


# The Influence of Studying from Home, Stress Level, and Ability to Use Technology toward Learning Achievement during the COVID-19 Pandemic: A Case Study in Indonesia

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**Keywords:** COVID19, Studying from Home (SFH), Ability to Use Technology, Stress Level, Learning Achievement.


**Abstract:** The COVID-19 pandemic has caused drastic changes to all aspects of life, including studying from home, the ability to use technology, and learning achievement in Indonesia. This study aims to analyse the effects of studying from home, the ability to use technology, and the level of stress on student learning achievement in Indonesia during the pandemic, where all students must learn from home. Data collection was conducted by issuing an online survey to 107 college students aged 18 to 55 in Indonesia. The data processing found that studying from home had a significant influence on stress levels and the ability to use technology. However, studying from home does not directly influence learning achievement, while stress and the ability to use technology do not directly correlate with each other. Interestingly, the indirect effects of studying from home on learning achievement are significant when stress and the ability to use technology mediate the relationships. This indicates that, although the pandemic is stressful for students as it forces them to isolate themselves at home and to miss out on face-to-face learning on campus, it has enhanced their ability to use technology and thus positively reinforced learning achievement. The result indicates that, in terms of learning achievement, students work “better under pressure” with their enhanced ability to use technology resulting in improved learning achievements. Consequently, the increasing ability to use technology when learning from home, the obstacles in knowledge transfer can run smoothly, and this hopefully reduces students’ stress levels in the long term.


## 1 INTRODUCTION


The COVID-19 pandemic has had a huge impact on various sectors (Nurhayati et al., 2021). In order to prevent transmission in schools, including universities, the government of Indonesia has made policies related to the prevention and handling of COVID-19, including the Circular Letter No. 2 of 2020 on the Prevention and Handling of COVID-19 in the Kemendikbud Environment, Circular Letter No. 3 of 2020, The Prevention of COVID-19 in the Education Unit; Circular Letter No. 4 of 2020 on the Implementation of Education Policy in the Emergency Period of the Spread of Coronavirus Disease (COVID-19), which contains directions on

learning from home; and Circular Letter No. 15 of 2020, Guidelines for the Implementation of Studying from Home in the emergency period of the spread of COVID-19. Several problems arise in the teaching and learning process, particularly relating to the use of technology, stress levels, and achievements of learning outcomes with changes from face-to-face learning to distance learning through the use of virtual networks (Allsopp et al., 2019). Another concern is that limited Internet availability can be a disadvantage for teachers and students (Prodjo, 2020). Limited ownership of computers/laptops and problems with Internet access cause uneven access to online learning.

The COVID-19 pandemic is causing uncertainty around the world (Yin, 2018), so organizations need

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to develop innovative solutions in the face of uncertainty (Teece & Leih, 2016). The use of technology and the ability to use it can solve some of the problems caused or exacerbated by the pandemic (Yoo et al., 2010). As the locus of innovation moves beyond the confines of a single design hierarchy and the network evolves, knowledge management and virtual teams need to be coupled with new tools that can handle heterogeneity and the dissemination of knowledge, i.e., digitization to generate new experiences, new processes, and new organizational forms using technology (Yoo, 2012). The number of cases of COVID-19 infection in Indonesia is existing, which explains why studying from home continues. Studying from home forces students and lecturers to adopt new norms of learning, from face-to-face in the classroom to online interaction, which is done synchronously or asynchronously through the learning media of YouTube, Google Meet, Zoom, WhatsApp, and many other applications and platforms. This requires reliable Internet access and support, so that the teaching and learning process becomes smoother.

