of medical students regarding e-learning during the COVID-19 pandemic and the concept of mindful health education learning during the COVID-19 pandemic is still rare. Several studies discussing student assessment related to the implementation of health education in the era of the COVID-19 pandemic include Rodrigues et al. (2022) and Zarcone and Saverino (2022) which discuss student perceptions regarding the difficulties and benefits of online learning. This research is a quantitative study that does not explore in depth the expectations of online learning. Research Azzolini et al. (2022) discussed online courses and their impact on teacher retention. Research by Williams et al. (2022) discussed heterogeneity in mathematics learning. Research Karim et al. (2022) studied health students' responses to e-learning and focused on the impact on students' mental health with e-learning. Likewise, Megaloikonomos research (2020), Almulhim et al. (2020), Ningsih (2020), and Fatmawati (2020) conducted a survey regarding student assessments regarding the implementation of online lectures but did not go into detail about student assessments and their expectations regarding online lectures and did not discuss the concept of wise learning (mindful learning) in the era of the COVID-19 pandemic. Universities need to know the assessments and expectations of students so they can make wise learning concepts in health education during the COVID-19 pandemic era. The wise learning system is expected to make the implementation of education effective (achieve learning outcomes), ethical, and satisfy students. To fill this gap, this research explores the assessments and expectations of students and lecturers regarding the implementation of e-learning in medical education during the COVID-19 pandemic era so that it can help universities create wise learning concepts that can satisfy customers (students) and produce graduates with competence which are expected. To fill this gap, there are two research questions, namely:

RQ1: What are the assessments and expectations of medical students regarding learning in the era of the COVID-19 pandemic

RQ2. What is the concept of a mindful learning system in medical education during the COVID-19 pandemic

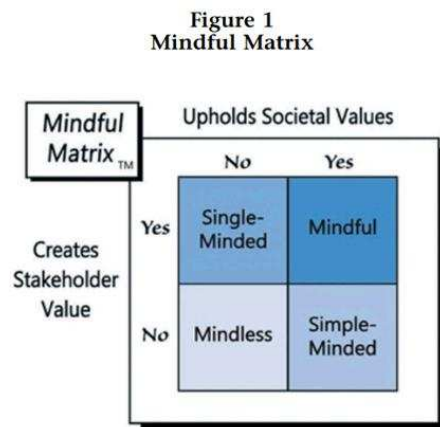
## 2. Literature

### 2.1 Mindful Marketing

Mindful marketing is marketing that does not only consider aspects of effectiveness (interests of stakeholders) but also pays attention to the social aspects of marketing activities (Hagenbuch & Mgrdichian, 2019). The mindful marketing matrix can be seen in Figure 1.

Mindful Matrix adopts the BCG Portfolio Matrix by categorizing its quadrants as 1) Mindful: effective and ethical, 2) Single-Minded: effective but not ethical, 3) Simple-Minded: ethical but ineffective, 4) Mindless: neither effective nor ethical. Ideally, companies in the mindful quadrant are effective and ethical in marketing (Malhotra et al., 2012). The existing application of mindful marketing is considered to be beneficial for the sustainability of the company and can provide customer satisfaction and loyalty that can outperform competitors (Ndubisi, 2014).

In Figure 1, the vertical line (Y axis) explains how to create stakeholder value which explains aspects of effectiveness in marketing. Marketing effectiveness explains how products can influence and meet consumer needs and achieve organizational goals, as well as provide mutually beneficial exchange facilities between consumers and companies. Meanwhile, the horizontal line (X-axis) describes upholding social values. Upholds Societal values explain ethics in marketing where marketing activities must have aspects of decency (moral), fairness, honesty, respect, and serve as well as possible. So in the context of education, a mindful learning system is an education system that considers aspects of learning achievement (university targets) and aspects of decency, fairness, honesty, and respect for education for students as a market from the university and provides the best possible service to the market.



**Figure 1.** Mindful Matrix

## 2.2 Medical Education

The Health Education System including the education curriculum must address various issues ranging from the core knowledge, skills, and attitudes expected of students upon graduation, assessment systems, and arrangements to ensure patient health and safety (Grant, 2018). Based on the American Association of Medical Colleges in Manthey et al., (2010), the general competency output of Health Education is that students can:

- (1). Patient care, namely under the direct supervision of the faculty, students must be given primary responsibility for patient care (non-critical patients) and begin to act independently during learning so that they can develop critical thinking skills, and assess their knowledge and skills in treating patients.
- (2). Medical knowledge, that is, students know medicine and can make diagnoses about patient illnesses,
- (3). Practice-based Learning and Improvement, where students can carry out practical skills in treating patients, teaching students, or health care for patients in a professional manner which can be done through learning.
- (4). Interpersonal and Communication Skills, namely students can perform interpersonal and communication skills that result in the exchange of information and effective interaction with patients, family members, and health care providers.
- (5). Professionalism, namely students have professionalism in work, implement a code of ethics as doctors, and be responsible.

The COVID-19 pandemic forced higher education which was initially delivered in person (offline) to be delivered online (Rodrigues et al., 2022). There is a change in the education system that takes years, but due to the COVID-19 pandemic, changes must suddenly be made by conducting medical education online without considering the readiness of lecturers (Rose, 2020). Medical studies need practical skills in interacting directly with patients. COVID-19 forces us not to interact directly with patients and to switch to online lectures. The online teaching process is carried out asynchronously and synchronously. Asynchronous teaching provides lecture recordings or podcasts of lecture material that students can access in their free time and can access, and study flexibly. Synchronous teaching is teaching by providing teaching sessions in real-time at the same time that encourages interaction between teachers and students through online platforms such as Zoom, Microsoft Teams, and the like (Karim et al., 2022).

With the COVID-19 pandemic, it is also necessary to create new learning methods to adapt to the COVID-19 pandemic (Hussain et al., 2021). The medical education system faces the urgent problem of developing appropriate clinical skills for future doctors (Mukharyamova et al., 2021). Evaluation of student perceptions regarding the benefits and effectiveness of online teaching strategies needs to be carried out (Rodrigues et al., 2022). This is because students have the potential to influence the success of the educational process and shape student learning. In addition, the rapid and sudden shift in medical education from offline to online requires an evaluation of the existence of this mechanism (Torda & Shulruf, 2021). Medical education needs to build resilience in how Universities deliver medical education and evaluate and generate best practices in the context of the COVID-19 pandemic. Therefore, it is necessary to explore in depth how medical students evaluate online lectures during the COVID-19 pandemic and what medical students' expectations are regarding lectures. By exploring students' assessments and expectations, later they will be able to find out how learning is appropriate to student conditions and the factors that make students satisfied with educational services but can still produce graduates who have competencies according to market needs. In this way, it is hoped that concepts or ideas regarding a wise medical learning system can be created during the COVID-19 pandemic.

### 3. Methods

This research was the evaluation or medical students' assessment of the implementation of e-learning which will be carried out at a State University in Surabaya, Indonesia from 2020 to 2021. Not only that, this

research explores the expectations of medical students regarding medical studies during a pandemic. COVID-19. Data mining was carried out from May to October 2021.

### 3.1 Research Context

The object studied in this research is one of the State Universities in East Java, Indonesia. The university is also affiliated with the Education Hospital. Specifically, this study explores student assessments and expectations regarding medical courses at universities during the COVID-19 pandemic. The university, medical department, also conducts online lectures/e-learning during the COVID-19 pandemic, both for theoretical and practical lectures to prevent the spread of the COVID-19 virus. Carrying out practicum online is a challenge for medical majors because it requires direct interaction with patients and carrying out practical procedures to make it easier to understand, but due to the context during the COVID-19 pandemic, online lectures are inevitable.

### 3.2 Sampling Method

The informants in this study were 12 medical faculty students. Students were chosen because students are customers who receive educational services from the University and experience first-hand how medical education is implemented online during the COVID-19 pandemic (Rodrigues et al., 2022). The sampling technique in this study was purposive sampling, namely informants who fit the research criteria and who participated in this study. The sample criteria are active medical students at X University who have experienced offline and online lectures. Flanagan (1954) states that there are no strict rules regarding the appropriate sample size for qualitative research. Using the purposive sampling method, 12 informants were interviewed based on their knowledge (Cho & Palmer, 2013) and reached data saturation (Tables 1 and 2).

