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ORIGINAL ARTICLE

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The effect of online learning on student satisfaction in nursing education during the COVID-19 pandemic

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ABSTRACT

Introduction: Online learning is a global trend in higher education in the era of the COVID-19 pandemic. Online learning becomes one of the approaches available to most students and educators, as opposed to face-to-face learning. The aim of this research is to find out the correlation of online learning and satisfaction among nursing students during the COVID-19 pandemic.

Methods: This study was a cross-sectional approach involving 177 second-year nursing students randomly selected resulting in 121 students. Students filled out an online learning questionnaire consisting of 14 items and a satisfaction questionnaire consisting of 21 items from Google Forms. Data were analysed using logistic regression with level of significance (p=0.000).

Results: The online learning indicator that had the highest average value was relevance (3.12), while the highest average value of student satisfaction indicator was content (3.05). Logistic regression showed that the online learning indicator that greatly affected student satisfaction was attractiveness. Fair attractiveness for online learning increased satisfaction by 7.516 times compared to poor attractiveness (p = 0.000) and good attractiveness for online learning increased satisfaction by 55.538 times compared to poor attractiveness (p = 0.000).

Conclusions: Student satisfaction depends heavily on student attractiveness to the online learning process. Lecturers can increase the attractiveness of students toward online learning, whether through the utilized media, learning methods, or the technology of delivering lecture materials.

Keywords: COVID-19; nursing student; online learning; satisfaction

Introduction

The Coronavirus Disease (COVID-19) pandemic is disrupting education around the world and has led to a shift from face-to-face learning to online learning. Online learning is a very important new learning domain (Ghadrdoost *et al.*, 2021) and is becoming a global trend in higher education in the era of the COVID-19 pandemic. Online learning is one of the best approaches compared to traditional or mixed learning (Eltaybani, Abdelhalim and Abdelgawad, 2021); however, it must be refined and developed to replace or complement traditional education (Chakraborty *et al.*, 2021). Online learning is expected to be a way for students to achieve learning outcomes. Nursing students, as professional graduates, are expected to take quick professional decisions that should be based on scientific concepts (Das *et al.*, 2021). In fact, a previous study has shown that students are unable to learn well in online teaching compared to classroom teaching (Khobragade, Htoo and Soe, 2021).

Every educational institution desires to explore innovative online learning strategies with the aim of increasing satisfaction and engagement in learning. This is in accordance with Circular Number three and four of

2020 of the Indonesian Ministry of Education and Culture concerning the prevention of the COVID-19 and the implementation of education policies in the emergency period of the spread of the COVID-19. The Indonesian Ministry of Education and Culture noted that 94.73% universities in Indonesia conducted online learning which involved face-to-face interactions through online learning media such as WebEx, Zoom, or webinars (20.11%) and non-face-to-face interactions with social media (34.70%) (Aji *et al.*, 2020). In fact, various problems arose in the implementation of online learning. A survey by UNICEF found that 66% of students from different levels of education in 34 provinces showed that they were uncomfortable studying at home during the COVID-19 pandemic. Another evaluation by Directorate General of Higher Education of Indonesian Ministry of Education and Culture (DIKTI) showed that only 51% of lecturers and students had effective internet access to do online learning. Assessments on online learning have shown that as many as 92% of participants were hindered during the learning process.

Factors related to the effectiveness of online learning or distance learning include satisfaction, learning process, self-efficacy, use of technology, skills and experience, resources, interaction between educators and learners, and learning environments (hardware infrastructure, software, and networking) (Eltaybani and Abdelhalim, 2021). Online learning using interactive videos is most often used during learning. However, the process of interaction between lecturers and students is very rare. Communication is only carried out one way by the lecturer, so that the learning outcome is not achieved optimally. The findings of previous studies have suggested that high levels of interactivity in online education environments lead to greater levels of student satisfaction (Khobragade, Htoo and Soe, 2021). The satisfaction of students toward the course can be influenced by many factors, including teaching characteristics and student experience (Lengetti *et al.*, 2021). Online learning satisfaction will mediate the relationship between learning flow and learning outcomes during the COVID-19 pandemic (Eltaybani, Abdelhalim and Abdelgawad, 2021). Online learning provides easy access, is not limited by time and place, and can be used for more varied learning. However, in its implementation, not all students follow the learning well, for example, not listening to lecture materials, not being active during the lecture process, and so on. This learning process will affect student satisfaction. Student satisfaction and the factors that influence it during online learning have not been explained. The aim of this research was to find out the correlation between online learning and study satisfaction among nursing students during the COVID-19 pandemic.