Previous research mentioned that more electronic learning resources available in foreign languages, students' ability to use technology causes less inhibition of online learning, in addition to communication, which takes a long time when interacting online (Putri, 2020). Other research has found that online learning improves students' skills, knowledge, and academic performance, but there is no character development (Waruwu, 2020). Learning from home can also contribute to mental disorders as a result of major disasters having a wider and longer impact compared to physical injuries; attention to mental health is much less, both in terms of procurement of personnel for planning and resources (Allsopp et al., 2019). Students' mental health, related to stress in relation to the COVID-19 pandemic, affects their learning achievement. Another research also found that the learning process greatly influenced students' learning achievement (Riswanto & Aryani, 2020). This research is particularly important considering that the COVID-19 pandemic is still an issue in Indonesia. The research results may shed light on the situation to allow stakeholders to make effective teaching and learning policies to address pandemic-related issues and obstacles, especially for higher education providers and students. Thus, this research aims to analyze the influence of studying from home, the ability to use technology, and stress levels on students' learning achievement during the

COVID-19 pandemic. This is a current gap in the research that we want to find answers for. The remainder of this article is structured as follows: Section 2 contains theories that support the research variables, and the research hypotheses; Section 3 gives the results of the research, in accordance with the methodology used; Section 4 contains a discussion of the research results; and Section 5 gives the study's conclusions.

## 2 LITERATURE REVIEW

### 2.1 Studying from Home (SFH)

On 24 March 2020, a Circular Letter of the Minister of Education 4/2020 was issued concerning the Implementation of Education Policy in the Emergency Period of the Spread of COVID-19. It covered the home studying process, the basic spirit of online studying, the focus of studying from home, the activities and tasks of learning from home, as well as the role of teachers in providing feedback. The role of teachers is very important for managing learning and ranges from planning, organizing, actuating, and evaluating in order to improve the effectiveness of the teaching and learning process during the COVID-19 pandemic (Saifulloh & Darwis, 2020). The quality of the information system, the speed of the media response, and the security of the system makes students satisfied with studying online (Faoziah & Sembiring, 2017, Pawirosumarto, 2016). All of these are part of the organization's service orientation, including organizational policies, procedures, and practices that encourage and maintain employees' good behavior [Liang et al., 2020; Haniar et al., 2021]. The policy of learning from home opens up opportunities for students to develop their potential in terms of regulating themselves while also being a way to protect themselves from COVID-19 (Huang et al., 2020). China was the first country to implement a school closure strategy to contain the spread of the COVID-19 virus. Studying from home has a number of aspects, including online learning, online communication, online administration services, online facilities, online assessment, online troubleshooting, and available online guides.

### 2.2 Stress Level

The COVID-19 outbreak resulted in a psychological crisis (Xiang et al., 2020) and psychological changes such as depression, anxiety, and a feeling of

insecurity due to the fear of contracting it; this was true for ordinary citizens as well as health workers (Zhang, 2020). Isolation and quarantine experiences lead to significant changes in terms of stress levels, confusion, anger, and anxiety. Anxiety can occur because a person has low self-esteem and therefore lower performance (Nusraningrum, 2012). People outside the quarantine area are afraid of contracting COVID-19 because of limited or incorrect knowledge (Brooks, 2020). Outbreaks of infections, such as severe acute respiratory syndrome (SARS), similar to the COVID-19 pandemic, have given health workers psychological burdens such as anxiety, depression, panic attacks, and psychotic symptoms (Lai, 2019). Stress levels have several indicators such as flexibility, fair treatment, sufficient time to complete tasks, sufficient equipment support, lack of conflict, and good motivation.

### 2.3 Ability to Use Technology

The use of technology in modern learning systems is inevitable, but there are still many students in Indonesia who do not have the skills to use technology adequately (Putri et al., 2020), and became part of modern life (Nusraningrum et al, 2019). The use of modern technology and equipment can improve students' interactive learning, help them to transfer knowledge more effectively, and is easy, comfortable, and fast (Raja & Nagasubramani, 2020). The use of technology became an absolute necessity when home learning policies were put in place around the world to prevent the transmission of COVID-19. This encouraged lecturers and students to become proficient at using computers and have a positive attitude, which are important factors in their success (Gressard & Loyd, 1986, Putri et al., 2020, Waruwu, 2020). Barriers to the use of technology include the lack of time, lack of access, lack of resources, lack of expertise, and lack of support (Butler & Sellbom, 2002) as well as incompatible hardware or software between school and home, poor Internet connectivity, and outdated software. The ability to use technology has several indicators, such as the ability to use online applications, the ability to conduct learning processes with technology, the ability to solve online technology problems, and the ability to develop creativity using technology and media.

