



Forced Shifting to e-Learning during the COVID-19 Outbreak: Information Quality, System Quality, Service Quality, and Goal Orientation influence to e-Learning Satisfaction and Perceived Performance

Diena Dwidienawati^{1*}, Sri Bramatoro Abdinagoro², David Tjahjana³, Dyah Gandasari⁴, Munawaroh⁵

¹Binus Business School, Bina Nusantara University, Indonesia, diena.tjiptadi@gmail.com

² Binus Business School, Bina Nusantara University, abdinagoro@yahoo.com

³Universitas Multimedia Nusantara, Indonesia, davidtjdd@gmail.com

⁴POLBANTAN Bogor, Indonesia, dyah.gandasari@gmail.com

⁵Swiss German University, Indonesia, munawaroh.zainal@gmail.com

ABSTRACT

The COVID-19 pandemic outbreak is not only affecting human health, but it is also affecting other aspects of human life, including the education sector. In many countries, the recommendation of health authorities forced the education sector to find an alternative of face-to-face session method. The distance learning method may be the best option for students in a forced situation. Even though e-learning is a hot topic, e-learning is still more of a supplement to education in normal conditions. This study wants to see the factors influencing e-learning satisfaction and performance to respondents who are forced to join e-learning due to the COVID-19 pandemic. A descriptive quantitative study using a structured questionnaire as the instrument was conducted to University Students at 4 campuses in Greater Jakarta, Indonesia. They were asked to self-rate the goal orientation, perceived ease of use, service quality, information quality, e-learning satisfaction, and perceived performance. One hundred fifty-three questionnaires were analyzed with SEM LISREL. The finding of the study shows that perceived ease of use (PEOU) and service quality have significant positive impacts on e-learning satisfaction, but not goal orientation and information quality. E-learning satisfaction positively influences to perceived performance. This study contributes to D&M IS Success Model and e-learning body of evidence. This study also contributes to e-learning practice.

Key words: COVID-19, e-learning, satisfaction, quality

1. INTRODUCTION

By the end of 2019, Coronavirus (COVID-19) is starting to spread worldwide rapidly and become a pandemic. This largescale pandemic outbreak is not only affecting human health, but it is also affecting other aspects of human life, including the education sector [1]. In many countries, the recommendation of health authorities forced the education sector to find an alternative to the face-to-face method. In the case of disruption, the learning process should be undisrupted [1]

The smooth and easy alternative is to change from face-to-face lectures to online meetings. The distance learning method may be the best option for students in a forced situation [2]. This pandemic has unintentionally increased the awareness and adoption of technology in education that currently available [3]. In other to do that, [1] further argue that the e-learning process should have “(a) reliable communication infrastructure, (b) suitable digital learning resources, (c) friendly learning tools, (d) effective learning methods, (e) instructional organizations, (f) effective support services for teachers and learners, and, (g) close cooperation between Governments, Enterprises and Schools (G-E-S cooperation)”.

With the advancement of technology, e-learning, as a new method in teaching, is gradually used in education at all levels. E-learning has become more popular now. A survey in the US in 2015 showed that the number of students taking online classes is increasing from 3,7% to 3,9%. One in four students takes one online course in one year at least. Sixty percent of academic leaders consider that e-learning will be important for long term growth [4].

Even though e-learning is a hot topic, e-learning is still more of a supplement to education [5]. Previous studies have revealed antecedents of e-learning satisfaction and intention. Service quality, information system, method of delivery, content, perceived ease of use (PEOU), intention to e-learning have been known to be determinants of e-learning satisfaction. However, most of the previous studies have been conducted to respondents who initially have an intention to e-learning. This study wants to see the factors influencing e-learning satisfaction and performance to respondents who are forced to join e-learning due to the COVID-19 pandemic.

2. LITERATURE REVIEW

2.1. E-learning

With the advancement of technology, e-learning, as a new method in teaching, is gradually used in education at all

levels. E-learning has become more popular now. A survey in the US in 2015 showed that the number of students taking online classes is increasing from 3.7% to 3.9%. One in four students takes at least one online course in one year. Sixty percent of academic leaders consider that e-learning will be important for long term growth [4].