**Table 1.** Student Informant Data

Semester	Age	Gender	Coding	Informants
4	20 years	Man	MHK	I1
4	19 years	Man	MZA	I2
4	19 years	Woman	NZM	I3
4	19 years	Woman	RDK	I4
4	19 years	Man	MFW	I5
8	23 years	Man	BGT	I6
8	22 years	Man	FBK	I7
8	20 years	Woman	WSP	I8
8	21 years	Man	FDA	I9
4	20 years	Woman	ARF	I10
8	22 years	Man	JRKP	I11
8	19 years	Man	CECZ	I12

I= informant

Before extracting information from informants, the research design had received ethics approval from KEPK (Health Research Ethics Commission). This research data mining ends at the 10th, 11th, and 12th informant points because they have reached saturation. Data saturation is a method adopted to decide when data mining should be completed based on 2 main dimensions. The first dimension is that the researcher continues the interview process until the data collected consists mostly of repetition with no new ideas or new insights emerging. The second dimension is the research question (Nadia et al., 2020). If the results and findings are considered sufficient to answer research questions, the research objectives are considered to have been fulfilled (Guest et al., 2006).

**Table 2.** Lecturer Informant Data

Position	Course	Age	Gender	Coding	Informants
Academic Vice Dean	ENT-KL Oncology	45 years	Man	ACR	I13
Coordinator Study Program of Medicine Faculty	Physiology	46 years	Woman	PSR	I14
Teaching Staff	Gynecology	45 years	Man	BPS	I15
Teaching Staff	Eye Health Sciences	45 years	Woman	RZL	I16
Department Secretary	Eye Health Sciences	44 years	Woman	IWN	I17

I= informant

### 3.3 Data Collection and Analysis Techniques

The approach used to obtain primary data is online discussions in the form of FGDs (Focus Group Discussions) through Zoom meetings with recorded informants. The results of the FGD were coded and analyzed. The nature of the FGD which solicited opinions from informants without any pressure (no wrong answers) is expected to provide insight into learning methods that can meet student expectations and meet the needs of achieving learning targets. The questions are open-ended questions which can be seen in the Appendix. The researcher made a guideline of questions only to explore the phenomenon in detail without deviating from the research objectives.

### 3.4 Research Trustworthiness

The validity of this study uses a triangulation technique, in which researchers make comparisons and check the degree of trust in information through different sources (Moleong, 2021). The purpose of triangulation is to ensure the correctness of data or information obtained by researchers from different points of view by reducing as much bias as possible during data collection and analysis.

The validation test was carried out by triangulating sources between students and lecturers. This method ensures the appropriateness of information from various perspectives (Sekaran and Bougie, 2013). Lecturers were chosen because they are providers of educational services provided to students (Hakim & Fernandes, 2017). At this stage, 5 lecturers from the medical faculty were involved as a source to confirm the information provided by students. The lecturers interviewed in this study were active lecturers at the X University medical department who had taught offline and online lectures.



### 3.5 Critical Incident Technique (CIT)

In addition to source triangulation, this research also uses theoretical triangulation, namely comparing the final results of qualitative research with relevant theoretical perspectives to avoid the researcher's individual bias on the findings/conclusions found. Furthermore, theoretical triangulation can increase the depth of understanding of the results of the data analysis obtained. To increase the level of reliability of the research results, a transcript-checking procedure was also carried out by the recommendations (Cresswell, 2014), namely by re-checking that there were no errors in transcribing the research data that had been carried out.

The factors that make up a wise education system are categorized as critical events because they are critical and determine the success of learning. CIT is a procedure used to facilitate research on unusual events (Nadia, 2020) or in this context, it is about looking for factors that form a wise education system in medical education in the context of the COVID-19 pandemic. Therefore, we believe that CIT is the right method to investigate the factors that form a wise education system in the era of the COVID-19 pandemic.

We present the critical incident technique approach used to answer our research questions, which follows Grace's (2007) procedure, adapted to the context of higher education. However, for the data collection method, we used in-depth interviews using the focus group discussion method. In-depth interviews by conducting focus group discussions were used to obtain answers that were more comprehensive, and more detailed and made the informants more comfortable conveying information more richly because they were together with their friends.

After the data is collected, the data is analyzed using content analysis techniques. Content analysis has been proven to be an appropriate analytical technique because it was used by previous researchers using the CIT approach (Grace, 2007; Nadia, 2020). The identified critical incidents (CI) were then categorized as first-order, second-order, and aggregate dimensions using the NVivo 12 Pro software. NVivo 12 Pro is used to analyze qualitative data with the help of a computer.

## 4. Results

### 4.1 Factors That Influence the Formation of A Mindful Learning System

Based on the results of interviews with informants, namely exploring student expectations which answers from lecturers have confirmed, researchers found factors that influence customer (student) satisfaction and this affects achieving a mindful learning system during a pandemic. Which of these factors if satisfaction is created for students then a mindful learning system is created. The meaning of a mindful learning system is taken from the definition of mindful marketing which explains that marketing does not only consider aspects of effectiveness (interests of stakeholders) but also pays attention to the social aspects of marketing activities, namely the interests (fulfillment of needs) of consumers (Hagenbuch & Mgrdichian, 2019). The results for the identified critical incidents for the creation of mindful learning systems are summarized in Table 3.



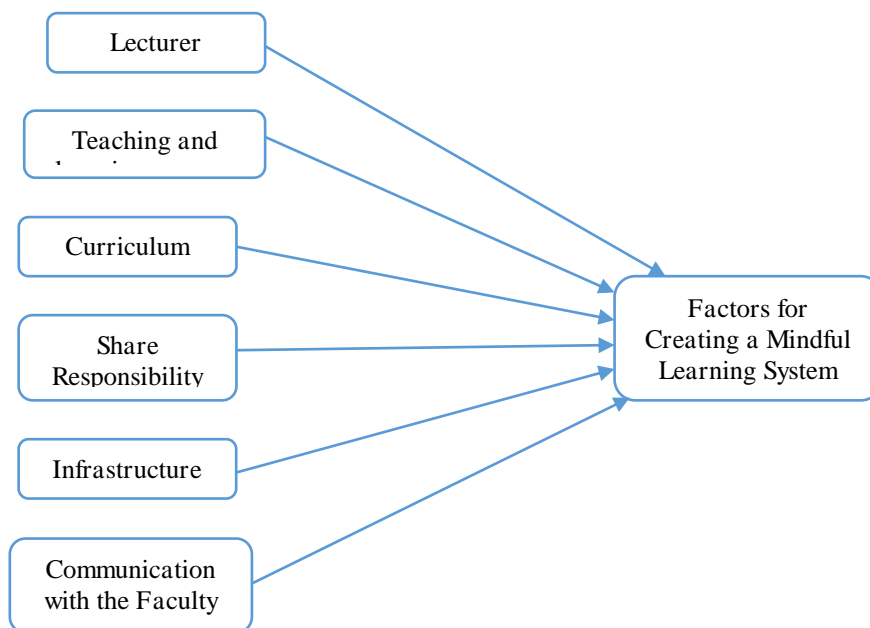
**Table 3.** Critical incident factors-factors creating a mindful learning system

Critical incident factors - factors creating a mindful learning system		Informants <sup>1</sup>		References <sup>2</sup>	
		Count	%	Count	%
<b>Lecturer Quality</b>	Lecturer effectiveness in teaching	3	25%	3	1,6%
	The attitude of the lecturer toward the class schedule	5	42%	7	3,7%
	Ability to create dynamic classes	2	16,7%	2	1,1%
	The role of the lecturer creates an interactive class	4	33%	4	2,13%
	The ability of lecturers to understand material online	4	33%	5	2,7%
	Lecturer constraints in terms of technology	5	42%	8	4,3%
<b>Teaching And Learning Process</b>	Availability is not only theoretical understanding but practical skills	6	50%	9	4,8%
	The effectiveness of online learning	7	58%	21	11,2%
	Schedule consistency and clarity	2	16,7%	4	2,13%
	Feasibility of student assignments	2	16,7%	2	1,1%
	Availability of tutoring outside of class during office hours	4	33%	10	5,3%
	The convenience of online study	4	33%	4	2,13%
	Learning Evaluation	2	16,7%	2	1,1%
<b>Curriculum</b>	Equalization of material in each class in parallel classes	1	8%	2	1,1%
	Achievement of learning outcomes with online demonstrations/practicum materials	6	50%	13	6,9%
	Achievement of learning outcomes with material delivered online	3	25%	3	1,6%
	The support of the curriculum structure for learning outcomes	3	25%	7	3,7%
	Feasibility Proportion of time to teaching and learning	2	16,7%	3	1,6%
	Fulfillment of Expected Learning Outcomes	3	25%	6	3,2%
	LO achievement score	10	83%	13	6,9%
<b>Shared Responsibility</b>	Students prepare lectures before lectures	2	16,7%	2	1,1%
	Students study independently after lectures	4	33%	7	3,7%
	There are group discussions to support lectures	5	42%	8	4,3%