### 2.4 Learning Achievement

Education develops an understanding of vision and motivation to behave in accordance with objectives

(Nusraningrum, 2018). The Learning outcomes are measurable achievements based on students' ability to comprehend learning stimuli and demonstrate related knowledge, skills, and abilities. Internal conditions interact with surface conditions during the learning and interaction process, resulting in learning achievement (Syaiful, 2012). There is a useful and significant correlation, both direct and indirect, between learning creativity, the use of instructional media, and learning achievement (Tirtarahardja & La Sulo, 2012). The results of teachers' assessment of students, based on research, has a significant correlation with improved student achievement (Wayne & Youngs, 2003). Outside influences such as the teacher, family, and classmates do not affect students' learning achievements, so teachers must create new learning innovations to increase students' motivation to achieve (Fitriwati, 2018). Learning achievement is a result of changes in behavior based on a person's ability (Nusraningrum, 2017). Student learning achievement indicators cover the following: learning evaluation in accordance with ability can help students complete a given task, the resulting task quality, and evaluations in accordance with the applicable regulations.

Hypothesis 1 (H1): Studying from home significantly affects stress level.

Hypothesis 2 (H2): Studying from home significantly affects the ability to use technology.

Hypothesis 3 (H3): Stress level significantly affect learning achievement.

Hypothesis 4 (H4): The ability to use technology significantly affects learning achievement.

Hypothesis 5 (H5): Studying from home significantly affects learning achievement.

Hypothesis 6 (H6): The ability to use technology significantly affects stress level.

Hypothesis 7 (H7): Stress significantly affects the ability to use technology.

## 3 METHODS

This research was causal and quantitative and done through field experiments. The data were collected

through an online survey. Survey instruments are typically in the form of self-administered questionnaires (Sugiyono, 2019). The hypotheses were tested by analysing the data via a statistical approach. This study is cross-sectional and the data were gathered just once over a period of weeks. The data were collected using a questionnaire with a purposive sampling technique. The population are students in higher education who have studied at home. The data collection was from December 2020 to March 2021. The number of samples was decided based on the theory of (Hair et al., 2017), i.e., the number of indicators multiplied by 10 for a total of 200. The data were analysed using Structural Equation Modelling and Partial Least Squares 3.0 (SEM PLS).

#### 4 RESULT AND DISCUSSION

The majority of respondents were women (59.8%) and that most lived in Jakarta (48%). The largest age bracket was 18–25 years old (69.16%), and the majority are still in semester 5 (8.88%) with a bachelor’s degree. The type of college was generally private (98.1%) and 71% of respondents had been studying from home for over 12 months.

The results of the frequency distribution average value of the studying from home variable of 3.25, which demonstrates that the respondents’ attitude toward studying from home was neutral in general. It can be said that the indicator with the lowest value for the studying from home variable was “absorb the material being taught properly like learning in class” with a value of 2.56 and the highest was for “assessment of learning achievement is still carried out during SFH” and “the management provides teaching and learning SOPs during SFH” with a value of 3.64. This indicates that assessment and standard operating procedures are seen by the respondents as the main indicators of studying from home.

The result of the frequency distribution average value of stress variable is 3.16, which demonstrates that the respondents value their stress is neutral in general. It can be said that the indicator producing the lowest value for the stress variable is “avoid stress because the burden placed on it still feels fair and reasonable, the same as before SFH” with a value of 2.52 and the highest indicator are “no stress at SFH because you don’t have personal problems with your family” with a value of 3.60. This indicates that “no stress at SFH because you do not

have personal problems with your family” is seen by the respondents as the primary indicator of stress.

The average value of the ability to use technology variable is 3.64, which demonstrates that the respondents value their ability to use technology in general. The indicator with the lowest value for the ability to use technology variable is “have learning experience with online applications prior to SFH” with a value of 3.43 and the highest is “stay creative by using various media/supporting technology for the success of the learning process” with a value of 3.71. This indicates that “stay creative by using various media/supporting technology for the success of the learning process” is seen by the respondents as the primary indicator of ability to use technology.

The average value of the learning achievement variable is 3.48, which demonstrates that the respondents place neutral value on their learning achievement in general. The indicator with the lowest value for learning achievement variable is “still be able to complete tasks of the same quality before SFH” with a value of 3.40 and the highest is “the results of evaluating online learning activities that have been carried out are in accordance with the provisions of the campus” with a value of 3.59. This indicates that “the results of evaluating online learning activities that have been carried out are in accordance with the provisions of the campus” is seen by the respondents as the primary indicator of learning achievement.