However, even though e-learning is a hot topic, e-learning is still more of a supplement to education [5]. That regardless the available studies proved that e-learning is effective. There are insignificant differences in course scores, student engagement and student satisfaction between online and offline learning methods [6]. This claim is proven by the majority of academic research [4]. Previous study event shows that online course sometimes be more effective [7]

E-learning offers advantages efficiency, flexibility and convenience [4]. However, studies show that interaction and communication between students and teachers are important factors for student engagement and performance. One of the most important factors of student perceived learning and e-learning satisfaction is student-instructor interaction [8]. Timely response and feedback also increased satisfaction [9]. E-learning lacks those factors compared to the offline method. Therefore, interaction and responsiveness play important role in e-learning satisfaction..

Previous studies have revealed the other determinants of e-learning satisfaction and intention. Determinants such as information quality, method of delivery, content, PEOU, intention to e-learning and self-regulated have been known to be influencing factors of e-learning satisfaction.

This study is based on the model of IS success based on [10], [11] Information System (IS) success can be evaluated in combination with information, system, and services Quality. System quality will be based on TAM. In the adoption of technology, the Technology acceptance model (TAM) provides an understanding of how users accept and use the new technology based on their internal beliefs [12]. Two factors are perceived usefulness (PU) and perceived ease of use (PEOU). However, more research of TAM reveals that PEOU is a stronger predictor of system usage [4]. Service quality will be based on the discrepancy theory. The Discrepancy theory describes the deviation of a situation from the state one would like it to be in. This theory is based on the model of satisfaction research where the judgment of the performance is referred to as a referent [13].

2.2. Goal Orientation

In the face of challenge or crisis, what people need is not extrinsic powers. People need more intrinsic power which comes from within in other to survive. COVID-19 pandemic has shaken up everybody's life. The intrinsic power helps people to develop a solution and empower people to manage the change [14].

Regular students are forced to change their study methods from face-to-face lectures to e-learning methods. Students are forced to become autonomous, strategic and focus on their education goals. Therefore, to be successful in e-learning self-regulated is key [15]. One of the aspects of self-regulation is goal orientation. Goal orientation means that people can direct their motivation toward valuable goals [15]. Goal orientation can be defined as the intention of an individual on the reasons and how to approach and participate in a certain learning activity [16].

[16] state that learning outcome is influenced by content, system quality, self-motivation, and self-efficacy. They also claim intrinsic and extrinsic motivation is positively influencing satisfaction. [16] state that goal orientation is one of the important determinants which can predict learning achievement. [16] has shown that goal orientation has an impact on satisfaction mediated by participation. They also further proved that satisfaction has a positive impact to study performance.

2.3. Perceived Ease of use (PEOU)

Technology Acceptance Model theory (TAM) is an information system theory which explains how the uses accept and use new technology. TAM claims that when users are introduced to new technology, there are two factors will influence users' decision about how and when they will use it. Those two factors are Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) [17]. TAM Introduce by [12] is the adoption of TRA specifically. TAM is rooted in TRA (Theory of Reasoned Action) (Theory of Reasoned Action). “*TRA is widely studied model from social psychology which is concerned with the determinant of consciously intended behaviour*” [18].

IT has been widely used to improve productivity and performance. One of the important component factors that influence the customer intention in adapting the technology is system quality [19]–[22]. The definition of system quality is the system functions integration and system operation reliability based on the perception of users [21]. [19] state that system quality involves ease of use, reliability of the system, quality, and quality of documentation, user interface consistency, and maintainability of the program.

Previous studies show that perceived system quality is known antecedents of as satisfaction [19], [23]. [24] has specifically claimed that both perceived of usefulness and ease of use influence e-learning satisfaction. However, the degree of perceived ease of use is higher than perceived of usefulness. This might due to the concept of usefulness is not well accurately reflected in the students' perception [24]. Therefore, this study will only measure the perceived ease of use.