	Student learning styles	3	25%	4	2,13%
	Student personal problems	3	25%	4	2,13%
<b>Infrastructure</b>	Adequacy of a balanced ratio of lecturers and students in 1 class	6	50%	8	4,3%
	Availability of interactive online discussion forums	3	25%	4	2,13%
	Access lecture materials	5	42%	6	3,2%
	Antigen swab facility	5	42%	10	5,3%
	Offline Practicum Exam Facility	1	8%	1	0,5%
<b>Communication with the Faculty</b>	There are student representatives as mediators with the lecturers/faculties	1	8%	1	0,5%
	Availability of a forum for criticism and suggestions related to learning or an evaluation system for implementing learning	3	25%	5	2,7%
	TOTAL	12	100%	188	100%

<sup>1</sup>Percentage of frequency of informants who gave answers according to incidents reported in categories/subcategories for a total of 12 student informants who participated in this study.

<sup>2</sup>Percentage of frequency for references reported over the total number of references from the cause category i.e. references. The reference in question is the incident submitted by the informant.



**Figure 2.** Factors for Creating a Mindful Learning System

Based on data mining conducted on informants, there are 2 major aspects, namely academic and non-academic aspects which are factors in realizing a mindful learning system. Academic aspects are directly related to learning activities, namely the quality of lecturers, the teaching-learning process, curriculum, and shared responsibility. Non-academic aspects are not directly related to the learning and teaching process, namely communication with faculties and infrastructure. So 6 general categories make up the realization of a mindful learning system. The six factors are the quality of lecturers, teaching and learning processes, curriculum, shared responsibility, communication with faculties, and infrastructure (Figure 2).

#### 4.1.1 Lecturers Quality

This variable contains the ability of lecturers to teach, transfer knowledge, and student assessment of lecturers in lectures.

##### Lecturer Effectiveness in Teaching

Lecturers who are effective in teaching are those who can manage their teaching time well. If the lecturer is given 50 minutes, then this time must be optimized for teaching, discussing the material, not even being silent, and no discussion if students don't ask (I3). The effectiveness of lecturers in teaching is also seen in the ability of lecturers to deliver material. Students also said that lecturers teach effectively when lecturers can convey material clearly and at a tempo that is not too fast or slow (I2). According to the students, teaching medical practice skills online is considered ineffective due to limitations in seeing only through a screen that cannot see details in 3 dimensions (I6).

"When the lecturer has been given time, for example, 50 minutes to teach this, the lecturer should teach for 50 minutes more or less, yes, because there are some students who cannot read the material given." (I5)

##### Lecturer's Attitude Towards Class Schedule

According to students, ideally, lecturers should be able to respect the agreed class schedule. Lecturers should not change class schedules often and if they change not on the same day as other courses, so that students do not experience cognitive fatigue due to learning that lasts a full day and do not have an excessive study load at the same time. Based on information from the lecturer, class delays and class rescheduling are possible because the medical lecturer is also a doctor, so sometimes there are sudden surgeries. Students hope that lecturers can respect and adhere to the class schedule that has been set.

"So I hope the lecturers understand that if we have set a schedule then we have to stick to it, so if the time is moved it will not be achieved. Because how come, going online doesn't mean you can study at any time, because students also have other activities." (I2)

##### Lecturer's Ability to Create Dynamic Classes

Students consider that lecturers should be able to create dynamic classes. Don't just ask students and then if no students ask, the lecture ends (I3). Students consider that lecturers in lectures are still lacking in creating dynamic classes because there is still a lack of two-way discussions between lecturers and students (I4). Students also added that lecturers should be able to create dynamic classes, and actively have two-way discussions between students and lecturers (I5).

"Sometimes, in delivering the material, some lecturers only give PPT then later during lecture discussions, the lecturer asks questions, but when no students ask questions, the lecturer immediately closes the lecture, sometimes it happens like that" (I5)

#### Lecturer's Role in Creating Interactive Classes

According to I3, the difference between lecturers in creating interactive classes is felt to have developed. According to him, before (at the beginning of the pandemic) lectures were only explained via WhatsApp or just sending PPTs, but now they are more interactive. However, according to I5, some lecturers do not create interactive classes. That is, the lecturer after giving the PPT, only asked the students whether there were any questions or not. However, after no one asked the students, the lecture immediately ended. Lecturers do not dig further to create an interactive class. Lectures are also often delivered in a classical manner, namely the lecturer tells and reads the PPT so that it is less interactive (I9).

#### Lecturer's Ability to Understand Material Online

Students consider that the lecturer is quite capable of delivering material and preparation of teaching materials (I2). Students also added that lecturers were considered to have the ability to deliver material online and be able to operate Zoom even though some lecturers were still lacking, but some lecturers had done well (I5). There are even lecturers who, in delivering material, make optimal use of Zoom features. Students also said the lecturer was competent in teaching and did not need to be asked and doubted (I3). Even though they are considered very competent, in the early days of online lectures, some lecturers still had to adapt to new things so some were still constrained in terms of technology (I1).

"They are certainly very competent when it comes to teaching, there's no need to question it anymore." (I1)

#### Lecturer Obstacles in Terms of Technology

Students said that lecturers experienced technological constraints when teaching lectures online. The obstacle is when doing screen sharing (sharing the PPT on the lecturer's screen with all students who take part in Zoom). These obstacles finally forced the PJMK (someone responsible for the teaching-learning process in certain courses) to assist the lecturer in operationalizing Zoom (I5). Obstacles in terms of technology often occur at the beginning of online lectures, such as how to join Zoom, share screens, mark things (pins), and view participants (I1).

According to students, lecturers who experience problems in terms of technology are considered to be very detrimental to students because the full duration of 50 minutes to deliver material must be cut off for 30 minutes which has an impact on class hours being delayed and making subsequent lecture hours backward as well, in the end, students no time to rest (I4). The thing that confuses students is when they find lecturers who cannot share screens, but who also do not want to share their PPT files with students, even though by sharing the PPTs, students can share screens to help lecturers be able to convey material to students.

Students hope that before the lecture starts, the lecturer can ask the PJMK about the obstacles related to technology or how to use Zoom so that lecture time is not cut off (I4). The students hope that lecturers can adapt to the changes that exist. Students hope that lecturers will also explore IT issues so they do not harm students when teaching (I2 and I3). As stated by I3, I3 hopes that elderly lecturers who experience technological constraints must also change and learn technology in this transitional period (offline to online

changes).

"So it is hoped that online conditions like this will not only increase students' knowledge of IT, lecturers are also expected to know and understand because the current lecturer's ignorance of technology can have an impact on us, we are really tired because of the postponed schedule earlier." (I2)

#### 4.1.2 Teaching and Learning Process

This variable is closely related to the lecturer category. It refers to how students receive classes. This variable focuses more on the ongoing teaching and learning process between students and lecturers.

##### Availability of theoretical understanding and practical skills

During a pandemic, not only is the theory delivered online, but practicums are also carried out online. Based on information from students, the practicum is carried out online, namely, students are given a video of a practicum example from the lecturer, then students practice practicum based on the video, either directly in Zoom class or by sending a video (I5). Online practicum is carried out by students at home using practicum materials from the students who provide (I9).

Because the practicum is done online, there are practical skills that are impossible to do online, such as doing an infusion because you have never practiced directly (tried directly). Ultimately, his job was to write articles about infusions, but he had no expertise in infusions. Finally, students rated less regarding their medical practice skills (I8). With online practicums, students feel that their practice skills are reduced because they are not used to meeting directly with patients and immediately taking anamnesis, so students feel that skills in terms of clinicians are low (I9).