Figure 1: Path Analysis Outer Loadings Output 1.

It can be seen from Figure 1 that all variables’ indicators have outer loadings above 0.5, except for SFH3, SFH4, SFH5, SFH7, and SS1. Indicators that have outer loadings lower than 0.5 will be eliminated. In the second output of Figure 2, all of the indicators have outer loadings higher than 0.5. This means that all of the indicators are valid.



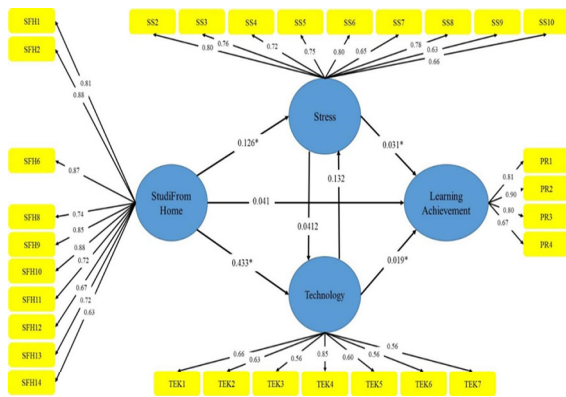


Figure 2: Path Analysis Outer Loadings Output 2.

Based on the output of the discriminant validity test of the modified model of each of the indicator's outer loadings on the associated constructs exceeds its cross-loadings. Thus, it can be concluded that studying from home, stress, the ability to use technology, and learning achievement constructs have no discriminant validity problem.

Table 1 demonstrates that each variable had Cronbach's alpha and composite reliability values higher than 0.6, with ability to use technology values the highest and stress values the lowest.

Table 1: Cronbach's alpha and composite reliability.

Variable	Cronbach's Alpha	Composite Reliability
Studying from Home	0.732	0.741
Stress level	0.688	0.702
Ability to Use Technology	0.851	0.867
Learning Achievement	0.713	0.744

The relationship between constructs according to the R<sup>2</sup> value is as follows:

- The R<sup>2</sup> value of the stress variable was 0.731. This means that 73.1% of the stress variable was contributed by studying from home.
- The R<sup>2</sup> value of ability to use technology was 0.811. This means that 81.1% of the ability to use technology variable was contributed by studying from home.
- The R<sup>2</sup> value of learning achievement was 0.803. This means that 80.3% of the learning achievement variable was contributed by studying from home.

Table 2: Hypothesis testing.

Hypothesis	Original sample	t-statistic	p-value
<b>Direct Effect</b>			
studying from home → stress	0.126	2.321	0.021
stress → learning achievement	0.031	2.421	0.013
studying from home → learning achievement	0.041	1.764	0.083
studying from home → ability to use technology	0.443	2.521	0.014
ability to use technology → learning achievement	0.019	2.316	0.019
stress → ability to use technology	0.041	1.432	0.156
ability to use technology → stress	0.132	1.023	0.431
<b>Indirect Effect</b>			
studying from home → stress	0.126	2.321	0.021
stress → learning achievement	0.031	2.421	0.013
studying from home → stress → ability to use technology	0.008	2.391	0.016
studying from home → ability to use technology → stress → learning achievement	0.268	2.761	0.006

In this study, out of the seven hypotheses there were four significant hypotheses and three insignificant hypotheses. The standard error used was 0.05 or 5%; when the value is below 0.05, it expresses significance. Indirect effect testing or intervening hypothesis on stress level, and the ability to use technology on learning achievement have a positive and significant relationship.

- The effect of studying from home on students' stress level was proven to be positive and significant. This finding reinforces the results of previous studies found that studying from home during the COVID-19 pandemic allowed students to manage themselves to avoid contracting COVID-19 (Huang, et al., 2020), and that studying from home affected stress levels. Studying from home gives students experience of isolation and quarantine, which causes confusion, anger, and anxiety about contracting COVID-19, often due to incorrect knowledge (Arifa, 2020).