2.4. Information Quality

Providing customers with high-quality information is an important factor for the success of an online business. The most common measures for information quality are accuracy, currency, completeness, understandably and timeliness [25]. [11] argue that the desirable of information characteristics should me accuracy, completeness, consistency, precision, or relevance. There are four important quadrants of information quality which are model-sound, dependable, useful and usable [26]. In this study, the measures of IS will be accuracy, timeliness, relevant and precision.

[25] in their study reveal the implication of information quality, e-satisfaction, e-trust, and customer commitment. They further claim that information quality has a positive influence on e-satisfaction. [27] also have proved that information quality as part of overall quality has a positive impact on satisfaction. Contextual and representational information quality is also proved as an antecedent of user satisfaction [28].

2.5. Service Quality

Service quality has been a prominent concept of the antecedent of satisfaction. Satisfaction is influenced by how an organization as the provider of service delivers the RATER [29]. RATER consist of first is reliable. Reliability is about how an organization delivers the agreed services consistently, accurately and on time. “A” is from assurance which is about the ability of the employee to communicate their knowledge convincingly to customers. The third is tangible. Tangible talks about the physical aspect of the service “T” is from is empathy. Does the employee have the ability to offer empathy and attention to the customer? The last is the responsiveness. It is about how responsive the organization to the inquiries of the customer.

Previous studies show that service quality also positively influence student satisfaction in e-learning setting [30]–[34]. In this study, because this is an online setting, the focus will be only for reliability and responsiveness.

2.6. Satisfaction

The marketing literature sees consumer satisfaction as a consequence as a result of the post-consumption experience. At present, the most prominent concept of consumer satisfaction is disconfirmation. Satisfaction is defined as “the consumer’s fulfillment response” a post-consumption judgment by the consumer that a service provides a pleasing level of consumption-related fulfillment, including under- or over-fulfillment” [13]. [35] define satisfaction as a positive affective response from consumer to relationship exchange.

Consumer satisfaction is the essence of marketing theory and practice [36]. It is understood that customer retention maybe offers better profitability than attracting new ones. It is also known that customers who are not satisfied may cause unfavorable behavior intentions. That includes negative word of mouth, giving less business or switching to other service providers [37].

Satisfaction has been considered as key in assessing the successful e-learning [38]. In e-learning, satisfaction has a close relationship with the success of teaching and course quality [39] claim that satisfaction has a positive significant impact on the organizational result. [39] also claim that satisfaction influences performance.

2.7. Performance

The most common measured variable of learning outcomes is learner satisfaction. Besides satisfaction, other important learning outcomes are learning achievement [16].

Performance effect is defined as *“the degree to which system use raises the quality of work by aiding to accomplish the task rapidly, enables command overwork, enhances job performance, weeds out mistakes and propels efficiency at work”* [27].

Learning performance is influenced by self-regulated, learning environment, information quality, system quality and service quality mediated by satisfaction [16], [27].

The hypotheses of this study are:

H1: A positive and significant relationship exists between goal orientation and satisfaction

H2: A positive and significant relationship exists between perceived ease of use and satisfaction

H3: A positive and significant relationship exists between information quality and satisfaction

H4: A positive and significant relationship exists between service quality and satisfaction

H5: A positive and significant relationship exists between satisfaction and perceived performance

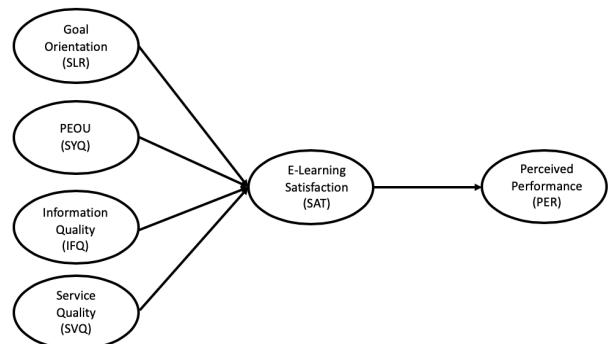


Figure 1: Research Framework

3. METHODOLOGY

This study was designed as a descriptive quantitative study. To test the hypotheses, a survey was conducted using a structured questionnaire as an instrument. Data for statistical analysis were collected through field survey in March 2020.