According to students, studying medicine is not enough just theory but also needs to experience directly meeting patients (I7). Students hope to have more opportunities to meet patients face-to-face.

"It might be good if allowed to meet more patients, but you have to be realistic with the number of students accepted and how many students will receive the lesson." (I7)

After 1 year of online lectures, there is an opening of an offline (direct) practicum with the requirement of a parental approval letter and conducting a swab antigen / rapid test (I3). According to Informant 2, the mechanism for opening offline practicums is that if the course requires a practicum, the lecturer will open a slot to be filled by students who wish to register.

##### Effectiveness of Online Learning

According to students, with this online learning, students feel what they get is not like what their older siblings get. This is because they cannot directly practice medical skills with patients and only a part of the overall medical skills they get (I2).

"We are in trouble and we also have a lot of experience from our brothers and sisters that we don't get, so it's limited to experience with mannequins, we don't experience it directly, so the knowledge we get can be said to be half-half like that, *so it's just like based on theory.*" (I2). With online learning, medical skills are not optimal." (I4)

Learning medical skills is less effective with online learning because they only see videos of lecturer practice and students only imitate (I2, I9, and I6). The drawback of online learning is that student participation is less than in face-to-face lectures (I9). Online learning can also provide an opening for students whose motivation is lacking and absences can be manipulated (I 12). According to students, online practicums with equipment from the students themselves have drawbacks because they are not like mannequins which can sound if students make mistakes (I9). Online learning also provides a loophole for cheating during exams (I6)

Students assess that online learning has advantages in terms of understanding theory and students can repeat recordings of material if they do not understand (I4, I1, and I9).

Students hope that there will be a division, namely for lectures that material is carried out online and for practicum, namely medical skills are given offline because medical skills need to be trained directly in aspects of empathy for patients and psychomotor training (I 6, I 12, and I9). Students also hope that students are given an explanation in advance about why and how to learn, namely why they have to learn about the material and how so that students have motivation in learning (I 12).

#### Schedule Consistency and Clarity

Regarding the consistency and clarity of the schedule, overall, only a small number of classes have a shifted schedule by the lecturer, but overall the class schedule is consistent and the lecturer also tends to match the practice schedule with the teaching schedule. However, some students said that there were lecturers who shifted and changed class schedules. Students said that there were times when the lecturer shifted the class schedule, which ultimately had an impact on the accumulation of lecture schedules on that one day which could be from 07:00 am to 21:00 (09:00 pm) (Informant 5). Students hope classes have consistent schedules (I 5 and I 2).

#### Feasibility of Student Assignments

Based on the information submitted by students, the workload for medical students is not much. Precisely the burden to learn more. As stated by I 10, in the Faculty of Medicine, the study load is more than the assignment load because there is a lot of material studied in the medical department every day and you are always required to understand the material that has been presented, so students often experience brain fatigue (I 10). Moreover, there is also a burden on students if they don't study much, they will be embarrassed if they can't answer. The task load between online and offline learning according to students is not different (I10 and I2).

#### Availability of Tuition Outside Class (During office hours)

At the medical faculty, there are small formal discussion groups called problem-based learning (PBL) where there are a group of students accompanied by a lecturer to have interactive discussions (2 directions) regarding lecture material (I 2). However, PBL is mandatory for all students, and students are divided into small groups accompanied by lecturers for a 2-way discussion regarding the diagnosis of something as if students meet patients and take anamnesis (I 10).

Students consider that students need direct guidance from lecturers because learning through recordings and modules is deemed insufficient because they do not carry out direct practicum and guidance (I 1). However, students tend not to ask the lecturer if there is lecture material they do not understand. Students prefer to ask their friends who are considered smarter or their seniors rather than asking the lecturer directly (I

2). Students assess that there is no culture of asking lecturers outside of lecture hours in medicine. Students feel embarrassed and afraid to ask lecturers (outside the classroom) because according to them lecturers at the Faculty of Medicine are sensitive and must be truly respected (I 10). Students if there are questions prefer to swallow their confusion compared to asking the lecturer (I 4). Students are also worried that asking questions to the lecturer will disrupt the lecturer's busy schedule and that the lecturer's agenda is more important than student questions (I 1). Students think that students should be more independent in learning (I 4).

It was confirmed by the lecturer, namely informant I 17 who said that at the Faculty of Medicine, there is indeed an e-forum that is about tutorials and students have the opportunity to ask questions, but regarding a forum for students to ask questions in the daily lecture schedule, there is still no (in this online lecture). However, if the lecture is offline, students can ask the lecturer directly outside the class when they meet the lecturer on campus.

According to Lecturer I 17, there should be a forum for question-and-answer discussions between students and lecturers but not disturb the busyness of lecturers and students. According to him, it is necessary to create an organized online forum where all students can see if there are questions and answers and lecturers can immediately answer them. However, the question-and-answer online forum should not use the WhatsApp group so that the cell phone does not hang.

#### Ease of Online Studying

According to students, online learning provides convenience in understanding material because it can explore more material, and time and place are more flexible (I2, I3, and I7). Online learning also saves time, cuts transportation costs, lectures can be recorded, and can be more flexible to ask questions (I 12).

#### Learning Evaluation

The exam in Medicine is the OSCE final exam, where the form of the exam is a simulation when you get a patient who comes and then the student as a doctor carries out a physical examination, history, and therapy as if he were in a hospital. Students feel they already know the exam through the materials that must be prepared which are notified by the lecturer (I 8). However, in the early days of online lectures, there were still gaps that could make students cheat and this was evidenced by the drastic decrease in students who did not pass subprogram 1, which was originally around 20-30 people to only 1 person (I 6).

Based on the information conveyed by I 14 (lecturer), learning evaluation is carried out in the middle and at the end of the block. The length of each block varies, some are 4 to 5 weeks. But there are also 1 to 2 weeks. One block is 1 course. Informant 14 said that the exam was in the form of theoretical and practical exams. To guarantee honesty, during exams, students must use SEB (Safe Exam Browser) where students during exams will not be able to open anything other than exam questions. As for the medical practice exam, it is through an online exam where in one Zoom room there are only 10-12 students. I 14 also said that there is a questionnaire for lecturers to assess that lecturers objectively assess students.

In line with what was conveyed by I 6 (student) that there is still a possibility of fraud in online exams, according to I 17 (lecturer) online exams are not feasible because even though students are told to rotate the camera 360 degrees during online practicum exams, students are smarter (to get around) and sometimes there are students who, if they get 2 exams on the same day, there are students who deliberately repeat the course by not passing one other exam and deliberately do UP. At UP, students will work on questions that are 60% the same as the previous exam questions (which they did not pass) and the best score will be taken. And



according to I 17, this is still problematic.

Among lecturers, there is a possibility of a decrease in the exam scoring criteria due to online practicum because the lecturer assesses that students have already prepared their exam tools and materials to carry out practical exams at their homes, for which they have worked very hard to find the equipment (I 14 and I 17). In addition, if the lecturers are letter-lectured with assessment provisions, there will be many students who do not pass.

#### 4.1.3 Curriculum

This variable relates to all courses - courses, credits, semesters, and requirements. This variable also contains the provisions of study hours, the achievement of learning with the existing learning system, the curriculum structure, student expectations regarding learning outputs, and the achievement of learning outcomes between online learning and offline learning (before the COVID-19 pandemic).

##### Material Equalization in Each Parallel Class

According to a student informant, namely I4, there was no standardization from the lecturer regarding the material, so there was some material that was not delivered by the lecturer in several classes, making it difficult during exams. In addition, there is also not enough time to study PPT slides for other classes because there are too many other study materials.

I4's opinion was confirmed by one of the FK lecturers, namely I 17, that the material presented was in principle the same, only each lecturer had developments that were not delivered, so they were not 100% similar. Apart from that, regarding the leveling of the material, I 17 (lecturer) answered that the material was even, he explained when he could become a coordinator, and only explained in his department. In his department, he explained that there is a BANK PPT system so that all PPTs are collected and lecturers who want to teach are shared with PPTs, but lecturers are allowed to make edits such as updated words or things.

##### Achievement of Learning Outcomes with Teaching Aids/Online Practicum

I2 explains that the practicum obtained does not get direct experience because it only uses mannequins, so the knowledge gained is only partial, and I4 provides an additional opinion that what is explained by I2 regarding practicum cannot be optimally practiced.