Materials and Methods

This study was cross-sectional and conducted at one private university in Lamongan City from February to March 2021. Samples were taken with proportional random sampling. Students who met the inclusion criteria were willing to be research respondents and were second level nursing students in 2021 having experience following offline learning for 1 year, and online learning for 1 year. These students have undergone a phase of change from offline to online learning, so researchers get a clearer picture of student satisfaction variables than students who only get online learning. The sample was calculated based on the number of students who met the inclusion criteria and obtained 121 students. Researchers wrote the names of the students of each class, then drew lots until the number reached the proportion of the previously calculated classes A, B, and C. Students received an email invitation to an online self-assigned questionnaire. This research has been declared ethically based on No. 115/EC/KEPK-S2/02/2021 by The Ethical Committee Medical Research, University of Muhammadiyah Lamongan.

Demographic data consisting of age and gender were entered in the first part of the form. In the second part, questionnaires to measure online learning (14 items) and satisfaction (21 items) were adopted from the Prasetya and Harjanto (2020). The terms of the questionnaire assessment utilized the Likert scale: 4=Strongly Agree, 3=Agree, 2=Disagree, 1=Strongly Disagree. Online learning variable data were analyzed using a total score on each indicator, which included indicators of relevance, attractiveness, effectiveness, efficiency, and productivity. Each indicator was categorized into poor, fair, and good. The student satisfaction questionnaire was also declared valid on all items with $r > 0.3494$. The satisfaction questionnaire was also found to have high reliability (Cronbach's alpha 0.758). Descriptive analysis of satisfaction variable used total score on each indicator, which included indicators of content, accuracy, form, ease of use, and consistency. Each indicator was categorized into poor, fair, and good. In inferential analysis, the total scores of all indicators are categorized into two, satisfied and dissatisfied. All items on the online learning questionnaire had an r value > 0.349 and thus it was declared valid. The online learning

Table 1 Descriptive statistics of the online learning and students' satisfaction

Scale	Subscale	Number of items	Mean ±SD	Minimum	Maximum
Online learning	Relevance	2	3.12±0.43	2	4
	Attractiveness	3	2.64±0.55	1	4
	Effectivity	3	2.39±0.57	1	4
	Efficiency	2	2.62±0.62	1	4
	Productivity	4	2.88±0.47	1.25	4
Student satisfaction	Content	3	3.05±0.43	2.33	4
	Accuracy	3	2.91±0.51	1.33	4
	Form	4	2.82±0.36	1.25	4
	Easy to use	8	2.69±0.39	1.55	4
	Consistency	3	2.94±0.31	2	4

questionnaire was found to have high reliability (Cronbach's alpha 0.758). The data were analyzed using several stages. Univariate analysis uses mean values and standard deviations to find out the indicators of the two most dominant variables. After that, the data were analyzed using chi square, to filter out some indicators that had no correlation with learning satisfaction. Several indicators that had a correlation were then subject to multivariate tests, including logistic regression, to find out the indicators that have the most influence on learning satisfaction.

Results

Univariate Analysis

Of the 121 respondents, 79% were female, while 54% were students of 20-21 years of age, with the rest were 18-19 years old. Table 1 shows that of the five online learning indicators, the indicator of relevance had the highest average value (3.05±0.43). Relevance means the implementation of online learning has learning conformity and is related to the science and needs of the student environment. The indicator that had the lowest average was effectivity (2.39±0.57). Online learning is considered poor on the indicator of effectivity; the interpretation is that the learning can only be understood and kept in mind by students for a short time. Satisfaction with the content indicator means that syllabuses, materials, assignment announcements, and assessments were in accordance with the needs of students.

