The Interplay of Information Literacy, Learning Facility, Learning Achievement, and Motivation toward Online Learning Experience during COVID-19 Crisis: PLS-SEM Approach

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ABSTRACT

The COVID-19 crisis has forced the learning system in Indonesia from face-to-face learning to online learning. This rapid transformation presents various challenges, especially for universities in remote areas such as Papua. This study aims to explore the factors that can influence the students' learning experience. The research approach used is quantitative with an analysis model of PLS-SEM. The data were obtained using a simple random sampling technique from four universities in Merauke, with 207 respondents. Four hypotheses were accepted, and one hypothesis was rejected in this research. Online information literacy experience and online learning facility perspective were affecting online learning experience significantly. Meanwhile, the online learning facility perspective significantly affecting online information literacy experience and online learning achievement motivation. However, online learning achievement motivation has a positive correlation but does not contribute significantly to an online learning experience. This research implies that higher education institutions can focus on factors that significantly contribute to the student's learning experience to provide a positive experience and increase online learning effectiveness, especially during the COVID-19 crisis.

Keywords: learning experience, online learning, PLS-SEM, COVID-19

INTRODUCTION

The COVID-19 pandemic vividly has a tremendous impact on almost all global sectors, primarily economic, social, and education. In October 2020, Indonesia COVID-19 cases had been massively increased, positioning the highest Southeast Asia cases. Hence, since its initial spread in February, the Indonesian government has taken some policies to cut the spread of this virus by enacting social restrictions, physical restrictions, self-isolation, and large-scale social restrictions as the response to this pandemic. Furthermore, some cities took local lockdown policy affecting the closure of many public places such as stores, mosques, offices, public facilities, even schools, and universities.

Besides causing the global health crisis, initiating a global economic decline (Alon et al., 2020), and affecting the United Nations Sustainable Development Goal targets to end poverty by 2030 (Sumner et al., 2020), the COVID-19 pandemic has also resulted in a significant change in the education sector. For more than six months, schools and universities in almost all regions in Indonesia are closed. Unfortunately, this policy brings massive change in the educational system by shifting face-to-face learning to online learning.

In response to the COVID-19 pandemic, as the easternmost province in Indonesia, Papua had also taken a local lockdown causing the prohibition of sea and air transportation, restrictions on economic activities, closing public places, and no exception, the closures of universities. This policy then causes the shifting of the traditional face-to-face learning method to online learning along with all the challenges.

Since Papua is known as one of Indonesia's remote areas, some problems arise due to online learning implementation. Both students and lecturers face those problems. For the lecturer, limited infrastructure to technical support and the ability to use online learning tools become the main problem (Bao, 2020). The students have some issues related to a technical problems, lack of motivation, lack of learning support in their home environment, and lack of discipline to participate in online learning (Demuyakor, 2020). The conditions mentioned above reflect that one of the main problems the students face and the lecturer in this new digital learning era is digital inequalities. The preliminary study in a university in Merauke Papua shows that many students lack digital literacy skills.

Furthermore, inadequate support of internet connection in their homes also becomes a crucial problem that affects their online learning experience. Many previous studies have also discussed digital inequalities showing that the rural area's students who have poor ICT access have different educational experiences than those in the urban area significantly (Lembani et al., 2020; Oyedemi & Mogano, 2018). Therefore, both students and lecturers need to face this digital era by effectively enacting online learning.

THEORETICAL FRAMEWORK

Most authors define online learning as the access to the learning experience by using technology integration (Moore et al., 2011). It is known as the improved version of distance learning (Benson, 2002). The shifting of traditional teaching to this online learning undoubtedly brings significant changes to the students' learning experience. Learning experience refers to the student's interaction in the teaching-learning environment (Ning & Downing, 2011). However, Entwistle and Tait (1990) defined learning experience as the student's perception of the teaching and learning the environment that influenced their study behavior, rather than the virtual environment in an objective sense.

