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Trust and Perceived Risks in High School Students' Online Learning Behaviour During Covid19 Pandemic

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Abstract—This study explores online learning by Indonesian high school students during the Covid19 Pandemic. Many high schools in Indonesia use online learning technology in Google Classroom and Google Meet. The sudden and forced switch from a conventional classroom to a fully online one caught many off guards. This study looks at the behavior of Indonesian high school students in facing sudden changes in study mode from offline or hybrid to full online due to the Covid19 Pandemic. Theory of Planned Behaviour is used and extended by adding Perceived Risks dan Trust to develop a questionnaire. Trust in this study is differentiated between Trust Toward Application and Trust Toward Organization. The survey was distributed to 1986 students from three private high schools in Yogyakarta, Indonesia. As many as 462 responses were received, representing a 23.26% response rate. Data were analyzed using PLS-SEM. The analysis of survey results confirms that TPB, Perceived Risks, and Trust could explain the use of Online Learning by Indonesian high school students. Furthermore, Trust is also influenced, albeit in a small percentage, Perceived Risks.

Keywords—Theory of Planned Behaviour; Perceived Risks; Trust; Covid19 Pandemic

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I. INTRODUCTION

Global Covid19 Pandemic officially reached Indonesia in early March 2020. It spread to all 34 provinces in Indonesia by early April 2020. By the end of March 2020, the government implemented many control measures to limit the spread of Covid19. The government implemented Covid19 transmission control protocol such as the closure of public places and facilities, cancellation of public events, and urging citizens to stay home while practicing health protocols. As the Covid19 Pandemic spread across Indonesia, many schools were closed and forced to conduct online learning activities since March 2020 [1, 2]. The sudden move to fully online learning creates many problems for schools in Indonesia. Before closure, most schools in Indonesia conduct learning processes by conventional practice, which is on campus and offline. Some schools have been introducing hybrid learning, but it was in an entirely classical model most of the time. Many schools rely on conventional teaching and learning methods due to limited budget, human resources, and availability of infrastructure, especially schools located outside Java. The forced switch to fully online learning caught many of them off guard. Even within schools that are considered capable of running eLearning, the majority is still using technology in supporting roles or hybrid mode rather than primary (as in fully online learning). Learning Management Systems are like Moodle, Google Classroom, and Claroline complement the conventional classroom. Traditional methods of learning are still dominating many Indonesian schools.

Just in the middle of all these problems, some bad news emerged. Zoom was hit by security problems, one of the most popular video meeting platforms [3]. Zoom is a popular platform to be used alongside Google Meet and Microsoft Teams to have face-to-face meetings in an online classroom. Another security-related news came from the biggest marketplace in Indonesia, which was hacked and had its data compromised [4]. Both incidents were not encouraging for all the teachers and students that must work from home and switched to primarily online activities. When school closure started as part of Covid19 response, many schools struggled to cope with the sudden and forced switch to a fully online learning process. Many barriers hinder the use of online classrooms, which are [5]:

- School-level is such as supporting infrastructure and systems, policy, and textbooks.
- Teacher levels include skills, knowledge, confidence, and experience in creating and delivering eLearning.
- The curriculum level is such as suitable curriculum and materials for online learning.
- Students' level includes skills, knowledge, motivation, and infrastructure to participate actively in eLearning.

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This study is focused on Indonesian high school students who are impacted by the sudden switch from offline to online learning in Indonesia during Covid19 Pandemic. The students' intention to use eLearning tools during forced online class sessions is explored using the Theory of Planned Behaviour or TPB [6-9]. Then this study used Perceived Risks and Trust as factors that influence high school students' intention to use eLearning to extend TPB [10, 11].