The survey was conducted at students at 4 universities in Bogor, Jakarta and Tangerang Indonesia as respondents. Students were originally regular students who were forced to do e-learning due to the COVID-19 outbreak. The survey was designed to evaluate perceives of use, goal orientation, service quality, satisfaction and perceived performance of students in an e-learning setting. Respondents were asked to self-rate those 5 variables. The method of sample collection was a convenience sample due to time and resource limitations. Additional descriptive information such as gender, age, and campus location were also asked. All collected questionnaires will be reviewed based on their completeness. If missing data is more than all statements in one variable, the questionnaire will be omitted. If the missing data is only for one question in one variable, data will be replaced with the mean value.

3.1. Measures

Respondent's responses were agreement rating using a 6-point Likert scale (1 for strongly disagree to 6 for strongly agree). A 6-point Liker scale was chosen to omit mid-point to avoid social desirability bias [40].

Goal orientation was measured using 3 indicators modified from [15]. The questionnaire was tapping the respondent evaluation on their satisfaction when learning new things at school, when do the task better than others and when don't have to work harder compared to others at school.

Measurement of PEOU, service quality and information quality were used referring to indicators from [27]. Indicators involve easiness to navigate, flexible and easy to understand for PEOU and responsiveness, interaction and function for service quality. Measurement of Information Quality includes accuracy, relevance, currency and organized.

Table 1: Measurement

Goal Orientation	Satisfaction when learn new things at school Satisfaction when do the task better than others Satisfaction when don't have to work harder compared to other at school.
PEOU	Easiness to navigate Flexible Easy to understand
Service Quality	Team responsiveness, interaction and function

Information Quality	Team interaction and function Team function Accuracy of information, Currency of information Relevancy of information
Satisfaction	Organization of information E-learning is a useful learning experience E-learning has met my expectation Overall satisfaction with e-learning.
Perceived Performance	Confidence to do well in exam Confidence to do well in assignment

Satisfaction on e-learning was modified from [39]. It covers the statements: e-learning is a useful learning experience, e-learning has met my expectation and overall satisfaction with e-learning.

Perceived performance includes student's perception and confidence to do well in exams and assignments.

3.2. Data analysis

Data from the returned questionnaire was compiled and analyzed. Data analysis used SEM with LISREL. A two-step approach was used. First, the measurement model analysis to ensure that all indicators or observed variables used are valid and reliable. After measurement model are concluded to be valid and reliable, the next step from the two-step approach is conducted a structural model analysis which includes: a) Overall Model Fit Test and b) Analysis/Significant Test on the relationship between 2 latent variables in the model

4. RESULT

One hundred fifty-six questionnaires were collected. There were 3 questionnaires should be omitted due to missing data and 153 questionnaires were eligible for further analysis. From 153 respondents 99% was between 17-23 years old. There are 61% male, 37% female and remaining chose not to answer. Eighty percent of the respondent is in 1st -2nd semester and 11% was 3rd - 4th semester. Almost 84% was from Tangerang and 11% was from Bogor (Figure 2).

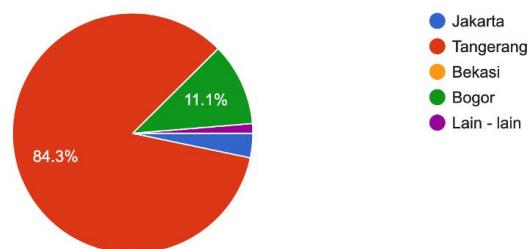


Figure 2: Campus Location

All indicators from 6 variables (goal orientation, PEOU, information quality, service quality, satisfaction, and perceived performance) had a loading factor >0.5 . Therefore, it can be concluded that all indicators were valid. However, Goal Orientation has SLR < 0.7 , therefore 2 indicators were dropped to improve the reliability (SLR01 and SLR2). The covariance matrix in table 2 and table 3 showed that all variables are valid.

