

# Predictive Factors of Students Engagement Online Learning for First Semester Faculty of Medicine UNISSULA Preclinical Students

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## ABSTRACT

**Background:** the outbreak of COVID-19 pandemic causes havoc among many aspects of life including education. In Indonesia, 8 months since the first outbreak the mode of teaching have shifted from face to face problem based learning to online learning. The year 2020 preclinical students are the first batch students who undergo full online learning this semester due to the pandemic. **Aims and objectives:** This study aims to investigate the students engagement and willingness during online classes. **Materials and methods:** questionnaire items were developed based on aspects of problem based learning which include small group discussion, skill laboratory, practicum, lecture and online examination. The responses were based on 5 points Likert scale to rank the engagement, willingness of online learning and also the students understanding on the indicators as well as open responses to record their opinions on online learning. All the 2020 preclinical students (N=151) were given informed consent to participate in the study and were voluntarily participated afterwards. Multinomial regression analysis was conducted. **Results:** The logistic regression model was statistically significant  $X^2(12, N=151) = 33.94 = .27, p < 0.001$ . The model explained 27% (Nagelkerke  $R^2$ ) of the variance in student engagement and correctly classified 70.9% correct prediction. Highly engage students was associated in likelihood of participating during small group discussion and practicum sessions.

**Keywords:** COVID19, students engagement, online learning; first semester preclinical students.

## 1. INTRODUCTION

The sudden outbreak of COVID19 in December 2019 which later triggered global pandemic have shifted many aspect of life. One of the aspects of life affected by the pandemic is medical education which must pivot the traditional face-to-face classroom interaction to online learnings[1]. The sudden transition involves familiarizing with technology used for teaching and learning. Previously, students were familiar for finding references they need for lectures, but now all lectures, practicum, small group discussion to examinations are held online. The faculties also adapting with these new transitions by using various innovative strategies to make sure that the medical education for students runs smoothly by blending the pre-clinical curriculum with integration of knowledge and skills in training future medical doctors [2].

The so called technology gaps between students and lecturers/ professors also contribute in the process of online learning. The first year preclinical students referred as Generation Z medical students are more exposed to technology in terms of they are more frequently connected online whether it is for social media or educational purposes, and as for the lecturers and professors are more perceiving web based media as unsuitable for learning tools [3].

Online learning is defined as synchronous or asynchronous. The synchronous online learning means that the technology allows the real interaction between the instructor/ lecturer/ professor with students by using video conferencing platforms which enables the online classroom through the interaction, whilst the asynchronous means that there is significant delays in delivering the teaching materials for instance the pre

recorded lectures, video recording on certain procedures, emails, uploading assignments or class materials to cloud storage for the students assignments[4,5]

Preclinical students refers to the students of faculty of medicine during their 3,5- 4 years courses to learn basic sciences of medicine. The basic sciences of medicine are compiled in preclinical curriculum using problem based learning which allows students to experience medical problems in small group discussions, team based learning and series of expert lectures which allows them to engage more to the subjects.

The current pandemic makes the transition for learning from on campus to off campus due to preventive cautions of the pandemic results in many aspects of students live includes isolation, stress, lacks of concentration, reduced interaction with peers, disturbances caused by family or home environment [2,4,6].

The changing learning environmental due to the pandemic have developed further strategies in keeping up with delivering lectures and utilize the innovative technologies to shape students learning. The online learning requires self disciplines and initiative from the students, whilst the faculty members are challenged to provide course materials to increase students engagement.

The purpose of the research presented in this article is to explore whether the first year preclinical students engagements is effected by online learning.

### 1.1 Students Engagement

Student engagement is initially defined as physical and mental energy, being situation-specific which includes quantitative and qualitative components for learning. This definition then updated by which student engagement as being significantly strengthened through academic involvement, involvement with faculty and with students peer groups[7,8]. These definitions constructing learning engagement in keys area of behavioral, emotional, and cognitive engagement. Behaviour engagement refers to involvement of students when they are participating in activities such as assignments, emotional engagement means the students affective attitudes towards peers, instructors and also the courses in general, while cognitive engagement refers to students evaluating courses content as important and relevant[8].