The use of information technology in high schools comes in many forms. There is support for delivering teaching materials such as computers, Learning Management Systems or LMS, computerized content, and the Internet as teaching delivery media [12, 13]. The content is delivered as part of eLearning includes, among others, animation to help understanding concepts [14], using Think Pair Share for improving problem-solving skills in an eLearning environment [15], and using LMS for independent study, discussion, and group learning in an online environment [16]. Indonesian Ministry of Education has also pushed the use of Information Technology for schools. Schools must use the application provided by the Ministry of Education to submit reports on many aspects of their schools, such as student attendance and grades, human resources, financial matters, test results, etc. High School final exams for year 12 students have been using a computer-based test (CBT) since 2014, albeit it is not a real-time online test system. State schools have also received support from the government to upgrade their Information Technology equipment and skills. Apart from the government, plenty of vendors also offer Information Technology support for schools. The offers range from tools to support the teaching and learning process, such as the modified version of Moodle LMS and Google Classroom, tools for school administration, networking, and internet management, etc. Many schools do not have dedicated IT staff, so outsourcing is the preferred alternative solution. Although those schools have been investing in IT quite heavily, the use of IT is still at the supplemental level. They provide LMS, Wi-Fi for students and staff, computer equipment, digital course content, CBT systems, etc. The main teaching and learning process is mostly using conventional face-to-face classrooms.

Some bad security news suddenly appears in the middle of sudden and abrupt adjustment to fully online learning. Zoom, a popular video meeting platform, was hit by security problems in the middle of the early Covid19 Pandemic lockdown [3]. Zoom is a popular platform to be used alongside Google Meet and Microsoft Teams to have video meetings in an online classroom. Zoom also admitted that their data routing created concern among users in western countries [17]. Other news came from the biggest marketplace in Indonesia, which was hacked and had its private data compromised [4].

Suddenly forced switch to fully online learning is a problematic situation. People might have trust problems when dealing with others online [18-21]. The issues of Trust related to security

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concerns might influence students' perception toward using online learning. The condition is exacerbated by students' and teachers' inability to interact like pre-Covid19 Pandemic conditions directly. Online learning could make students feel isolated and lonely and affect their learning ability [22, 23]. Online classrooms cannot replace physical class, a form of social interaction [24, 25]. Social interaction in a physical setting is preferable and deemed better than social interaction in an online environment.

Many theoretical frameworks can be used to analyze the adoption of any technology, and it can be from different perspectives, namely individual, organizational, and interactive processes [26]. Most theories are based on either psychology or communication disciplines from the user's perspective. The psychological based idea that has been extensively used is in the form of Theory of Reasoned Action or TRA [27], Theory of Planned Behaviour or TPB [6, 8, 28], Technology Acceptance Model or TAM [29-32], and Unified Theory of Acceptance and Use of Technology or UTAUT [33, 34] among others.

Icek Ajzen developed the theory of Planned Behaviour or TPB to improve the Theory of Reasoned Action or TRA [6, 7, 27, 35]. The intention influences the behavior of an individual. The intention is influenced by Attitude Toward Behaviour, Subjective Norms, and Perceived Behavioural Control [6, 7, 28, 36, 37]. TPB has been used to predict and explain behavior in many settings [38]. TPB has been used and extended in various studies. Concerning computer usage behavior, TPB has been used to predict the adoption of eCommerce [38-42], to predict behavior in mobile viral marketing [43], adoption of e-Government [44], and even in education setting concerning eLearning [45-47].

Some TPB studies have also involved Trust and Risks [18, 21, 44, 48]. Trust is defined as a personality characteristic of an individual that influences interactions with online applications involving reliability and dependability [18]. Risk is defined as uncertain conditions associated with decision-making [44, 48-50]. Usage of any online application would increase if the application and organization behind the application could be trusted [20, 50-52]. The perceived risk would negatively influence the usage of any online applications [40, 50, 53, 54].

Based on the previously discussed literature, this study forms the following extension of TPB to explore the online learning experience of the respondents. This study uses perceived risks and Trust (toward application and organization) in addition to the original TPB.

