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Relationship Undergraduate Medical Students' Summative Assessment and Learning Management System Readiness at A Public University in Indonesia

Wastucitra Cantika[1], Agus Sugiharto[1], Dewi Friska[1]
[1]Universitas Indonesia, Indonesia

ABSTRACT
Purpose – Good student readiness is needed, especially for medical students who are required to lifelong learning. This study aims to assess the relationship between student readiness related to LMS and the summative test score of the Primary Healthcare System module (SPKP) for students of the Faculty of Medicine at the University of Indonesia.
Methods – This research is a cross-sectional design. A total of 191 respondents from fourth-year medical students of the Primary Healthcare System module, the Faculty of Medicine, at the University of Indonesia, participated in this research. The questionnaire consists of 5 dimensions and 10 questions with answers rated one to three. The measure of readiness is determined by the median value. The data were analyzed using the chi-square test.
Findings – The findings revealed that 51.3% of students are ready to accept learning at LMS. The most obtained SPKP module summative score was B-, with a total of 31.4%. It was found that there was a relationship between student readiness related to the learning management system and a summative test score, with a P-value of 0.04 for the primary healthcare system module in medical students at the University of Indonesia.
Research Implications – This research contributes to universities, lecturers that it is necessary to conduct technical system training at the beginning of the semester, provide easily accessible interactive modules, and strengthen infrastructure to support independent learning.

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Corresponding Author:

Agus Sugiharto
Department of Community Medicine, Faculty of Medicine, Universitas Indonesia, Indonesia
Email: agus.sugiharto@ui.ac.id

Introduction

The use of learning management systems (LMS) is increasingly supported by the Coronavirus Disease 2019 (COVID-19) pandemic, which has occurred in the past two years and has impacted several sectors, including the education sector. According to data from the United Nations Educational, Scientific, and Cultural Organization (UNESCO), there are 168 million students whose learning activities have been disrupted due to school closures throughout the world due to the COVID-19 pandemic (Avanesian et al., 2021).

In Indonesia, COVID-19 has also had an impact on the education sector with the issuance of a circular letter from the Minister of Education and Culture of the Republic of Indonesia No. 3 of 2020 concerning the prevention of COVID-19, stating that education from early childhood, elementary, middle, and high school levels is encouraged to carry out learning activities at home (D. Saragih, 2021). This has caused all universities to strengthen online learning methods (Salas-Pilco et al., 2022).

The University of Indonesia has managed distance learning through the LMS since the end of 2004 to keep up with developments in science and technology in the world of education (Santoso et al., 2007; Sugiharto et al., 2023). Adapting to changes in learning methods requires students to be ready to receive learning (Resdasari Prasetyo et al., 2021). Especially for medical students who are required to have competence in the area of self-development in the form of lifelong learning. This is related to the rapid development of medical science and technology (Charokar & Dulloo, 2022).

According to the "Indonesian Doctor Competency Standards (SKDI)", the area of self-development requires doctors to have adult learning principles, one of which is independent learning, so the Faculty of Medicine, at University of Indonesia, changed its curriculum to the 2012 Faculty Curriculum, which has implemented a student-centered learning strategy (Widyawati et al., 2022).

One of the modules implemented according to the curriculum at the Faculty of Medicine, University of Indonesia, is the primary health care system (SPKP) module. The SPKP module was chosen because this module will be the basis of knowledge for implementing the pre-internship module in semester 10 or 11, which is needed so that students can apply knowledge about the national health system and primary health care system to patients and communities directly during field rotations in the pre-internship module later (Paramadhina, Shafira; Sugiharto, Agus; Friska, 2021), which of course requires readiness in the LMS.

Therefore, it is hoped that student readiness in taking the module can improve student achievement in the academic field. A study states that there is a positive correlation between good student readiness and learning achievement in the form of learning tasks (Allam et al., 2020; Ge et al., 2022). Research regarding student readiness

in online learning has also been carried out at the Open University (UT), with the results that there is a weak positive correlation between learning readiness and learning outcomes in the form of the Cumulative Achievement Index (GPA) (Ramli et al., 2018).