Bivariate Analysis

The chi square test was utilized to select the variables that were to be included in multivariate analysis. Table 2 shows that the variables of relevance (p = 0.000), attractiveness (p = 0.000), affectivity (p = 0.130), efficiency (p = 0.010), and productivity (p = 0.005) met the requirements for a logistic regression test (p < 0.250).

Multivariate Analysis

A logistic regression test was performed on the five online learning indicators to find out the ones that most affect the satisfaction variable. Logistic regression was used the enter method. Indicators with p>0.1 were gradually removed from the largest value. In the first model, the relevance indicator was removed from the model to make the model fit. Then the indicators of productivity, efficiency, and effectiveness were removed gradually based on the largest P value.

The results of the logistic regression test showed that only the attractiveness indicator could fit into the model. The OR interpretation in Table 3 shows that fair attractiveness for online learning increased satisfaction by 7.516 times compared to poor attractiveness (p = 0.000). Good attractiveness for online learning increased satisfaction by 55.538 times compared to poor attractiveness (p = 0.000).

The model also shows that the variation in satisfaction can be explained by the attractiveness indicator, by 38.3%. The accuracy of the satisfaction model above is 76.9%.

Discussions

The relevance of online learning is the aspect of online learning that is considered the best by students. High relevance shows that online learning is in accordance with the science and needs of students. The

Table 2 Chi-Square Analysis the online learning and students' satisfaction

Online Learning	Satisfaction			P
	Dissatisfied	Satisfied	∑	
Relevance				0.000
Poor	4	0	4	
Fair	62	30	92	
Good	2	23	25	
Attractiveness				0.000
Poor	19	1	20	
Fair	36	14	50	
Good	13	38	51	
Effectivity				0.130
Poor	10	6	16	
Fair	32	17	49	
Good	26	30	56	
Efficiency				0.012
Poor	11	1	12	
Fair	25	16	41	
Good	32	36	68	
Productivity				0.005
Poor	9	1	10	
Fair	19	7	26	
Good	40	45	85	

Table 3 Regression logistic analysis of predictor of students' satisfaction

Subscale	B(SE)	OR	95% CI of OR	Significance
Attractiveness				
Poor				0.000
Fair	2.017(0.450)	7.516	3.112-18.155	0.000
Good	4.017(1.075)	55.538	6.752-456.807	0.000

learning material must be delivered in a clear, well-organized, and easily accessible manner to the student, wherever the student may be (Kuo, 2010). The learning process is carried out with a focus on learning achievement and periodic evaluations in the learning process to maintain good quality learning even through online learning (not face-to-face). Self-evaluation and peer evaluation can be a way to receive student feedback as well as a reflection of learning success (Ghaljeh, Rezaee and Arbabisarjou, 2021). In addition, learning evaluation can also be done by conducting final exams or student skill exams both individually and in groups (Chan *et al.*, 2021). The online learning process must be able to achieve learning outcomes. The material submitted must be organized in accordance with the existing curriculum and a clear evaluation process, so that the implementation of online learning does not reduce the quality of graduates.

The productivity indicator also had a high mean value compared to the other indicators. This means that online learning is considered good in productivity and able to encourage students for a more active role than offline learning. Previous research explains that increasing the active participation of students can be done using collaborative learning methods and case approaches because there will be interaction between facilitators and between students (Khan *et al.*, 2017). An active learning environment with a high level of interactivity between students and their environment (peers, instructors, and content) not only motivates students, but also improves overall learning achievement and satisfaction (Croxton, 2014). Good interaction between lecturers and students during learning can also increase satisfaction (Eltaybani, Abdelhalim and Abdelgawad, 2021). Lack of communication between students and lecturers, as well as low motivation, can be obstacles to online learning. Good interaction between lecturers and students during the learning process will increase student participation in the learning process from beginning to end, so that learning materials can be delivered properly.