The use of online learning during this pandemic era aligns with 21st-century learning that demands the students to be more independent learners. Simultaneously, the teachers' role is more as a learning facilitator than a knowledge transmitter (Muhtia et al., 2018). This online learning also allows students to access the learning materials freely, have discussions, collect assignments, and get direct assessments. Electronic material transmission is advantageous in remote education since it saves time and money. Online communication allows students to access the content taxi from wherever they are and at a lower cost (Apriani & Hidayah, 2019). However, online learning may reduce the interpersonal interactions between the educators and the students, which is argued by some previous studies to impact negatively (Xiao, 2017). Furthermore, the absence of personal interaction also affects learners' achievement and attitudes in learning activities (Schmid et al., 2009). Besides, the online learning model also has an impact on limited emotional contact and collaboration during the learning process (Markova et al., 2017).

Therefore, besides considering the positive effect of online learning, the institution, in this case, the university's stakeholder, must be prepared to solve some problems that can arise from applying the online learning model, especially during the pandemic era. Further, these problems can be identified by investigating the interplay between factors that affect students' online learning experience. Many previous studies have scrutinized the factors influencing students' online learning experience. Bolliger and Wasilik (2009) show that student-related, instructor-related, and institution-related factors influence the online learning environment. Peltier et al. (2007) investigated the causal model of six influential factors of perceived quality of the online learning experience subsuming course content, student-student interaction, instructor-student interaction, course structure, mentoring. The application of the flipped classroom learning model also stimulates active learning to provide a better learning experience for students (Rathner & Schier, 2020). The application of e-learning during the COVID-19 crisis gives extra challenges for new students at medical universities (Chola et al., 2020). Moreover, Muir et al. (2019) examine online learning engagement as the influential factor of students' online learning experience.

These previous studies have given valuable insight concerning influential factors of online learning experience viewed from students, instructors, and institutions. However, to the best of our knowledge, no or less study focused on investigating the interplay between factors that affect students' online learning experience, especially in this pandemic era where everyone has to get ready to face the massive educational system change.

This current study investigated the interplay between the potential factors that affect students' online learning experience. There are three factors examined: online information literacy experience, online learning facility perspective, online learning achievement, and motivation. There are five proposed hypotheses from this study as follows:

1. H1: Online Information Literacy Experience > Online Learning Experience
2. H2: Online Learning Achievement Motivation > Online Learning Experience
3. H3: Online Learning Facility Perspective > Online Information Literacy Experience

4. H4: Online Learning Facility Perspective > Online Learning Achievement Motivation
5. H5: Online Learning Facility Perspective > Online Learning Experience

Online information literacy, which has been popular for the last two decades, allows the students to learn independently at their own pace to access the online materials anytime and anywhere (Stiwinter, 2013). Online learning communication is classified into two types: synchronous and asynchronous. First, synchronous communication requires all learners to be online at the same time. Second, asynchronous communication can occur in any sort of interaction at any time and from any location (Apriani & Hidayah, 2019). Furthermore, it is considered helpful as face-to-face instruction in learning outcomes and user preferences (Webb et al., 2017). Those main advantages of online information literacy are then expected to correlate to the online learning experience significantly. Online learning facilities such as learning media, learning tools, and internet access are also hypothesized to connect with students' online learning experience. Furthermore, it is expected to contribute to learning achievement and motivation (Pambudi et al., 2018) positively. The last factor, online learning achievement, and motivation are predicted to contribute to students ' online learning experience significantly. These hypotheses were examined in this current study by using a quantitative approach with PLS-SEM analysis to reveal the influential factors of students' online learning experience.

This study is critical because it provides valuable insight into the lecturers and institutions regarding the interplay between factors that affect students' online learning experience. These influential factors will help maximize online learning during the pandemic to achieve the learning objectives effectively.

RESEARCH METHODOLOGY

This research is a quantitative study that has an outcome to explore the factors that affect students' online learning experience, especially during the COVID-19 pandemic. Respondents involved in the research came from four universities located in Merauke, Papua. The respondents' demographic information is displayed in Table 1.

Table 1.
Respondents Demographic Information

	N	%
Gender		
Male	102	49.27
Female	105	50.73
Ethnicity		
Non-Papua	169	81.64
Papua	38	18.36

Simple random sampling is applied to obtain data using Google-Form. The instrument was adapted from previous research on learning experiences (Anwar & Wardhono, 2019). The questionnaire consisted of 18 questions with a 5 point Likert scale (strongly disagree (1)-strongly agree (5)). The questionnaire was written in Indonesian to make it easier for respondents to fill out the questionnaire. Before being distributed to respondents, pilot testing was carried out on the questionnaire, and a validity test was operated. The validity test was carried out by two experts from education management and one expert from the Indonesian language. Using SPSS 23, the reliability test showed that the Cronbach Alpha number was 0.832 and the r-value obtained was 0.71-0.81 (r table: 0.138). The instrument has an adequate level of reliability with valid question items. Furthermore, the online questionnaire link was distributed via students' WhatsApp groups and social media. The response was collected within two weeks in September 2020. Respondents who participated in filling out the online questionnaire totaled 207 people.