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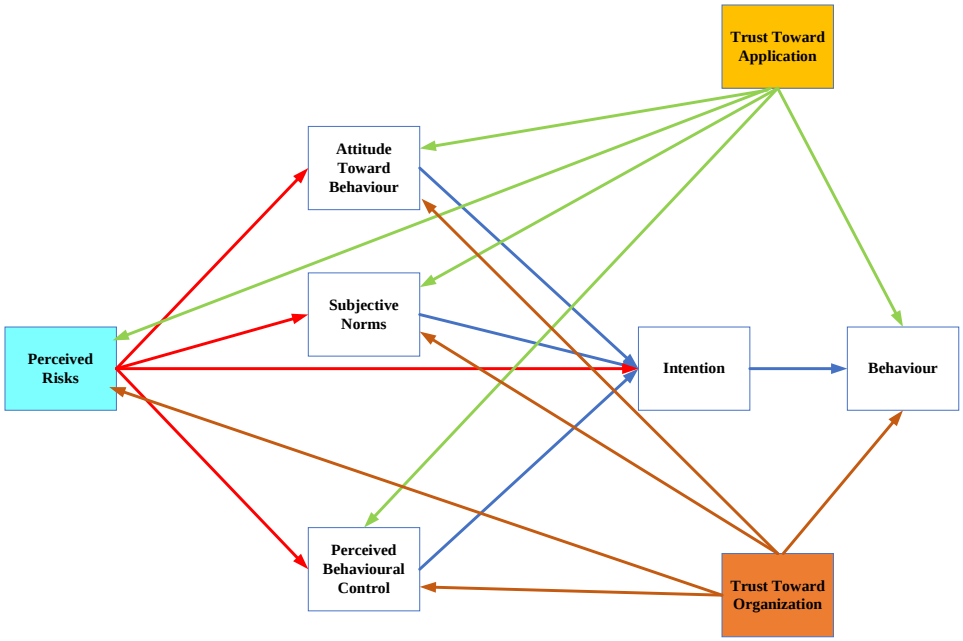

Figure 1. RESEARCH MODEL

The hypotheses were formed based on the proposed model. The first series of hypotheses are based on the TPB model [6-8, 28, 37], which are:

- *H1 Attitude Toward Behaviour would influence intention to use Online Learning*
- *H2 Subjective Norms would influence intention to use Online Learning*
- *H3 Perceived Behavioural Control would influence intention to use Online Learning*
- *H4 intention to use Online Learning would influence behavior (the actual use of Online Learning)*

The next series of hypotheses are formed to accommodate Perceived Risks' influence toward TPB. Risk Perception influences Attitude Toward Behaviour [40, 44, 48]. Risk Perception influences Attitude Toward Behaviour and Subjective Norms [44, 55] and Perceived Behavioural Control [44, 55]. In a typical TPB-based study, Perceived Risks do not directly influence intention. Some studies showed that Perceived Risk could affect intention directly [56, 57]. The higher the risks, the less likely an individual would intend to conduct a behavior. Based on those literature findings, the following hypotheses are formulated:

- *H5 Perceived Risks would influence Attitude Toward Behaviour*
- *H6 Perceived Risks would influence Subjective Norms*
- *H7 Perceived Risks would affect Perceived Behavioural Control*
- *H8 Perceived Risks would influence intention to use Online Learning*

The last series of hypotheses are developed to accommodate the influence of Trust toward TPB and Perceived Risks [21, 44, 48]. In this study, Trust is shown as two variables: Trust Toward Applications and Trust Toward Organisation. This study's two relevant components are

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the eLearning applications and the organization that managed the applications. Therefore, the users need to trust both the applications and the organization which drives them. Literature showed that Trust could influence many parts of TPB. Trust could influence Attitude Toward Behaviour, Subjective Norms, and Perceived Behavioural Control [44, 55, 58-60]. The latest version of TPB shows that behavior could be influenced by Actual Behavioural Control, which is defined as the extent to which an individual has the skills, resources, and other prerequisites needed to perform the behavior in question [8]. Trust could be seen as an Actual Behavioural Control that influences the actual behavior. Trust can also affect Perceived Risks. The bigger the Trust, the lower perceived risks [61]. Based on the literature, the following hypotheses are proposed:

- *H9 Trust Toward Application would influence Attitude Toward Behaviour*
- *H10 Trust Toward Application would influence Subjective Norms*
- *H11 Trust Toward Application would influence Perceived Behavioural Control*
- *H12 Trust Toward Application would influence Perceived Risks*
- *H13 Trust Toward Application would influence behavior (the actual use of Online Learning)*
- *H14 Trust Toward Organization would influence Attitude Toward Behaviour*
- *H15 Trust Toward Organization would influence Subjective Norms*
- *H16 Trust Toward Organization would influence Perceived Behavioural Control*
- *H17 Trust Toward Organization would influence Perceived Risks*
- *H18 Trust Toward Organization would influence behavior (the actual use of Online Learning)*

The following sections will discuss the research methods and explain the data collection and analysis. The following sections will contain the data analysis and result discussion. The last section is the conclusion of the study.