The difference with previous research, researchers will focus on students' LMS readiness with one exam evaluation method in the form of a summative exam, and there has been no previous research. This research aims to find out the relationship between the readiness of students who take the SPKP module and summative scores, and to provide practical recommendations to universities and lecturers in preparing students to achieve better academic grades and independent learning.

Methods

The design of this research is a cross-sectional design with a chi-square test to assess the relationship between LMS readiness and summative assessment. Data will be processed using the IBM SPSS for Windows version 26.0 application with a 95% confidence interval and a significance level of 0.05. The sample for this research was fourth-year students at the Faculty of Medicine at University of Indonesia. Questionnaire data collection was carried out on 2 August 2021 and 24 January 2022.

The number of samples collected by total sampling was 191 students, namely, students who took the SPKP module and were registered in the Next Generation Academic Information System (SIAK-NG). Students' readiness to study online through LMS is measured using the Online Learning Readiness Scale (OLRS) questionnaire, which has been tested for validity and reliability with a Cronbach's alpha value > 0.678.

This questionnaire consists of 5 dimensions of readiness (motivation to learn, self-directed learning, online communication self-efficacy, computer and internet self-efficacy, learner control) with 10 items question (Sugiharto et al., 2023).

The data distribution is not normal, so the median value is the cut-off that divides the readiness variable categories into ready (readiness value ≥ Median) and not ready (readiness value < Median). All of the procedures used in this study were approved by the health research ethics committee of the Faculty of Medicine at the University of Indonesia and the Cipto Mangunkusumo Hospital, with license numbers in recognition of their approval: No. KET-1184/UN2.F1/ETIK/PPM.00.02/2022.

Results

1. Participant Characteristics

The characteristics of student subjects from gender, age, student class, and student readiness are summarized in Table 1. The median age of respondents was 22 years, with the youngest age being 19 years and the oldest being 24 years. The student class is regular, namely 72.3%, and 64.4% female.

The median readiness value is 24, with a minimum score of 17 and a maximum of 29. Based on research results, fourth-year students at the Faculty of Medicine at University of Indonesia predominantly have good readiness in online learning, with a percentage of 51.3%.

Table 1. The participant characteristics

No	Variable	Total (N=191)				
		Frequency	Percentage	Median	Minimum	Maximum
1	Gender					
	Male	68	35.6			
	Female	123	64.4			
2	Age			22	19	24
3	Class					
	Regular	138	72.3			
	International	53	27.7			
4	Student readiness			24	17	29
	Ready	98	51.3			
	Not ready	93	48.7			

2. Readiness of Medical Students

In Table 2, the dimension of learning motivation, it can be concluded that 88.5% of medical students have a good score regarding the students' goals for taking the SPKP module as a lecture module for that semester, because it was immediately necessary for graduation. Furthermore, 64.9% of medical students consider feeling part of class very important, while only a small percentage (2.6%) considered it unimportant.

Table 2. Description of the readiness questionnaire item scores

No	Dimensions	Questionnaire Item	Total (N=191)	
			Frequency	Percentage
1	Motivation for learning	Q01. My need to take this course is:		
		1: Low – It's personal interest	2	1
		2: Moderate – I could take it later or substitute it with other modules	20	10,5
		3: High – I need it immediately for a degree	169	88,5
		Q02. Feeling that I am part of a class is:		
		1: Not particularly necessary for me	5	2,6
		2: Somewhat important to me	62	32,5
		3: Very important to me	124	64,9
2	Self-directed learning	Q03. I would classify myself as someone who:		
		1: Put things off until the last minute	25	13,1