"So the knowledge that we get can be said to be half-half, so it's just like based on theory, like that." (I4)

Regarding understanding I4, adding that offline practicum is more effective than online practicum because online practicum is only given slides, the effect is not to carry out direct practice related to doctor's work such as thin and thick blood smears. I2 added that students' online practicums were only given examples in the form of videos and practiced independently. Learning like that makes him not know whether there is a mistake in doing it and can't interactively ask questions. Which results in practical skills not being honed.

According to I9, online practicum materials are not representative of practical use. In line with I9 and I7, they respond that practicum with non-representative or unusual materials will not produce the competency results they should. I7 agrees more with offline practicum than online, because online cannot replace both in terms of feel, exams, and practical knowledge.

"So with the condition that we prepare the goods ourselves and conduct experiments on unusual goods, of course, it will not produce the results of the competencies that should be." (I7)

Also added by the student, namely I 12, by exemplifying the non-representation of the material used in practice towards the achievement of skills, by providing criticism regarding the material used in practice such as changing baby bottles, when injecting the buttocks using pillows and others. Algorithmically the sequence of processes can be understood but medical practice expertise cannot. So online practicum cannot reach the doctor's expertise and cannot build the doctor's empathy.

The students' opinions were confirmed by several FK lecturers such as Informant 15 who said there was a problem with medical skills due to online practicum during a pandemic. But I15 also did not necessarily give up on such a situation, he also continued to monitor. I 15 also provides policy recommendations to increase the proposed study period at the university so that the skills shortage can be met. In a pandemic, according to Informant 15, one cannot think ideally like before the pandemic.

The lecturer, namely I 16, agrees with I 13 regarding achieving his skills which are still relatively small in practice, namely only 30%. According to the lecturer, namely I 13, the students were still unprepared for practical output skills. He gave an example that students still have difficulties regarding how to suture wounds, how to circumcise, diagnose mild cases as well as difficulties especially complex cases, according to him students must be confused. He (I 13) nicknamed students who graduated from the pandemic online doctors because they only had a short hands-on practice.

"Then they examine the patient, come on, how do you stitch up this wound? Confused, maybe not. If they are asked to do circumcision, they shake their heads." (I 13)

The lecturers we interviewed were deputy deans and heads of undergraduate medical study programs, so they understood that the curriculum was designed to meet users' needs (graduate users). Based on the lecturer's statement, namely I 13 and I 16, shows that with online practicums, medical graduates are not proficient in medical practical skills. This was also confirmed by the lecturer, I 14, who said there were learning outcomes that could not be achieved with e-learning.

"Frankly, I just became a KPS in December 2020, so the decision that was made by the previous leadership was indeed a learning process, if I'm not mistaken, per March, as of March 2020 it was online and then I was not allowed to go to campus because there were many cases at that time there were many positive cases. at that time right so from here it depends later on in sub-program 1 the practicum is really like this, yes there are a lot of CPLs from practicum, but in basic science, the main CPL is to strengthen knowledge, so actually he doesn't do something like that, but There are a lot of things that can't be replaced offline, right, Ma'am, for example, how does he work with people, how does he have to respect other people, then there are also skills that he will get even though it's not his main CPL but he's like an additional learning outcome, well, that's what is possible from the additional we can't achieve high, but that the main CPL, what is the name of the main learning achievement which is to deepen or complement the knowledge in college, God willing, it has been achieved, for those who are in basic science, for subprogram 1." (I 14)

### Achievement of Learning Outcomes By Delivering Material Online

According to I1 and I2, the materials provided online such as recording media, PPT, and modules for I1 are not enough to provide understanding and skills for students but also require guidance and a more real experience directly if there is a doctor. I2 assessed that the video from the lecturer was quite difficult for him when practicing again and a video was made. The video only tends to follow what the lecturer is doing, but you don't understand what it means.

Meanwhile, according to I6, he considers that courses that only teach to understand are sufficient by providing material provided online. But for courses that require connecting with patients and interaction with patients (medical skills), I6 provides additional advice, namely offline.

The student's opinion was confirmed by the lecturer (I 15) giving the opinion that an understanding of online material was achieved. Informants from other lecturers also added (I 16), in the item about the eye that is the competence of general practitioners it is not too much of an obstacle for online learning and he added that related theory can also be very well studied. Other lecturers, namely I 14 and I 17, added that in terms of understanding, online children are still better than offline children. According to I15, theoretical lectures and knowledge in nature are not a problem, students are already smart, and if it's only theory and knowledge they can do it.

### Support of Curriculum Structure for Achievement of Learning Outcome

According to I9, FK undergraduate education seems only theoretical, different from when it was a profession. Learning only studies the disease without ever being given material complaints per patient directly. Students only focus on being given information per disease, not per complaint.

"Then there is the addition of the FK education system itself, we only study diseases, whereas we have never been given material complaints from patients. So maybe we studied, pulmonary disease, pneumonia, pleurisy, this, this, but, when entering the professional education of young doctors, some of us met patients who were short of breath and were still confused because we are used to studying each disease and not per complaint." (I 9)

According to Informant 8, he also added that related to pre-clinical practice, it had to be prepared beforehand so that when he was brought to the young doctor there were no problems. But because it's online like this, students don't get the maximum provision. I8 gave an example of putting infusions, students couldn't.

Other students provided feedback regarding the interrelationships of the subprograms in the Bachelor of Medicine Faculty of Medicine. Informant 12 explained that according to him subprograms 1,2,3 were not in sync with each other. For example, subprogram 1 is too theoretical, so much knowledge is wasted because it is often difficult to connect between subprograms 1, 2, and 3. Ideally, subprogram 1 will serve as a provision for subprogram 2. In addition, related to the material provided in subprograms 2 and 3, the material in the form of PPT is given with the same content, so there is no difference in subprograms 2 and 3. Apart from that, only studying diseases through PowerPoint does not explore the patient's condition directly. The effect is that when meeting patients, they are even confused because the supplies are not ready and out of sync.

I9 also added that PBL between subgrams 1 and 2 according to him was less related to case studies, which according to him increased the frequency. The more often students train themselves in a case, the better students will be. Finally, I12 conveyed related to the learning system in medicine by considering aspects including students, instructors, materials, and methods. I 12 gave an opinion that students should be given material related to why and how when they were studying medicine so that they are not abstract, know how to study medicine and have enthusiasm. From the teaching point of view, I 12 does not need to convey too much theoretical information, but there are many real cases of lecturer experience when treating patients. Finally, suggestions regarding the synchronization of curriculum and material based on complaints are not the name of the disease.

#### Feasibility Proportion of Teaching-Learning Process Time

I 5 gave his opinion regarding the evaluation of the time during lecture hours which was too long and not limited so other regular lecture schedules shifted. I 11 also explained that the schedule and time for lectures were too busy, plus there were lots of study materials and no time to read everything. I 11 advised going to college so that the material given was more effective and basic in nature and could be studied independently. This material will support students to study in the block.

"Maybe it's more about setting the time for study hours, because Zoom seems to have no time limit, so we sometimes have lectures outside of normal lecture hours, for example, if it's offline it's from 07:00 to 16:00, but this online lecture there is a class schedule that shifts from 7 am to 9 pm" (I 5)

#### Fulfillment of Expected Learning Outcomes

I2 students thought they needed practice because they felt they lacked lab skills. Upper-semester students in their profession, I6, explained that practicum material can't be carried out online. I6 gave an opinion to imitate universities outside to implement offline practicums during a pandemic.

I2 also provided input regarding the orientation of medical education not only for clinicians but also for researchers and bureaucracy. These three orientations must be introduced to students and become a learning curriculum that can support this because so far undergraduate education has focused on clinicians only. I2's opinion is also supported by I12 where students must have an orientation during the lecture process so that graduates can continue into any field whether it is clinician, researcher, or bureaucracy. I 12 describes the ideal doctor who is not only smart but also smart in his brain, hands, and heart.

#### Learning Outcome Achievement (LO) Scoring

This comparison of online vs. online learning LO achievement scores will serve as a reference for how the description of achievement in each lesson (online vs. offline) is based on student opinions. I1 gives an assessment for offline 8 and for online learning, it is 5. While other students who are in the same batch as I 5, give an assessment of 10 for offline learning while online is still in category 7. While other students give online scores between 5-6 and offline 9- 10. This shows that online gets a score below 6 points while offline is still at 9 points.