- 2) Similarly, the effect of studying from home on the ability to use technology was also found to be positive and significant. Studying from home encourages lecturers and students to be more proficient at using information and communication-technology and these also enhance teaching and learning processes (Chizmar et al., 1986). Stated that the use of technology became an absolute necessity when home learning policies were accepted around the world to prevent the transmission of COVID-19 (Huang et al., 2020).
- 3) The effect of stress level on learning achievement was proven to be positive and significant, and our findings reinforced the results of previous studies. Stress responses such as confusion, anxiety, and anger while in quarantine situations due to COVID-19 have been significantly beneficial in terms of generating creativity and learning achievement (Tirtarahardja & La Sulo, 2012). This correlation was useful for improving learning achievement (Wayne & Youngs, 2003). The experiences of isolation and quarantine cause significant changes in the stress levels of learners and teachers due to confusion, anger, anxiety, and fear of contracting the disease. Nonetheless, the experience has caused learners to take charge of their education and be more responsible for their learning process, including the usage of instructional media either directly or indirectly related to learning achievement.
- 4) The positive effect of ability to use technology on learning achievement has been proven to be significant and this finding is in line with the results of previous studies. The use of modern technology can improve students' interactions and allow them to explore more interesting areas as well as to transfer their knowledge more effectively. It can also make their work easy, comfortable, and faster (Raja & Nagasubramani, 2020), resulting in higher learning achievement (Syaiful, 2012). An increasingly connected world with unpredictable possibilities (Robbins et al., 2021) requires students to improve their ability to use technology to lower their stress levels and attain higher learning achievement.
- 5) The effect of studying from home on learning achievement was proven to be positive and significant, which reinforced the results of previous studies. Studying from home is an opportunity for students to increase their potential and self-motivation and at the same time protect themselves from COVID-19 (Robbins et al., 2021). This significantly increases learning creativity and both directly and indirectly correlates with learning achievement (Tirtarahardja & La Sulo, 2012); based on earlier research, it has a significant correlation with improved student achievement (Wayne & Youngs, 2003).
- 6) The effect of ability to use technology on stress level was proven to be positive and significant; this finding reinforces the results of previous studies. The use of technology in modern learning systems can improve student interaction, help them to transfer knowledge more effectively, and is easy, convenient, and fast (Raja & Nagasubramani, 2020). So, when students have to be isolated because of studying from home, the ability to use information technology can mitigate the stress related to confusion, anger, and anxiety about contracting COVID-19 (Arifa, 2020).
- 7) The effect of stress on the ability to use technology was proven to be positive and significant; this reinforces the results of previous studies. Stress caused by isolation at home can prompt students to develop the ability to use technology to overcome problems that arise when learning from home (Chizmar & Williams, 2001). This encourages lecturers and students to become proficient at using computers; the positive attitude and reliability of lecturers in terms of the use of computers is a success factor for teaching (Gressard & Loyd, 1986; Putri et al., 2020; Waruwu, 2020).

## 5 CONCLUSIONS

The effect of studying from home on stress level, ability to use technology, and learning achievement is positive and significant, indicating that the COVID-19 pandemic has forced students to cope with isolation and embrace the new norms of a virtual learning environment. Similarly, the ability to use technology must be strengthened in order for the learning process to run smoothly. Apparently, despite the stressful situation, the data indicate that students manage to handle the technological challenges and improve their learning achievement. When students are under pressure to learn from home, they manage to cope and improve their ability to use the technology. The business environment is volatile and constantly changing due to the COVID-

19 pandemic. Changes are happening very quickly, especially in terms of digital use, and more activities are done at home, which requires new ways of thinking, creativity, and appropriate innovations to adapt to new situations. This is crucial for students and educational institutions to maximize their improvement and output.

Future areas of research that we recommend are:

- 1) Lecturers must be creative in terms of online teaching and delivery so that students can embrace the learning process and absorb knowledge effectively. Although virtual, the learning experience must still be enjoyable and meaningful. The stresses related to learning from home can be mitigated through coping mechanisms as well as a user-friendly environment. The evaluation of learning should be adjusted to the conditions so that students can still excel.
- 2) With the change from face-to-face learning to remote learning, the quality of experience for stakeholders, i.e., students, should not change under any circumstances.

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