No	Dimensions	Questionnaire Item	Total (N=191)	
			Frequency	Percentage
		2: Needs reminding to get things done on time	96	50,3
		3: Often get things done ahead of time	70	36,6
		Q04. Classroom discussion is:		
		1: Rarely helpful to me	9	4,7
		2: Sometimes helpful to me	102	53,4
		3: Almost always helpful to me	80	41,9
3	Online communication self-efficacy	Q05. When an instructor hands out directions for an assignment, I prefer:		
		1: Having the instructions explained to me	79	41,4
		2: Trying to follow the directions on my own, then asking for help as needed	104	54,5
		3: Figuring out the instructions myself	8	4,2
		Q06. I need faculty comments on my assignments:		
		1: Right away, or I get frustrated	19	9,9
		2: Within a few days, or I forget what I did	106	55,5
		3: Within a few weeks, so I can review what I did	66	34,6
4	Computer/internet self-efficacy	Q07. Considering my professional and personal schedule. The amount of time I have to work on a distance learning course is:		
		1: Less than for a class on campus	33	17,3
		2: The same as for a class on campus	105	55
		3: More than enough for a campus or a distance learning class	53	27,7
		Q08. When I am asked to use iPods, DVD players, Computers, or other technologies:		
		1: I put it off or try to avoid it	10	5,2
		2: I feel apprehensive, but I try anyway	53	27,7
		3: I look forward to learning new skills	128	67
5	Learner control	Q09. As a reader, I would classify myself as:		
		1: Slower than average	12	6,3
		2: Average – I sometimes need help to understand the text	117	61,3

3: Good – I usually understand the text without help	62	32,5
Q10. I have to go take exams or complete work:		
1: I will have difficulty getting on campus, even in the evenings and on weekends	37	19,4
2: I may miss some lab assignments or exam deadlines if campus labs are not open evenings and weekends	34	17,8
3: I can go to campus anytime	120	62,8

In the self-directed learning domain, 36.6% of medical students reported completing assignments early, 50.3% still needed reminders to complete assignments on time, and 13.1% tended to procrastinate until the deadline. Regarding class discussions, most medical students (53.4%) considered them sometimes helpful.

In the online communication self-efficacy domain, 54.5% of medical students preferred to try to understand instructions independently, while 41.4% still needed direct explanation from the instructor. Only a small percentage (4.2%) were completely confident in understanding instructions without assistance. Regarding instructor feedback, most respondents (55.5%) expected instructor comments within a few days, while 34.6% were still able to receive feedback within a few weeks.

In the computer/internet self-efficacy domain, 67% expressed enthusiasm for learning new technology skills, while only 5.2% tended to avoid using technology. Regarding time availability, 55% of medical students considered their time equivalent to face-to-face learning, while 27.7% felt they had more than enough time.

In the learner control domain, most medical students rated their reading ability at an average level (61.3%), while 32.5% felt they had good reading ability. Regarding access to campus for exams or assignments, 62.8% of medical students stated they could come to campus at any time, but nearly 37% faced access barriers, particularly outside of office hours.

3. Summative Value of The SPKP Module

All respondents passed the SPKP module and had summative scores categorized in Table 3. Summative scores are a form of learning evaluation in the form of MCQs. In the SPKP module, the summative grades are distributed from A- to C.

In general, medical students' scores were concentrated most in the B to C+ range. No medical students received an A (85-100) or lower grades of D (40-54) and E (0-39). The highest scores achieved by medical students were in the A- category (80-84) at 2.1%. The majority of medical students received a B- (65-69) at 31.4%.

Table 3. Summative value of the SPKP module

No	Variable	Total (N=191)	
	Summative value	Frequency	Percentage
1	A (85 -100)	0	0
2	A- (80 - 84)	4	2,1
3	B+ (75 - 79)	15	7,9
4	B (70 - 74)	50	26,2
5	B- (65 - 69)	60	31,4
6	C+ (60 - 64)	38	19,9
7	C (55 - 59)	24	12,6
8	D (40 - 54)	0	0
9	E (0 - 39)	0	0

4. The Relationship Readiness and Summative Grades

Variable relationships were assessed using the readiness value proportion test, which consists of ready and not ready for the summative value variable. The analysis was then carried out using the Chi-Square test, so that a P-value of 0.04 was obtained, which shows statistical significance in Table 4.