The structural model analysis came out with RMSEA <0.08 (0.0544), NFI > 0.90 (0.978), NNFI > 0.090 (0.989), CFI > 0.9 (0.992) and IFI > 0.90 (0.992). Therefore, the conclusion is that the model has a good fit. The model was best represented the data reflects underlying theory.

Pathway analysis (figure 3) showed that PEOU (SYQ) and service quality showed a positive influence on satisfaction (SAT) with T-value >1.96 . Satisfaction also proved to have a positive impact to perceive performance (PER) with T-value >1.96 . However, the influence of information quality and satisfaction is not significant (T-value -2.031). This study failed to show the relationship between goal orientation (SLR) to satisfaction (T-value <1.96).

Table 2: Covariance Matrix of Variables (1)

Covariance Matrix						
	SLR02	SAT01	SAT02	SAT03	SYQ01	SYQ02
SLR02	0.791					
SAT01	0.116	1.251				
SAT02	0.031	1.074	1.541			
SAT03	0.099	0.923	0.907	1.296		
SYQ01	0.018	0.809	0.990	0.733	1.269	
SYQ02	0.065	0.672	0.788	0.618	0.749	1.181
SYQ03	0.156	0.848	0.963	0.782	0.992	0.705
IFQ01	0.111	0.715	0.744	0.611	0.745	0.739
IFQ02	0.100	0.691	0.758	0.635	0.684	0.722
IFQ03	0.075	0.685	0.748	0.633	0.738	0.789
IFQ04	0.021	0.727	0.788	0.662	0.813	0.769
SVQ01	-0.031	0.654	0.698	0.701	0.700	0.649
SVQ02	0.013	0.733	0.799	0.654	0.719	0.755
SVQ03	0.228	0.749	0.813	0.637	0.739	0.718
PER01	0.219	0.694	0.876	0.596	0.742	0.641
PER02	0.114	0.742	0.829	0.755	0.753	0.651

Table 3: Covariance Matrix of Variables (2)

Covariance Matrix						
	SYQ03	IFQ01	IFQ02	IFQ03	IFQ04	SVQ01
SYQ03	1.339					
IFQ01	0.817	1.178				
IFQ02	0.064	0.883	1.123			
IFQ03	0.779	0.854	0.847	0.984		
IFQ04	0.817	0.878	0.884	0.867	1.144	
SVQ01	0.619	0.579	0.601	0.670	0.750	1.177
SVQ02	0.728	0.659	0.747	0.812	0.850	0.829
SVQ03	0.746	0.742	0.749	0.754	0.745	0.702
PER01	0.902	0.579	0.688	0.723	0.677	0.646
PER02	0.934	0.678	0.740	0.783	0.701	0.640

Covariance Matrix				
	SVQ02	SVQ03	PER01	PER02
SVQ02	1.399			
SVQ03	0.870	1.168		
PER01	0.845	0.803	1.418	
PER02	0.876	0.778	1.181	1.596

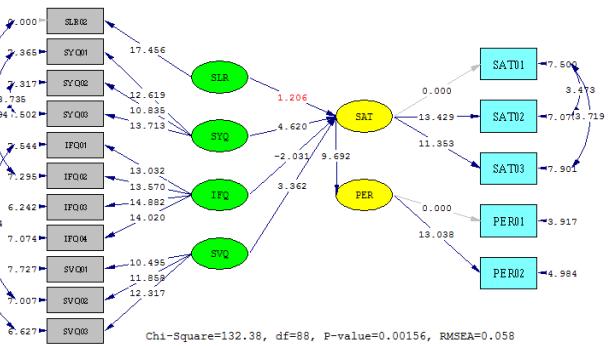


Figure 3: Pathway Analysis

The pathway analysis was used for hypothesis testing. With the result, H1 was rejected, there was not any positive and significant relationship exists between goal orientation and satisfaction. H2 was accepted. There was a positive and significant relationship exists between perceived ease of use and satisfaction. H3 was rejected. There was not any positive and significant relationship exists between information quality and satisfaction. H4 was accepted. There was a positive and significant relationship exists between service quality and satisfaction. H5 is accepted. There was a positive and significant relationship between satisfaction and perceived performance.