I 1: "Okay, from numbers 1 to 10, for me, if it's offline, it's probably 8, if it's online, it's probably 5 or 6"

I5: "From me, if you go online yourself, 7 if it's a matter of skills and others. But if it's offline itself it's 10 *maybe*"

I 2: "For me, because medicine is very practical, that's how it is, so offline I give 9 aunts, for example online it's 5"

I9 explained that discussion was reduced in online lectures and that could not meet patients face to face, which made the score low. I9 gives an opinion if students from the beginning to the end of the semester use online then students will not be used to dealing with field conditions.

Meanwhile, other students (I 12) detailed their answers in scores divided into cognitive, affective, and psychomotor. For cognitive targets given online learning, it gives a score of 7-6, while for psychomotor online it is given a score of 3. For offline it can be 8 for psychomotor. Whereas affective is given a value of 4 for online while offline is given a value of 7.

#### 4.1.4 Share Responsibility

This variable relates to how students also play an active role in efforts to support effective learning, such as studying during pre and post-lectures, group discussions (outside lectures) to discuss lecture material, having a special learning style to be able to understand lectures well and have a role active in giving criticism and suggestions for the realization of good learning.

##### Students Prepare Lectures Before Lectures

Medical students tend to prepare before attending class. In preparing lectures, students must look at the course, so what can you do to prepare for lectures (I2 and I3)?

##### Students Study Independently After Lectures

Medical students also independent study outside of college as their learning responsibility as prospective doctors who must be familiar with their field and understand a topic or material in particular courses. They independently study through exploring material from the internet, PPT material, internet, YouTube, and journals. There is a tendency for medical students to prefer studying on their own. They are not used to asking lecturers because they are busy and seniors. There is a feeling of embarrassment and fear when asking the lecturer (I2 and I4)

##### There Are Group Discussions to Support Lectures

There are informal discussions outside the classroom by discussing certain matters or asking colleagues or seniors if something is misunderstood. Hold discussions together or study together with friends. But learning together is not always done, because it is only to create an atmosphere of learning together, but often self-learning (I 1 and I8).

## Student Learning Style

Every student has their learning style and cannot be compared, some learn from listening to others, being active in class, reading literature, taking notes on material, etc. But the most important thing is to know which tendencies and are comfortable with what learning style (I4 and I5). That is what students apply when studying.

## Student Ability to Solve Personal Problems

There are several student problems when lectures are online, which are taken from the opinions of students who have experienced learning. Among them:

- (1). Problems in participating in online class learning when at home, such as being lazy, and wanting to sleep so that you don't take online classes to the fullest
- (2). Personal-life problems for students during online lectures at home that they cannot avoid and disrupt lectures such as having to help parents at home
- (3). The atmosphere of online lectures at home is less supportive and there is an incentive not to focus

"Only because it's online maybe the problem is not a problem from the faculty but a problem from the individual, like when you're at home you're naturally sleepy, then it's like studying while in bed and later sleeping like that." (I 2).

So, students must overcome these personal problems so that lectures can be optimal.

### 4.1.5 Infrastructure

This variable relates to all the facilities the University provides (as an educational service provider) to students (as a customer). This relates to the adequacy of the ratio of students and lecturers in 1 class, the availability of interactive online discussion forums related to lectures, access to lecture materials, swab antigen facilities, and offline practicum exam facilities.

#### Adequacy of Student and Lecturer Ratio in 1 Class

Regarding the ratio of lecturers and students in one class, there are 2 general opinions, namely large classes are not a problem and small classes should be. According to the final batch of medical students, medical classes should be kept small, not 120 people in 1 class. With small classes, it is easier for lecturers to monitor students to focus and small classes make students learn more because students are afraid if they cannot answer questions in class and small classes can encourage more discussion (I8, I9, and I11). Small classes can also lead to higher engagement between lecturers and students and higher student learning initiatives (I8).

However, according to the lower grade students (mid-semester), the ratio of lecturers and students in a class that is quite large (70 to hundreds) is not a problem (I4 and I10). It becomes an advantage for them because they can turn off the camera without answering questions from the lecturer (I4). With large classes, students have the advantage of not needing to turn on the camera (I2).

The statement of senior students who suggested small classes was also supported by lecturers namely I 17 who said that it was more effective to divide into several classes and sessions in small classes with no more than 20 people so that students and lecturers could be more active in conducting discussions.

#### Availability of Interactive Online Discussion Forums

Students hope the Faculty can provide a place to have interactive (2-way) discussions directly without waiting. In the Faculty of Medicine, there is e-learning using the hall and students can ask questions, but it can take up to 2 days to get answers to the questions they get and according to students, it is still less interactive (I 11). Students think it is better to have discussions such as Zoom where students and lecturers can directly discuss and ask questions (I9). Students of the final batch also claim to have an online discussion forum for questions and answers with lecturers but through the website. However, it is still less interactive because students do not know when the lecturer will answer their questions (I9). Discussion forums at the Faculty of Medicine are like the PBL (Problem-Based Learning) program, where students are divided into small groups during online practicums. But for ordinary classes, there is usually no discussion forum (I2).

#### Access to Lecture Materials

Students said there were changes at the beginning of the pandemic until after online lectures had been running for approximately 1 year. At the beginning of online lectures, there was no access to material in the form of PPT until students had to ask seniors. But now you can get PPT files and audio and video (I 1). So that it is clearer to understand the material through the PPT given by the lecturer.

However, even though there are lecturers who distribute PPT files to students, it is not uncommon for students to find lecturers who do not want to share their material (PPT files) even though students need to study it again. There are even lecturers who don't want their lectures to be recorded (I4). Students conveyed that the reason lecturers were reluctant to share their PPTs was because of copyright. Students can only rely on PPT material from seniors (I2 and I3).

Based on information from the lecturer, the lecture was recorded so that students could also play and re-understand the lecture that had been conducted. Besides that, in the Faculty of Medicine itself, in the hall, there are PPT facilities and recordings of lectures (representatives of courses). According to the lecturer, namely I 14, it is not a problem if students get PPT material and record video lectures because that is the student's right (I 14 and I 17). However, it is undeniable that there are lecturers who are reluctant to share PPTs because according to them they are copyrighted (I 17).

#### Availability of Antigen Swab Facilities

Based on the students, the Faculty will hold an offline practicum but must be on the condition that students first swab D-1 before attending the offline practicum (I2). According to the students, if there are offline lectures, namely for practicum, students are also given facilities for swab antigens or rapid antigens provided by the Faculty of Medicine (I1). According to students, the campus should have facilitated the facility for the COVID-19 test in the form of rapid antigen or swab antigen, considering that all lectures have been online so far and practicums are also mostly online, not even offline, so students should pay the UKT Faculty of Medicine to cover the cost of the COVID-19 test for students who want to take part in offline practicums because the tuition fees for the Faculty of Medicine itself are already expensive. So that students hope that the



Faculty will provide facilities for the COVID-19 test for students who want to take part in offline practicums so that it can make it easier for students and more and more students are taking part in offline practicums (I1, I4, and I5).

#### Online Practicum Exam Facility

Based on information from students, the Faculty of Medicine has offline practicum facilities where students who wish to participate in offline practicums can register with the Faculty. 20 students have registered and the conditions are a statement of approval from parents and showing that they are free from COVID-19 through a swab antigen or rapid antigen test (I2 and I3).

Based on information from the lecturer, finding cadavers in the context of the COVID-19 pandemic is very difficult because if someone dies they are not afraid of getting COVID-19 and infecting it (I 13). According to the lecturer, the facilities and infrastructure and the education budget for preparing all learning online, even for planning hybrid lectures (offline and online), are not ready and the lecturers don't even know the concept. By the campus, lecturers are told to find their hybrid form. So the facilities and infrastructure for preparing online and offline lectures known as the hybrid model are considered unready (I 13).

#### 4.1.6 Communication with the Faculty

This variable relates to all the facilities the University provides (as an educational service provider) to students (as a customer). This relates to the adequacy of the ratio of students and lecturers in 1 class, the availability of interactive online discussion forums related to lectures, access to lecture materials, swab antigen facilities, and offline practicum exam facilities.