II. RESEARCH METHOD

This study uses a quantitative research approach. It involves three private high schools in Yogyakarta. Although the schools themselves are in Yogyakarta, their students come from many different places all over Indonesia. The combined total of students registered in 2020 is 1986. More than 50% of those students come from outside Yogyakarta. The author believes that the geographical origins of those students could represent the local condition all over Indonesia. The three schools used Google Classroom and Google Meet for delivering course materials, having video meetings, assignment delivery and submissions, and exams.

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We developed a questionnaire based on TPB, which measures Attitude Toward Behaviour, Subjective Norms, Perceived Behavioural Control, Intention, and Behaviour [6-8, 21, 38, 44, 62]. We also add questions to assess Perceived Risks [44, 61] and Trust, identified as Trust Toward Applications and Trust Toward Organization [21, 44, 48]. The questionnaire used a 7-point Likert Scale that strongly disagreed (1) to strongly agreed (7).

This study focuses on three private high schools in Yogyakarta Special Province (Yogyakarta in short), Indonesia. Yogyakarta is unique in the Indonesian education scheme. It has been known as the City of Students. Yogyakarta has more than 100 higher education institutions which are the highest in Indonesia. Yogyakarta also has more than 3000 schools catering from primary to high schools. Yogyakarta, as a small province, relies heavily on education and tourism. When Covid19 Pandemic forced all schools in Indonesia to close their campuses, many students were forced to conduct online learning from home. Many private schools in Indonesia admit students from all over Indonesia . Since the Covid19 Pandemic started, most of those students returned to their hometown and must participate from afar. We invited all the students to fill out online questionnaires using Google Forms. In the end, as many as 462 responses were received, or a 23.26% response rate. The students are in 24 different provinces all over Indonesia. The respondent's demographical data can be seen in table 1.

Table 1. RESPONDENTS' PROFILE

Criteria	Sub Criteria	Amount
Gender	Male	260
	Female	202
Class	X	262
	XI	143
	XII	57
Program	Science and Math	237
	Social Science	154
	Culture and Language	71

We used a modified TPB questionnaire by adding three variables: Trust Toward Applications, Trust Toward Organization, and Perceived Risks. The electronic questionnaire was designed to prevent missing answers for mandatory questions; therefore, all 462 returned questionnaires are complete without any lost value. SEM PLS is used to analyze data. The data is analyzed using software SmartPLS version 3. As suggested by Hair et al., the data analysis steps were done [63].

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III. RESULT AND DISCUSSION

Data analysis in SEM-PLS is started by testing the reliability of reflective indicators using PLS Algorithm in SmartPLS version 3 [63-66]. To be considered reliable, an indicator should have an outer loading value above 0.7 [65]. One indicator for Attitude Toward Behaviours, four indicators for Behaviours, and two indicators for Perceived Behavioural Control have to be dropped. Another test confirmed that all the remaining indicators are deemed reliable.

The next step is to test internal consistency reliability, convergent validity, and discriminant validity [65]. In SmartPLS version 3, the result can be found in Construct Reliability and Validity and Discriminant Validity [66]. Internal consistency reliability should be above 0.7, Convergent Validity (Average Variance Extracted or AVE) should be above 0.5, and Heterotrait-Monotrait (HTMT) values should be below 0.85 [65]. All constructs in this study satisfy those criteria.

Lastly, the structural model is tested for collinearity. The result can be found in Collinearity Statistics (VIF) as Inner VIF Values report. The VIF value should be below 5 [63, 65]. All VIF values are below five; therefore, there are no collinearity issues in the structural model.

Looking at the result of the initial data analysis, it could be confirmed that the research model proposed is sound. All indicators have been tested, and only reliable indicators are used [63-66]. All constructs are valid and dependable (both discriminant and convergent validity).

Having reliability and validity of both indicators and constructs and confirming the absence of collinearity issues in the structural model, the next step is to test hypotheses. Hypotheses testing utilizes the Bootstrap facility within SmartPLS version 3 [66]. The result can be found in Path Coefficient Report, as seen in Figure 2.

		Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
H1	Attitude Toward Behaviour -> Intention	0.135	0.136	0.058	2.332	**0.020**
H2	Subjective Norms -> Intention	0.421	0.421	0.052	8.067	**0.000**
H3	Perceived Behavioural Control -> Intention	0.258	0.258	0.047	5.495	**0.000**
H4	Intention -> Behaviour	0.481	0.478	0.047	10.305	**0.000**
H5	Perceived Risks -> Attitude Toward Behaviour	-0.003	-0.003	0.042	0.065	**0.948**
H6	Perceived Risks -> Subjective Norms	0.173	0.173	0.046	3.785	**0.000**
H7	Perceived Risks -> Perceived Behavioural Control	0.099	0.100	0.046	2.148	**0.032**
H8	Perceived Risks -> Intention	0.075	0.074	0.033	2.291	**0.022**
H9	Trust Toward Applications -> Attitude Toward Behaviour	0.348	0.347	0.063	5.544	**0.000**
H10	Trust Toward Applications -> Subjective Norms	0.402	0.402	0.062	6.445	**0.000**
H11	Trust Toward Applications -> Perceived Behavioural Control	0.374	0.374	0.049	7.567	**0.000**
H12	Trust Toward Applications -> Perceived Risks	-0.287	-0.291	0.060	4.765	**0.000**
H13	Trust Toward Applications -> Behaviour	0.093	0.097	0.045	2.074	**0.038**
H14	Trust Toward Organisations -> Attitude Toward Behaviour	0.415	0.418	0.060	6.883	**0.000**
H15	Trust Toward Organisations -> Subjective Norms	0.210	0.211	0.059	3.532	**0.000**
H16	Trust Toward Organisations -> Perceived Behavioural Contro	0.368	0.370	0.047	7.781	**0.000**
H17	Trust Toward Organisations -> Perceived Risks	0.058	0.062	0.060	0.971	**0.332**
H18	Trust Toward Organisations -> Behaviour	0.262	0.261	0.048	5.424	**0.000**

Figure 2. HYPOTHESES TESTING RESULT

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A hypothesis is supported if the T Statistics value is more significant than 1.64 (two-tailed test) and P values are less than 0.05 [63-66]. Based on the hypotheses testing, hypotheses H5 and H17 are not supported by data analysis results. Perceived risks of using eLearning are not influencing attitude towards using eLearning [10, 44, 67]. Trust toward organizations is not controlling perceived risks [10, 52, 68-70]. Data analysis results support all other hypotheses. The model's explanatory power can be seen in R^2 values in table 2 below [63, 65, 66].

Table 2. R SQUARED

	R Square	**R Square Adjusted**
Attitude Toward Behaviour	0.462	0.459
Behaviour	0.486	0.483
Intention	0.539	0.533
Perceived Behavioural Control	0.419	0.415
Perceived Risks	0.066	0.062
Subjective Norms	0.291	0.286

Blindfolding and PLS Predict procedures assess the model's predictive relevance. [63, 65, 66]. All endogenous constructs have Q^2 values bigger than 0, supporting the model's predictive relevance. PLS Predict confirms the model's predictive power compared to naïve prediction [63, 65]. All Q^2 Predict values are larger than 0, indicating the model is better than simple prediction. The result of the data analysis will be discussed in the next section.

Based on the hypotheses testing's results, this study confirmed the availability of TPB to explain the forced use of online learning under the Covid19 Pandemic. Hypotheses testing ensures that intention to use online learning is influenced by Attitude Toward Behaviour, Subjective Norms, and Perceived Behavioural Control [6-8, 28, 37]. The intention is also confirmed to influence behavior using Online Learning [6-8, 28, 37].

Other results confirmed Perceived Risks' influence on Subjective Norm, Perceived Behaviour Control, and Intention to use Online Learning [44, 55]. Perceived Risks is not influencing Attitude Toward Behaviour in this study. Attitude Toward behavior is the value of behavior perceived by an individual [6-8]. Perceived Risks are not influencing the importance of conducting Online Learning. The respondents saw performing Online Learning as a positive behavior even with some risks that might threaten security.

Both Trust Toward Application and Trust Toward Organisation influence is quite similar. Both Trust Toward Application and Trust Toward Organisation influencing Attitude Toward Behaviour, Subjective Norms, and Perceived Behavioural Control. The findings confirmed previous studies [44, 55, 58-60]. The influence of Trust toward Behaviour confirms our hypotheses that Trust acts as Actual Behaviour Control, which influences Behaviour and Perceived Behavioural Control [8].