4. DISCUSSION

The result of this study provides further evidence about the important determinants of e-learning satisfaction. The respondents of this study were students who did not have the intention of e-learning. They were forced to attend e-learning due to unfortunate COVID-19 outbreak circumstances.

This study confirms previous study [24], [34] that PEOU is positively influencing e-learning satisfaction. The young generation has known to be technology savvy. They were growing up with technology. Generation Z starts using a gadget from a very early age. However, regardless of their confidence in using technology. The current generation has a characteristic of convenience. They want a product that is simple and fast [41]. They do not want complicated things. Therefore, PEOU is key in implementing the program and the access to e-learning.

Table 4: Hypothesis Testing

Coefficient	T-value	Conclusion
H1: A positive significant relationship exists between goal orientation and satisfaction	1,206	H1 rejected
H2: A positive and significant relationship exists between perceived ease of use and satisfaction	4,620	H2 accepted

H3: A positive and significant relationship exists between information quality and satisfaction	-0,492	-2,031	H3 rejected
H4: A positive and significant relationship exists between service quality and satisfaction	0,674	3,362	H4 accepted
H5: A positive and significant relationship exists between satisfaction and perceived performance	0,916	9,692	H5 accepted

Service quality has been a prominent concept of the antecedent of satisfaction. Satisfaction is influenced by how the service provider delivers the RATER [29]. This study confirms previous studies [31], [32], [34], [42] that service quality has a positive and significant causal relationship with e-learning satisfaction. Even though this young generation has known to has high confidence but they are also demanding [43]. The idea that they know how to contact, how to ask and know that there is a good responsiveness system applied will increase their security which will lead to an increase in e-learning satisfaction.

This study also confirms the previous studies [16], [27] satisfaction influences job performance in many ways. First, satisfy people will have more commitment. The high commitment will lead to better performance. Second, satisfaction will also increase people's engagement. Many studies in HR show that satisfied employees will have a better engagement and that will lead to better performance. Satisfaction will also increase emotional attachment.

This study failed to show the positive relationship between goal-oriented and information quality to satisfaction. Previous studies [25], [27], [28] claim that information quality has a positive influence on e-satisfaction. However, in this study, the relationship between information quality to e-learning satisfaction is not significant.

[44] state that perceived customer orientation might alter the influence of information quality on satisfaction. If the customer feels that there is high perceived customer orientation, the impact of information quality will be less compared to the low perceived customer orientation. In this study, most of the universities involved might have a high perception of customer orientation. Therefore, quality information has less impact on e-learning satisfaction. The other explanation is based on the previous study from [30]. The type of product might alter the influence of information quality on e-learning satisfaction. In this emergency condition, in education, the most important for the student is how they get good responsiveness and interaction and how

they get easy access to e-learning, therefore they might feel information quality is less important.

This study also failed to show the relationship between goal orientation to satisfaction. Unlike the result of [16] study which show that goal orientation influence participation and lead to e-learning satisfaction. One of the explanations is the type of delivery method. The mandatory class attendance and the more interactive class delivery method might increase the participation of students.

5. CONCLUSION

The COVID-19 pandemic outbreak is not only affecting human health, but it is also affecting other aspects of human life, including the education sector. In many countries, the recommendation of health authorities forced the education sector to find an alternative to the face-to-face method. The distance learning method may be the best option for students in a forced situation. Even though e-learning is a hot topic, e-learning is still more of a supplement to education in normal conditions.

D&M IS Success Model has implied that Information Quality, System Quality and Service Quality are important determinants of IS success. This study shows that System Quality (PEOU) and Service quality have a positive relationship to satisfaction which leads to perceived performance. However, this study fails to show the positive relationship between Information Quality and e-learning satisfaction. This study also fails to show the relationship between goal orientation to e-learning satisfaction.

The limitation of this study is the small number of respondents and the diversity of respondents. Further study with a large number and more diverse respondent needs to be explored. Further study with a mixed-method to understand more about how the regular student feels to be forced to shift to e-learning and their intention to e-learning after this forced experience will also be interesting to explore to improve the penetration of e-learning in the future.

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