#### There Are Representatives From Students as Mediators With the Faculty

According to I2, there is a student representative, BEM (Student Executive Body). BEM is a student representative, namely conveying student aspirations to the Faculty. Often BEM conducts assessments to explore what data is desired and expected from medical students (I2).

#### Availability of Containers for Criticism and Suggestions related to Learning

The forum for criticism and suggestions for students is in the Faculty of Medicine. Informant 5 said that at the end of the lecture block, students could convey their criticisms and suggestions regarding learning. The campus also facilitates this forum for criticism and suggestions through the BEM (Student Executive Body), where students can convey all their aspirations to BEM so that BEM can convey them to the Faculty. Faculties also often ask for student opinion polls before making a policy (I 2) via Zoom. What students convey is also heard and followed up through Faculty policies (I1). This was also confirmed by the lecturer, namely I 14, who said that for students it is usually delivered (criticisms and suggestions) during the middle or end of the block. Block duration is 4-5 weeks or 1-2 weeks. 1 block means 1 course.

After identifying the first-order concept and second-order themes from the forming factors for creating a mindful learning system, the research results are summarized in the number of identified critical incident percentages as shown in Figure 3. Based on the results of this research a framework of forming factors has been found wise learning system. The formation factors are based on the critical incident results, where there

are first-order concepts, second-order themes, and aggregate dimensions. First-order concepts namely lecturers, teaching-learning process, curriculum, share responsibility, infrastructure, and communication with faculty. The second-order themes from the lecturer are the effectiveness of the lecturer in teaching, the attitude of the lecturer towards the class schedule, the ability to create dynamic classes, the lecturer's role in creating interactive classes, the lecturer's ability to understand material online, and the lecturer's constraints in terms of technology. The second-order themes of the teaching-learning process are the availability of theoretical and practical understanding, the effectiveness of online learning, the consistency and clarity of class schedules, the feasibility of student workloads, the availability of outside-class guidance during office hours, and the convenience of online lectures. The second-order themes of the curriculum are the equalization of material in each parallel class, the achievement of learning outcomes with online demonstrations/practicums, the achievement of learning outcomes with materials delivered online, the support of the curriculum structure for learning outcomes, the feasibility of the proportion of teaching and learning process time, the fulfillment of expected learning outcome, and scoring the achievement of learning outcomes. The second-order themes of shared responsibility are that students prepare lectures before lectures, students independently study after lectures, there are group discussions to support lectures, student learning styles, students have personal problems and students play an active role in providing criticism and suggestions related to learning. The second-order themes of infrastructure are the adequacy of a balanced ratio of lecturers and students in 1 class, the availability of interactive online discussion forums, the availability of access to lecture materials, and online practicum exam facilities. The second-order theme of communication with the faculty is the existence of student representatives as mediators with the faculty, and the availability of a forum for criticism and suggestions related to learning. All the first-order concepts and second-order themes are aggregated into factors that form a wise learning system.

## 5. Discussions

Data from interviews with informants show that the COVID-19 pandemic has caused medical courses to be held online. The impact felt by students is that their understanding of student material is getting higher because they can repeat material through recording Zoom. However, students complain and worry about the medical technical skills they get. Students consider that online practicum lacks the medical practice skills they want.

The results of this study develop the mindful marketing theory put forward by Hagenbuch and Mgrdichian (2019), namely marketers not only consider the profit aspect but also consider the fairness aspect to customers, namely providing products according to customer needs and desires and always exploring customer expectations. This research develops mindful marketing theory in the context of education. This study found the factors that make up a mindful learning system based on exploring customer (student) expectations.

Currently, Universities are starting to realize the role of students as customers and Universities as educational service providers (Kilburn et al., 2016). Students are the main reason for education (Cladera, 2021), therefore student voices must be heard to assess and improve various aspects of a wise education system. Discovering the most important aspects from a student's point of view directly benefits the University in determining a wise education system. This is because it will assist lecturers in improving planning and developing courses, adjusting course delivery, and lecturer performance. Also, exploring students' assessments and expectations will make students aware of the important role their involvement plays in educational issues and feel that the University is hearing their voices.

Arrieta and Avolio's research (2020), which is one of the previous studies that was used as the basis for this research, found that students' hopes/expectations regarding the lectures they wanted and what made them feel satisfied were the curriculum, professors, admissions, infrastructure, extra-curricular activities, lectures, communication with faculty, library services, and others. Meanwhile, Moslehpour et al. (2020) found 2 broad categories categorized into academic and non-academic aspects. Academic aspects are directly related to lectures, the teaching-learning process, and the curriculum. Non-academic aspects are other aspects that are not directly related to lectures but support them. In this study, 2 major categories were found, namely the academic and non-academic categories. The academic categories found in this research are lecturers, teaching-learning process, and curriculum. The non-academic categories found in this research are infrastructure and communication with the Faculty. This research finds a new dimension that forms a wise education system, namely shared responsibility. Previous studies (Arrieta & Avolio, 2020; Goldhaber et al., 2020; Pham et al., 2019; Rodrigues et al., 2022; Zarcone & Saverino, 2022) found that academic and non-academic dimensions, but have not found that there is the dimension of shared responsibility between the University and students who are equally responsible for the success of student learning. So with this new finding, it is useful for lecturers and students to know their roles and responsibilities in the education system so that not only universities are trying to optimize it but also students.

Lecturers are one of the dimensions identified as a factor shaping mindful learning in higher medical education during a pandemic. The lecturer is a factor that determines student (customer) satisfaction. Aspects of lecturers that often determine the success of learning are quality in delivering material, attitudes, teaching style, and lecturer support to students (Weerasinghe & Fernando, 2018; Wilkins & Balakrishnan, 2013).

Lectures are an important aspect for students because it is an aspect of the teaching and learning process that determines the skills they acquire. This includes academic counseling when needed, consistent class hours, sufficient time to study, and other aspects of the teaching and learning process (Arrieta & Avolio, 2020).

Interactive teaching and learning processes, providing material in theory and practice, lecturers who can motivate students, providing an education system that provides student interaction with faculty and a curriculum that can achieve better learning outcomes are important factors in implementing a wise education system in this era. online education (Pham et al., 2019). The experience of the learning process in class has been shown to play an important role in student satisfaction and student consistency in continuing to continue to the next semester (Gantasala et al., 2022).

Study conducted by Pham et al. (2019) found that the quality of e-learning services provided by universities affects student satisfaction and the overall quality of e-learning. In his research it was also found that the factors of student satisfaction were related to the teaching and learning process (course materials), quality of lecturers (instructors), and other supports (infrastructure).

Implementing a good education system does not only require core (academic) factors but also requires other supporting factors such as infrastructure so that education runs well (Martinez-Arguelles & Batalla-Busquets, 2016).

Students have a role in the success of learning. The role of students in supporting learning success in this study is called shared responsibility, where it is not only the faculty/university that is responsible for the success of learning targets, but students must also actively contribute by preparing for lectures, focusing in class, reviewing lecture material, and able to overcome their various personal problems that could hinder the success of learning. This is based on the social exchange theory that universities and students have a shared

responsibility for the success of student learning (Sierra, 2010). Lecturers are responsible for student learning by preparing classes, leading discussions, and giving learning assignments. Meanwhile, students are responsible for learning by coming to class prepared, participating in class discussions, and giving their best effort in learning assignments.

### 5.1.1 Conclusion

The concept of a wise medical education system in medical education in the era of the COVID-19 pandemic fulfills the six factors found in this study. These six factors are summarized in 2 major categories, namely the categories of academic and non-academic aspects. The academic aspect consists of 4 dimensions, namely lecturer dimensions, teaching-learning process, curriculum, and shared responsibility. The non-academic aspects consist of 2 dimensions, namely the dimensions of infrastructure and communication with faculties. Details are summarized in Table 4.