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Trust Toward organization is not influencing Perceived Risks. It seemed that the respondents believed that the Perceived Risks were on the application's side rather than on the Organisation's side. [21, 44, 48]. The application, Google Classroom and Google meet, is outside the organization's control; therefore, the respondents did not see the organization as a risk factor.

IV. CONCLUSION

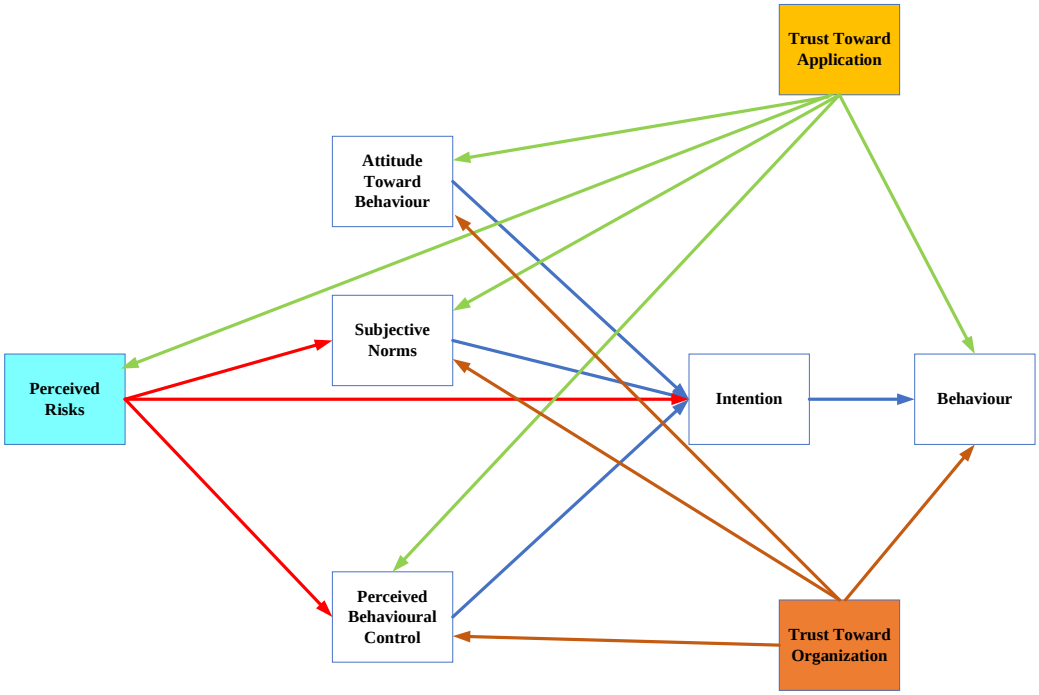

Figure 3. THE FINDINGS

As seen in Figure 3, the study results confirm that TPB can explain the use of Online Learning by three high school students. The use of Online learning is influenced by intention to use Online Learning. The intention to use Online Learning is influenced by Attitude Toward using Online Learning, Subjective Norms, and Perceived Behavioural Control. This study also confirms that perceived risks influence subjective norms, Perceived Behavioural Control, and Intention to use Online Learning. This study is also approved that Trust Toward Organisation and Trust Toward Application influence Attitude Toward using Online Learning and Subjective Norms. At the same time, both Trust Toward Organisation and Trust Toward Application act as Actual Behavioural Control, which influences both behavior (using Online Learning) and Perceived Behavioural Control. The implications of this study are Trust Toward Organizations and Application is a significant influence toward the use of eLearning. Therefore schools management needs to ensure the security of eLearning is maintained. The school management also needs to select secure eLearning applications since it influences students' perceived risks.

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Although this study only involved students from three private high schools in Yogyakarta, we believe that the result could be an indication that represents Indonesia. More than 50% of those three private high schools students come from outside Yogyakarta Province. Our survey confirmed that the respondents come from 24 provinces. Their local conditions are deemed sufficient to represent Indonesian high school students. Future research may need to include schools situated in the area where IT infrastructure is not ideal to see the impact on students' attitudes. Another area of exploration is the teachers and schools' administration staff. Online working might affect eLearning.

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