The content indicator had the highest average value for the satisfaction variable. Content has significance in the learning materials and during the learning process. Learning is carried out in accordance with the syllabus that has been composed. In learning about nursing, students are trained to develop critical thinking to solve problems of patients and take decisions for nursing interventions in the middle of collaborative learning (Nasirzadeh *et al.*, 2021). The abilities of facilitators and rapid response when students have learning difficulties can also affect student satisfaction (Qowi, Lestari and Sholikhah, 2016). Interaction with students, preparation of learning resources, and passion for teaching are significant factors with online learning. The utilized learning methods are also one of the triggers of a good learning process. The online learning process has a good impact for faculty to develop lecturers' skills and self-efficacy in online learning (Li *et al.*, 2021). The suitability of the material with the syllabus is very helpful for students to find learning materials during online learning (Culp-Roche *et al.*, 2021). The use of varied learning methods and media can also make it easier for students to receive the material delivered. Learning media based on online simulation can facilitate the accessibility of learning materials, as well as increase the knowledge and skills of nursing students (Kim and Park, 2021) and increase student involvement during lectures (Chan *et al.*, 2021). Collaborative learning can be implemented through PowerPoint presentation activities, short videos, quizzes, and provision of feedback in each assignment (Joseph *et al.*, 2021).

Regression test results showed that the attractiveness indicator most affected student satisfaction in online learning. Students will be satisfied during courses that are perceived as interesting. Based on previous studies, online learning has a good relationship with student satisfaction levels (Baherimoghadam *et al.*, 2021). The learning process can be made to be more interesting with multimedia technology, including mobile technology, in order that learners can more actively participate in the educational process. The online learning process is also more effective when the syllabus is structured clearly, with usage of audio-visual media such as videos, images, posters, and so on (Turrise, Thompson and Hepler, 2020). Learning media that create interest, as well as collaborative learning methods, can reduce student frustration (Khobragade, Htoo and Soe, 2021). An interesting and fun learning process will increase students' interest in participating in online learning. Students will be excited because the learning process is not monotonous.

A fun learning process will make students attracted to listen to every process in learning. Students of

Generation Z who are often exposed to technology can easily adapt to changes related to technology (Baghchegh 2021). Usage of mobile technology during the learning process is also the choice of students in following the learning process. The usage of mobile technology in learning (applications about diseases, physical examinations, drugs, video and audio in medical simulations, and various games), can facilitate the learning process in health students (Huwaidi *et al.*, 2021). Online learning provides a challenge for lecturers to update the latest technology in learning. Lecturers must understand varied learning media such as using puzzles, quizzes, animated videos that students prefer compared to listening to courses.

Online learning is facilitated through several common platforms such as Zoom Meetings, Google Meet, Edmodo, Google Classroom, and applications developed by universities, which can be a fun learning medium for students. WhatsApp application is the online learning platform that students are most interested in. Microsoft Teams, Zoom, and Google Classroom also provide technology features as an online learning medium (Eltaybani, Abdelhalim and Abdelgawad, 2021). Research related to learning media and learning methods that can attract students to follow the learning process can be conducted in the future (Almaiah, Al-khasawneh and Althunibat, 2020). However, inadequate lecturer skills during the online learning process, time constraints, and inadequate infrastructure can be obstacles during online learning (Khobragade, Htoo and Soe, 2021). An obstacle that often occurs is internal constraints. Technology and media, including the Internet, have a broad role in education and health education (Huwaidi *et al.*, 2021). The constraints of unstable Internet networks are experienced by facilitators and learners. Learning methods and mediaare utilized to increase student interest in following learning. However, there are several matters that need to be considered in order that students can achieve competency standards in the online learning process, such as readiness in technology, material readiness, and positive attitude during online learning (Chakraborty *et al.*, 2021). Barriers to the implementation of online learning, such as changes in management problems, technical problems with online learning systems, and financial problems, must also be minimized so that the learning process runs optimally (Hunt, 2018). The institutions also must provide facilities that support online learning. The obstacles that occur during online learning will reduce motivation, both for lecturers and students, in carrying out online learning itself. The limitation of this study is that the research is carried out with a sample from one institution only, so it cannot be generalized in all nursing educational institutions.

Conclusions

Based on the results of this study, it was revealed that attractiveness is a very important factor in online learning. Attractive learning can increase students' active participation during the learning process, and in the long term can have a positive impact on learning outcomes. Various efforts to increase student interest in learning are by modifying learning media, learning methods, and improving the skills of lecturers in conducting online learning. Future research can be carried out related to the media and methods used during online learning and their correlation with student motivation and satisfaction.

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