The data obtained from Google form was then analyzed using the SmartPLS 3.2 application to perform partial least squares structural equation modeling (PLS-SEM) analysis (Sarstedt et al., 2017). The initial step of the initial analysis carried out was the measurement model specification. Then proceed with the second step in the form of an outer model evaluation. Then, the last step taken is the inner model evaluation. These three steps are taken to ensure that the data is following the prerequisite tests so that a valid conclusion can be drawn.

FINDINGS & DISCUSSION

FINDINGS

The first phase of the PLS-SEM approach is the specification model, which is shown in Figure 1.
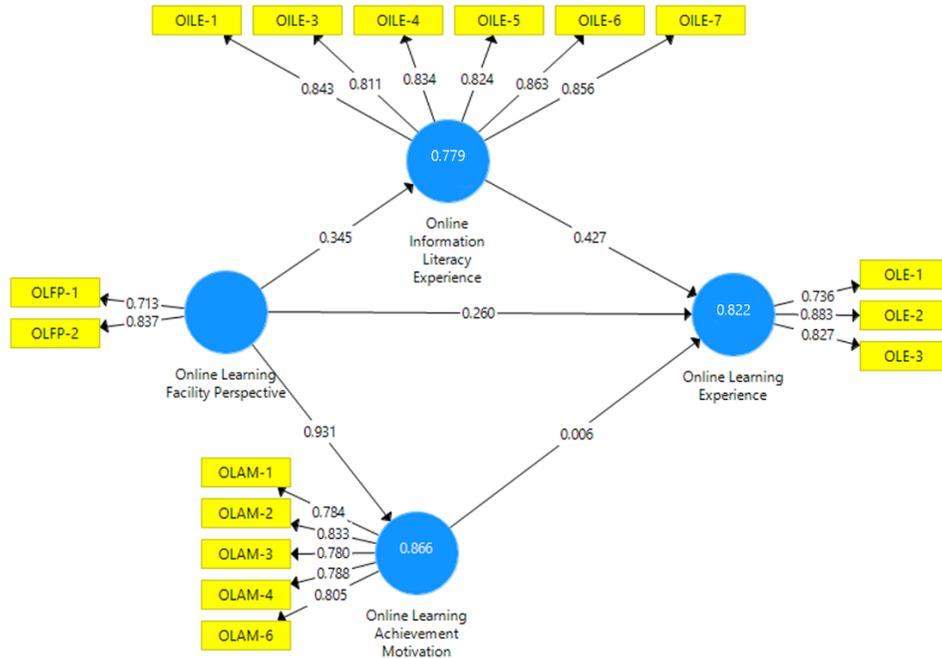
Figure 1. Confirmatory Factor Analysis Algorithm

The exogenous model consists of the Online Learning Facility Perspective (OLFP). The exogenous models that also operate as an endogenous model are the Online Information Literacy Experience (OILE) and the Online Learning Achievement Motivation (OLAM). The construct of the Online Learning Experience (OLE) becomes an endogenous model. The specification model has been described with four inner models and 16 outer models. The model is categorized as a reflective model.

The second phase is the outer model evaluation. This analysis step is used to assess the model to evaluate the relationship between variables and their indicators. The first step in the outer model evaluation is to assess the composite reliability, which assesses the

internal consistency reliability and indicator reliability. When assessing internal consistency reliability, the recommended value ranges from .70 to .90 (Hair et al., 2019). The composite reliability value from the analysis results in Table 2 is at a value of 0.767 to 0.849, which is categorized as reliability satisfactory. Furthermore, the analysis is carried out to determine the indicator of reliability. Hair Jr et al. (2014) suggest that the indicator's value should be > .708. Two indicators were dropped in Figure 1 OLAM-5 and OILE-2 because they have a value <7.08.