The student engagement and use of technology have positive relationship especially engagement behaviors such as dedication, participation and learning interests [9]. However, in the pandemic situation, the engagement is not immune to external disruptions due to the pandemic family stressors such as worries, home schooling, health

based anxieties can contribute to the challenges of student engagement [10].

## 2. METHODS

### 2.1 Participants

Participants were purposely selected only for first year medical students which enrolled as faculty of medicine UNISSULA year 2020 (Female= 102, Male= 49). Students attendance sheet was used as participants frame even though the participation is voluntary. The class leader were contacted and given the link to fill out the online questionnaire.

### 2.2 Procedure

The students were voluntarily participated, and their anonymity is guaranteed from the informed consent in the beginning of the online questionnaire. The online questionnaire's link was given to the class leader and being shared from October 2020 to January 2021. The ethical clearance obtained from Bioethical Committee for Research in Medicine/ Health Science Faculty of Medicine Unissula Number 369/XI/2020/Komisi Bioetik.

### 2.3 Questionnaire

The questionnaire was develop to assess [1] students engagement [2] online learning. The response options of the questionnaire based from 5 Likert-type scales from (1=strongly disagree to 5 strongly agree) for positive responses and for negative responses ranging from (1= strongly agree to 5 strongly disagree). There are also questions on students experience in joining online learning, current situation on covid19 in Indonesia, resources to conduct online learning (financial supports, internet connection). The overall reliability of the questionnaire used was  $\alpha = 0.90$ .

### 2.4 Data Analysis

The internal consistency reliability questionnaire was measured using Cronbach's alpha. Descriptive statistics were conducted to illustrate the demographic characteristics of the sample as well as their use of online resources. Multinomial regression analyses were performed to identify the predictors of students engagement during online learning.

## 3. RESULTS

### 3.1 General Information.

The total 151 out of 197 first year preclinical students of Faculty of Medicine students participated in the study. The response rate were 76.7%. Most of the participants were female (67.5%).

Cronbach's alpha for the questionnaire was  $\alpha = 0.90$ . The characteristics of the subjects is illustrated in Table 1 along with their responses on online learning. There were 112 students (74.8%) have never experienced distanced learning related to the courses that they are currently taking, and 25% of them took online classes supplementing their current courses.

Table 1. General Information of Participants (N=151)

Variables	N (%)	Mean	Standard Deviation
Gender			
Male	49 (32.5%)	1.32	0.47
Female	102 (67.5%)		
Covid19 situation		3.99	0.906
Very unthreatening	3 (2%)		
Not threatening	4(2.6%)		
threatening	32(21.2%)		
Very threatening	43(42.4%)		
Severely threatening	48(31.8%)		
Experience on online distance learning before			
No	107 (70.9%)		
Yes	44( 29.1%)		
Taking supplementary online classes			
No	112(74.8%)		
Yes	38 (25.2%)		
Feelings when classes are held online			
sad	28(18.5%)		
anxious	53(35.1%)		
No difference	51(33.8%)		
relaxed	15(9.9%)		
happy	4 (2.6%)		

Main connection for online classes			
House wifi	109 (72.2%)		
Data plan from network operators	35 (23.2%)		
Public hotspots	7 (4.6%)		

Table 2 Students online learning engagement measures and distribution (N=151)

Scales	Mean (SD) Possible Range	Moderate Engagement	High Engagement
Total Learning Engagement	2.59 (0.49)	61(40.4%)	90 (59.6%)
Participation Engagement	13.78(3.47) 20	65 (43.05%)	86(56.95%)
Challenges	11.78(2.93) 16	51(33.77%)	100(66.23%)
Effectivity	29.79(7.40) 40	64(42.38%)	87(57.62%)
Perception on Lecturer	20.89(3.95) 16	56(37.08%)	95(62.92%)

The students engagements components were constructed with multiple statements and rated on five point Likert scales, with responses from strongly disagree to strongly agree.