Table 4. Chi-Square test of student readiness for summative values

Variable	Summative value (N/%)						P-value
Student readiness	A-	B+	B	B-	C+	C	
Ready	4 (2,1%)	12 (6,3%)	21 (11%)	30 (15,7%)	17 (8,9%)	14 (7,3%)	0,04
Not ready	0 (0%)	3 (1,6%)	29 (15,2%)	30 (15,7%)	21 (5,2%)	10 (5,2%)	

Discussion

The median age of respondents was 22 years, with the youngest age being 19 years and the oldest being 24 years, with the student class being regular, namely 72.3%. Fourth-year students taking the 2021-2022 SPKP module were 64.4% female. This is following in the world, where more medical students are women (Morris et al., 2021). Research conducted on 3rd-level students at the Faculty of Medicine, University of Indonesia, in 2021 had the largest gender being female at 71.6%, with a median age of 21 years. The youngest respondent's age was 18 years, and the oldest was 22 years (Panjaitan, 2022). There are more female medical students; this is because women choose hospital medicine as their first choice of career sector. More female respondents identified patient care and community service opportunities as their primary career selection factors, while

males preferred research and teaching as their primary career selection factors (Snyder et al., 2021).

The fourth-year students at the Faculty of Medicine at University of Indonesia predominantly have good readiness in carrying out distance or online learning, with a percentage of 51.3%. This follows previous research, which stated that medical students were ready for E-learning (Chakraborty et al., 2021; Obi et al., 2018; Ossai et al., 2023), feel that it is easy to use E-learning, improves the quality of learning, increases satisfaction, and E-learning is more effective than traditional classroom approaches (Obi et al., 2018; Thepwongsa et al., 2021). Likewise, research conducted on Udayana University medical students, students fall into the ready category with the need to increase human resources, technological factors, self-development, and innovation (Wijaya et al., 2021). Medical students' readiness for E-learning shows the success of implementing e-learning and requires creating appropriate infrastructure, implementing the necessary standards, and taking steps to reduce existing barriers (Mokaripour et al., 2020). Implementing e-learning as blended learning using structured and interactive e-modules can provide more involvement during learning (Kumar et al., 2023).

Based on research results, overall, this study indicates that online learning readiness is in the good category, particularly in the domains of learning motivation and computer/internet self-efficacy. This is following research on medical students, which shows a picture of fairly high motivation (Delungahawatta et al., 2022; Ibrahim et al., 2021). This motivation is an important factor that enables students to complete assignments, achieve learning targets, and have self-confidence when learning takes place (Tempski et al., 2021). Motivation to study the module is high among students who can identify the benefits of the activities in the module, students who have the confidence to complete the module, and students who can tell how the module activities are going. Therefore, the SPKP module can explain the objectives of the material taught in the SPKP module, explain learning activities that are challenging for students, strengthen the relationship between theory and practice in the field, make learning a problem-solving task, and increase student self-efficacy during the module in progress. In addition, the formation of motivation in medical student education can be done through the use of modern multimedia, such as special websites or electronic journals, and the use of software in completing assignments (Shunkov et al., 2022). The technological barriers were not a major issue in the context of this study. However, time constraints for the same medical students still need to be considered in designing the learning load.

However, the results in the self-directed learning and online communication self-efficacy domains indicate that not all medical students are fully prepared for independent learning. Reliance on reminders, the need for prompt feedback from instructors, and a preference for direct explanations indicate that the instructor’s role as an active facilitator remains crucial, even in an online environment. This shows that students' ability to

express themselves through communication in online learning is still lacking. Students tend to choose to only accept the information provided by the module without finding out for themselves the instructions for learning the SPKP module. This is different from the research carried out by (S. Saragih et al., 2021), where the highest dimension is computer self-efficacy and the lowest is learner control. The millennial generation should be more active in communicating using technology and social media. Even the millennial generation now more often gets information through online communication (Ardi & Putri, 2020; Hopkins et al., 2018). Students can increase their efficacy and confidence in communicating online by actively participating in discussions through the LMS. Students can learn how to express themselves and their emotions through the cases given. Students can learn to give opinions, comment on other people's opinions, and provide suggestions and criticism either to other friends or to the module. Furthermore, the importance of feeling part of the class emphasizes that effective online learning must integrate collaborative learning strategies, such as synchronous discussions, interactive forums, and personalized feedback. Without these approaches, the risk of disengagement and decreased motivation remains, especially for medical students with lower self-directed learning.