Table 2.
Composite Reliability and AVE

	Composite Reliability	Average Variance Extracted (AVE)
Online Information Literacy Experience	0.769	0.838
Online Learning Achievement Motivation	0.835	0.783
Online Learning Experience	0.767	0.831
Online Learning Facility Perspective	0.849	0.756

The next step for conducting an outer model evaluation is to assess convergent validity and discriminant validity. The value of the Average Variance Extracted (AVE) should be higher than .050. Based on Table 2, the AVE values obtained ranged from 0.756 to 0.838. Thus, convergent validity is established. On the other hand, to assess discriminant validity, the parameter used is to assess the Heterotrait-monotrait Ratio (HTMT) number to ensure each construct is different from other constructs. The recommended number is <.85. Based on the value obtained in the data analysis in Table 3, there is no value higher than .85, which means discriminant validity is established.

Table 3.
Heterotrait-Monotrait Ratio (HTMT)

	OILE	OLAM	OLE	OLFP
OILE				

OLAM	0.711			
OLE	0.695	0.679		
OLFP	0.714	0.668	0.444	

The third phase is the inner model evaluation. This phase is used to assess the structural model that reflects the relationship between variables and test the hypothesis in the inner model. Researchers carry out a collinearity test to obtain a Variance Inflation Factor (VIF) value. This process was carried out to ensure that no predictive problems arise due to high collinearity. The recommended VIF is <3. In Table 4, the VIF values obtained are in the range of 1,000 to 1,542. There is no collinearity issue, so the inner model evaluation analysis phase can be continued.

Table 4.
Collinearity Statistic (VIF)

	OILE	OLAM	OLE	OLFP
OILE			1.146	
OLAM			1.502	
OLE				
OLFP	1	1	1.542	

The first step in inner model evaluation is assessing coefficient determination. This step is used to assess the model's predictive accuracy. The value of R^2 varied from 0 to 1 that categorized into three categories .75, .50, .25 (great, moderate, substantial) (Hair Jr et al., 2014). The predictive accuracy value in Table 5 indicates that Online Information Literacy Experience and Online Learning Experience has moderate predictive accuracy. Meanwhile, the predictive accuracy value of Online Learning Achievement Motivation has great predictive accuracy.

Table 5.
R-Square (R^2) Value

	R Square
Online Information Literacy Experience	0.519
Online Learning Achievement	0.866

Motivation	
Online Learning Experience	0.722

In addition, an assessment of cross-validated redundancy is carried out. The outcome of this assessment is to assess the inner model predictive relevance by calculating the Q^2 value. Q^2 value should be more than zero, which is categorized into small (0.), medium (0.25), and substantial (0.50) (Hair Jr et al., 2014). Based on Table 6, the values are implied that the predictive relevance model (Q2) has a substantial value (> 0.50).

Table 6.
Predictive Relevance (Q^2)

	SSO	SSE	Q^2 (=1-SSE/SSO)
Online Information Literacy Experience	712	264.552	0.511
Online Learning Achievement Motivation	720	269.525	0.563
Online Learning Experience	702	266.320	0.532
Online Learning Facility Perspective	710	267.567	

The third step in the inner model evaluation is the path coefficients assessment. This stage is undergone to examine the formulated hypothesis. Standardized path coefficient value ranges from -1 (strong negative relationship) to +1 (strong positive relationship) (Hair Jr et al., 2014). Researchers determine standard error before deciding its significance (Helm et al., 2010). Based on Table 7, the obtained standard error value is > .1, which means the model has 5% standard errors. The significance value of standard error 5% is used *T*-Statistics of 1.96 (Wong, 2013). *T*-Statistic value > 1.96 indicates that the model has a strong positive relationship.