A multinomial regression was performed to model the relationship between predictors in 2 groups (moderate engagement and high engagement). The traditional 0.05 criterion of statistical significance was employed to all tests.

Addition of the predictors to a model that contained only the intercepts significantly proved the fit between

model and data  $X^2$  (12, N=151)= 33.94, Nagelkerke  $R^2$ = .27,  $p < 0.001$ .

Significant unique contributors were made by predictors as illustrated in table 3,

*Table 3 Predictors Unique Contributions in the Multinomial Logistic Regression (N=151)*

Predictors	$X^2$	df	p
Gender	0.081	1	0.776
Previous experience of online learning	0.661	1	0.416
Supplementary online class	0.154	1	.695
Motivation	0.761	1	0.383
Effectivity	0.191	1	0.662
Participation during small group discussion	12.086	1	0.001**
Participation during practicum	6.399	1	0.011**
Participation during skills laboratory	2.306	1	0.129
Participation during online lecture	0.092	1	0.762
Challenges	0.502	1	0.479

The reference group was students with moderate engagement and high engagement. Accordingly, each predictor has two parameters one for predicting whether the subject is in the moderate engagement group or in high engagement group.

To facilitate the interpretation of differences between the predictors, each of the predictor variables had been standardized to mean 0. The parameter estimates are illustrated in table 4

*Table 4 Parameter Estimates (N=151)*

Parameter	B	Wald	Exp(B)	p
Gender	-.120	9.929	.887	.776
Previous experience of online learning	-.362	.655	.696	.418
Supplementary online class	-.179	.153	.836	.695
Motivation	.506	.751	1.659	.695
Effectivity	-.195	.191	.823	.662
Participation during small group discussion	-1.414	11.175	.243	0.001**
Participation during practicum	-1.054	6.153	.349	.013**
Participation during skills laboratory	-.068	2.193	.934	.139
Participation during online lecture	.145	.092	1.156	.762
Challenges	-.298	.496	.742	.481

There are two predictors which had significant parameters for comparing the students engagement groups which are participation during small group discussion and participation during practicum.

Using the logistic model to make such prediction results in 70.9% correct prediction. Correct predictions were more frequent for the high engagement students (77.8%) compared to moderate engagement students (60.7%).

#### 4. DISCUSSION

The results suggested that the higher the students engagement was associated with the likelihood of participating during small group discussions and practicum sessions. There are no low engagement

students reported in this study. The participants are adapting well during their online classes, but surely looking forward for face to face interaction for procedural skills. The participants can manage the technological integration into learning and during the online learning due to the pandemic they are more exposed to the global learning of opportunities which consists of problem solving, and enables for independent learnings[11].

Small group discussion potentially offers learning environment where students can become self directed learners and enables them to collaborating with other group members to achieve both individual and group learning objectives[12]. Participation during practicum also become one of the predictors of high students engagement. Practicum plays important role in preparing medical students to be agentic learners because practicum is one of deliberate activities to assist with their learning[13]. However, due to the pandemic challenge, students are triggered to adapt and proved that they can overcome the setbacks due to the closure of classroom learning during the pandemic by participating in online classes and discussion.

One of the limitation of this study was when the students have some questions regarding the questionnaire they often ask their peers instead of the researcher. Based on their feedbacks they feel happy about online learning but they want the hands on experience for the procedural skills and knowledge. They are also noted that meeting friends and lecturers online make them happy and looking forward for each online classes, while some of them said that online classes causes backpain, and other vision related problems.

## 5. CONCLUSION

The covid19 pandemic has impacted medical education globally and disrupted many medical institutions which make them to switch modes of learning from on site learning to online learning. The students and the faculty are also obliged to learn and adapt to these changes. The use of online learning received positive responses since the preclinical medical curriculum is introducing the novel methods of delivering education online

We never know when the pandemic will end, therefore, further preparedness will help students and faculty to take actions during this difficult time.

By adapting to the online learning, the first year preclinical students are still able to become agentic learners with the guidance from the faculty.

## AUTHORS' CONTRIBUTIONS

All authors have contributed, designed and approved the study.

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