Findings in the learner control domain also indicate that flexibility in evaluation systems and access are important factors. Online learning should not simply replace traditional media but also accommodate medical students' learning conditions holistically.

In the summative grades, the lowest grade obtained is A- at 2.1%, and the highest is B- at 31.4%. The difference in summative scores is caused by the level of difficulty of summative questions. Apart from that, there are non-academic factors that influence pre-clinical students' test scores, such as motivation (Žuljević & Buljan, 2022), socio-economic status (Rahman et al., 2023). Student characteristics and lifestyle (Fortes et al., 2022; Heidari et al., 2017). Learning outcomes are also influenced by many other factors, such as intelligence, learning methods, and talents. Students with good intelligence, scheduled study methods, appropriate study methods, adequate rest, and good time management will find it easy to undergo the learning process and have exam results that tend to improve (Valente et al., 2024).

The relationship between variables was proven with a p-value of 0.04 ($p<0.05$), which means that the relationship between student readiness regarding the learning management system and the summative score on the SPKP module is statistically significant. The students who are ready to receive the SPKP module learning with LMS have higher scores than students who are not ready. As many as 2.1% of students who were prepared had an A-, while none of the students who were not prepared got an A-. Likewise, with the B+ grade, the B+ grade obtained by students who were prepared was 6.3%, while those who were not prepared were 1.6%. Even though there were 15.7% of

students who were ready and not ready, they both got B+ grades. This is in line with research conducted on Open University students in 2019, which showed a weak positive correlation between online learning readiness and GPA scores. (Rohmah & Rizqan, 2021).

This shows that online learning readiness has become a determining factor in student learning success. Apart from that, it is also known that seventh-semester students have a higher level of readiness compared to other semesters because seventh-semester students are used to online learning, which demands independence in learning. Another factor that is assessed is the popularity of the study program, where popular study programs do not guarantee a high level of readiness and instead become low. This low level of readiness is caused by student heterogeneity (Rohmah & Rizqan, 2021). Apart from that, there is another study on the subject of students at SMAN 11 South Tangerang, which has a positive relationship with a significance of 0.004 between online learning readiness and chemistry learning outcomes. The percentage of students in the high category, namely 54%, tends to get high chemistry learning outcomes, namely 93% (Mawartiwi Devita & Bahriah, 2022). Learning outcomes are influenced by student readiness, where high learning outcomes are shown by student readiness in online learning. As explained by research conducted by (Gayef et al., 2023) In 2023, student learning success can be determined by many reasons, one of which is motivation, which consists of students' attention and willingness to learn.

Readiness is the initial stage in student learning because it requires understanding complex material. Students must be able to study independently, which is one of the factors that contribute to student readiness, especially in learning that uses a learning management system, so students are required to look for learning resources, study the material, and conclude the module material themselves. Therefore, it is hoped that this research will become a future suggestion for the Faculty of Medicine at University of Indonesia to increase the readiness of its students in the learning management system. New students at University of Indonesia have received OBM (Student Learning Orientation) at the start of their studies, but not specific to their respective faculties, especially medical students, who are required to learn throughout their lives.

Conclusion

According to the current study's findings, most participants were adequately equipped for online education. There is a significant relationship between the readiness learning management system and summative scores. Online learning can then be integrated by the university. Universities are strengthening technical readiness and digital literacy for all users, conducting technical system training at the beginning of the semester, and providing easily accessible interactive modules to support self-directed learning. Universities need to optimize network infrastructure and platform accessibility

to ensure that technical barriers do not hinder the learning process, which directly impacts academic achievement.

Future studies should go into detail on the efficacy of online teaching strategies utilized with students in different disciplines, and account for the possibility that socioeconomic conditions are one of the variables determining their level of LMS readiness.

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