Table 7.
Structural Model Assessment

	Original Sample	Sample Mean	Standard Deviation	T Statistics (|O/STDEV|)	P Values

	(O)	(M)	(STDEV)		
OILE -> OLE	0.427	0.241	0.361	1.181	0.238
OLAM -> OLE	-0.006	0.061	0.385	0.016	0.988
OLFP -> OILE	0.345	0.351	0.095	3.649	0
OLFP -> OLAM	0.931	0.909	0.033	28.084	0
OLFP -> OLE	0.26	0.077	0.371	0.702	0.483

Table 7 indicates (H2) is not supported due to the t-value is below 1.96. The (H1), (H3), (H4), (H5) have a T-value of more than 1.96, which means the four hypotheses were supported. In summary, the online learning facility perspective was significantly correlated with online information literacy experience, online learning achievement motivation, and online learning experience. Meanwhile, online information literacy experience was significantly correlated with the online learning experience. The relevance of significant relationship f^2 is evaluated after the researcher verifying the significance of the relationship. The value of .02, .15, and .35 indicate small, medium, and significant effects. Table 8 indicates that the online learning facility perspective has a significant effect on online learning achievement motivation.

Meanwhile, the online learning facility perspective has a negligible effect on online information literacy experience and online learning experience. Meanwhile, online information literacy experience has a medium effect on the online learning experience. Due to the H2 is rejected, online learning achievement motivation does not affect the online learning experience.

Table 8.
The Effect Size

	OILE	OLAM	OLE
OILE			0.234
OLAM			0
OLE			
OLFP	0.135	6.469	0.013

DISCUSSION

This study is used to determine the factors that are related to the online learning experience. Several factors are significantly related to the online learning experience. The first related factor is the online information literacy experience. The *T*-value results show that OILE contributes significantly to OLE. Student activities in using information literacy skills, which consist of finding, evaluating, processing, and distributing information online, also play a role in shaping the online learning experience. Online information literacy experience is the basis for equipping students to be confident and know several important abilities (Freeman & Lynd-Balta, 2010).

Furthermore, OLAM does not have a significant contribution to OLE. Students' perceptions regarding learning achievement and motivation did not correlate with students' experiences in learning online. Competition to get good grades between students, challenges, and student motivation in online classes does not contribute significantly to the online learning experience. Students' characteristics, especially those in rural areas, are thought to cause OLAM not contributing significantly to OLE. In previous research findings, learning achievement and motivation are considered dependent factors that can influence several factors. However, there is a positive indication of online learning's effectiveness on learning achievement and motivation for vocational students (Hoerunnisa et al., 2019). Also, gamification has been shown to positively correlate with learning achievement and motivation (Boudadi & Gutiérrez-Colón, 2020).

The subsequent finding of this study is that OLFP is significantly correlated with OILE and OLAM. Information literacy skills, which consist of searching, evaluating, processing, and disseminating information online, are also significantly affected by the online learning facility. Learning facilities in learning media also contribute to students' level of information and media literacy (Elmunsyah et al., 2018). Furthermore, the online learning facility perspective also contributes positively to online learning achievement and motivation. Students think that assistance in learning facilities and the internet can contribute positively to motivation and learning achievement. Learning facilities such as learning media have been proven to positively impact learning achievement and motivation, especially those using technology or online form (Pambudi et al., 2018).

The final finding of this study is that OLFP significantly contributes to OLE. The T-value result shows that OLFP is significantly correlated with OLE. Students believe that online learning facilities' availability in laptop/smartphone devices and internet services also contributes to the online learning experience. Previous research findings have suggested that infrastructure is essential in implementing online classes (Nwankwo, 2018). Another factor in the form of ability by educators, students, and parents also contributes to providing online learning facilities (Lestari & Gunawan, 2020).

The research conducted has new implications for the factors that influence the students' online learning experience. By paying attention to several factors that positively contribute significantly to OLE, higher education institutions or teaching staff can make policies to focus on factors that can increase student satisfaction in online learning. This study's findings are expected to provide new insights and be the basis for determining online learning policies, especially during the pandemic or post-COVID-19 pandemic.

CONCLUSION

This study aims to determine the factors that contribute to the students' learning experience. There are four hypotheses accepted from this research, namely H1 (Online Information Literacy Experience> Online Learning Experience), H3 (Online Learning Facility Perspective> Online Information Literacy Experience), H4 (Online Learning Facility Perspective> Online Learning Achievement Motivation), and H5 (Online Learning Facility Perspective> Online Learning Experience). H2 (Online Learning Achievement Motivation> Online Learning Experience) has a positive correlation but does not contribute significantly. This research implies that universities can focus on factors that contribute significantly to the online learning experience. With the focus on improving these factors, it is hoped that students' online learning experience will be more satisfying, especially during the COVID-19 crisis.

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