**Table 4.** Mindful Learning System

Dimension category	Dimension	Dimension Items	Expectation
Academic Aspect	Lecturer Quality	Lecturer effectiveness in teaching	Lecturers can optimize teaching time well
		The attitude of the lecturer toward the class schedule	Lecturers respect the class schedule by following the schedule consistently
		Ability to create dynamic classes	Lecturers can make class less boring with non-monotonous teaching methods
		The role of the lecturer creates an interactive class	Lecturers play an active role in creating interactive classes
		The ability of lecturers to understand material online	Lecturers can explain material well through online devices
		Lecturer constraints in terms of technology	Lecturers can overcome obstacles in terms of technology
	Teaching and learning process	Availability is not only theoretical understanding but practical skills	The campus provides offline medical theory and skill courses
		The effectiveness of online learning	Online learning is effective for providing medical theory, but not effective for medical practice
		Schedule consistency and clarity	The class schedule is consistent and clear
		Feasibility of student assignments	The workload is not excessive
		Availability of tutoring outside of class during office hours	There is guidance outside the classroom between lecturers and students through interactive and flexible online forums

		The convenience of online study	Online lectures make it easy for medical theory
		Learning Evaluation	Evaluation of learning, in theory, can be done online using SEB, but for medical practice, it must be done offline
	Curriculum	Equalization of material in each class in parallel classes	The material delivered in the parallel class is the same
		Achievement of learning outcomes with online demonstrations/practicum materials	Online practicum is not effective, so practicum must be carried out directly (offline)
		Achievement of learning outcomes with material delivered online	Learning outcomes are only achieved below 6 points when using full online lectures. So that the campus should provide offline medical practicum and online medical theoretical material
		The support of the curriculum structure for learning outcomes	The curriculum structure between subprograms 1, 2, and 3 should be related to each other and the curriculum should be able to facilitate 3 outputs in the medical field (clinicians, bureaucrats, and researchers)
		Feasibility Proportion of time to teaching and learning	The campus provides sufficient time for students to study pre and post-college
		Fulfillment of Expected learning outcomes	Expected learning outcomes with a full online presence are not fulfilled properly. Theoretical courses should be delivered online and medical practicum offline
		LO achievement score	The LO achievement score with full online is below the number 6. So, it is hoped that there will be blended learning, where the delivery of material is carried out online, but for medical practicums offline
	Share Responsibility	Students prepare lectures before lectures	Students actively prepare lectures before lectures
		Students study independently after lectures	Students actively study independently after lectures by reviewing the courses they have studied

Non-academic aspects		There are group discussions to support lectures	There are small group discussions related to lecture topics
		Student learning styles	Students have learning styles that can support learning
		Student personal problems	Students can overcome their problems so as not to interfere with lectures
	Infrastructure	Adequacy of a balanced ratio of lecturers and students in 1 class	Classes are kept small (only 25-30 people in one class) so that discussions can take place effectively and interactively
		Availability of interactive online discussion forums	There is an interactive online discussion forum between students and lecturers and is flexible
		Access lecture materials	Students get access to lecture materials in the form of lecture recordings and PPT files
		Antigen swab facility	Students get a free swab antigen facility from the campus if needed for medical practice
		Offline Practicum Exam Facility	The campus provides medical practicum exams offline
	Communication with the Faculty	There are student representatives as mediators with the lecturers/faculties	There is a forum in the form of HIMA and the like as student representatives
		Availability of a forum for criticism and suggestions related to learning or an evaluation system for implementing learning	The campus provides a place for students to provide criticism and suggestions related to learning

### 5.1.2 Implications

This research has theoretical implications, namely developing the mindful marketing theory put forward by Hagenbuch and Mgrdichian (2019) in the context of higher education. This study found the factors that make up a mindful learning system based on exploring customer (student) expectations. In addition, this research has novelty in finding the dimensions of shared responsibility between universities and students who are equally responsible for the success of student learning. This finding was not found in previous studies (Arrieta & Avolio (2020); Goldhaber et al., 2020; Pham et al., 2019; Rodrigues et al., 2022; Zarcone & Saverino, 2022). With this new finding, it is useful for lecturers and students to know their roles and responsibilities in the education system so that not only universities are trying to optimize it but also students.

This research has several benefits. First, this research is useful for Higher Education to improve the education system in the context of the COVID-19 pandemic by applying the concepts found in this research so that a wise education system can be achieved. Second, this research can also be useful for education stakeholders such as students, lecturers, curricula, and users of educational services to be able to find out the factors that form a wise education system and their respective roles in a wise education system. Third,

considering that the online learning system also provides benefits, especially in providing the material that allows flexible access, it can still be considered for implementing blended learning. However, to achieve the ability to practice medical skills, they still use face-to-face lectures (offline). Fourth, based on the results of in-depth interviews with students, several things that are expected to be accepted by students in online lectures include dynamic and interactive lectures between students and lecturers, lecturers who can motivate students, consistent class schedules, curriculum structures that can produce doctors who experts in theory and practice, the role of students in education by being responsible for preparing lectures and optimally carrying out their duties, there is an infrastructure that supports student and faculty education and communication which must be well maintained.

Factors that influence student satisfaction have been found in this study. This is useful for universities in creating a wise education system in the era of the COVID-19 pandemic. When the education system created and implemented is ethical, effective, and fair for the parties, it will create student satisfaction. When students are satisfied, these students can carry out their role to share responsibility for achieving the expected learning output (Sierra, 2010). In addition, satisfied students can freely recommend and advertise the University to their friends or family to study at the University (Eom & Ashill, 2018; Kilburn et al., 2016).

### 5.1.3 Limitations and Future Research

This study has limitations. First, in this study, the factors forming a wise education system were found. To get a broader generalization, it is necessary to do quantitative testing. In future research, it is necessary to conduct quantitative tests on the factors that form a wise education system. Second, this research is the first step to revealing the factors that make up a wise education system using the exploratory method. Future research could develop items measuring the factors that make up a wise education system that could contribute to empirical studies so that University policymakers could continue to develop the managerial actions needed to improve the education system.

Although this research has limitations, we believe that using qualitative methods has an important contribution to further research on online education systems during the COVID-19 pandemic. Regarding the purpose of this research which explores in depth the assessment and expectations of students for the learning process, this research obtained in-depth insight into a wise education system during the COVID-19 pandemic. which cannot be obtained if using quantitative research methods.

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## Appendix

### A.1. Interview guidelines for students

1. What form of lectures are you currently running?
2. Do you agree or disagree with the online lectures that are currently running? If not, why? If so, why?
3. In your opinion, what are the advantages and disadvantages of online learning that you feel?
4. What do you think about the material currently being provided online? Easy to understand or not? Explain
5. In your opinion, what is the role of the lecturer/teaching team in the current learning process, is it helpful or not, explain?
6. What do you think, is the lecturer's current ability to carry out the learning process online? Explain
7. What do you think, about this online learning, can it support the formation of your expertise as a doctor or medical staff?
8. How were the materials provided during this pandemic?
9. How would you rate your skill score as a doctor later, if you use online learning now? (Range number 1-10)
10. In your opinion, what kind of learning is appropriate during a pandemic that supports the formation of skills?
11. In your opinion, what kind of material supports the achievement of learning objectives during a pandemic? What form is it in, and what is it delivered with?
12. In your opinion, what kind of lecturer supports the achievement of learning objectives during this pandemic? Regarding teaching, the skills needed.
13. In your opinion, what should you do so that before, during, and after the teaching and learning process takes place optimally and gives maximum results?
14. In your opinion, how does online learning compare to previous (offline) learning in terms of the quality of material delivery and material understanding? If on a score of 1-10, what is the comparative score?

### A.2. Interview Guidelines for Lecturers

1. Do you agree with the ongoing online lectures at Unair? If not, why? If so, why?
2. In your opinion, what are the obstacles and challenges in the online learning process?
3. In your opinion, what are the advantages and disadvantages of online learning at UNAIR?
4. In your opinion, how is the delivery of the material that has been delivered so far? Does it make it easier for students to understand lecture material or what?
5. What do you think about the ongoing online lectures in forming maximum expertise/maximum learning in forming medical expertise?

6. In your opinion, what skills score do students get with online learning? (Range number 1-10)
7. In your opinion, how does online learning compare to previous (offline) learning in terms of the quality of material delivery and material understanding?
8. In your opinion, the role of the lecturer/teaching team is what can encourage the success of a teaching and learning process. How is the preparation and ability of the lecturer to carry out the online learning process?
9. In your opinion, what things do lecturers need to improve regarding online lectures?
10. In your opinion, how is the preparation and ability of the lecturer to carry out the online learning process?
11. In your opinion, what should students do before, during, and after the teaching and learning process takes place optimally and gives maximum results?
12. In your opinion, what kind of maximum learning outcomes should be achieved in health student education?
13. What are your expectations regarding ideal learning in the context of the Covid-19 pandemic?