

Do Technology Utilization and Lecturer Competence Matter for Online Learning? The Mediating Role of Independent Learning

Ratieh Widhiastuti, Wisudani Rahmaningtyas, Nina Farliana, Indrawati
Faculty of Economics, Universitas Negeri Semarang
Corresponding email: ratieh.widhiastuti@mail.unnes.ac.id

Abstract: This study examines the effect of technology utilization and lecturer competence on the effectiveness of online learning with independent learning as a mediating variable. The population in this study were students of the Economics Education Department, Universitas Negeri Semarang. The sampling technique involved in this study is saturated sampling techniques which consist of 120 students. The data was further analyzed using descriptive statistics and path analysis. The results showed that technology utilization did not affect the effectiveness of online learning. Lecturer competence and learning independence had a positive and significant effect on the effectiveness of online learning. The technology utilization did not affect learning independence, while lecturer competence positively impacts learning independence. Additionally, independent learning failed in mediating the effect of technology utilization, but it can mediate the effect of lecturer competence on the effectiveness of online learning. From these findings, lecturers should provide more interesting learning materials so that the effectiveness of online learning increases and can foster independent learning in students.

Keywords: Effectiveness of online learning, Learning independence, Lecturer competence, Technology utilization

INTRODUCTION

The emergence of COVID-19 cases in Indonesia has hampered all sectors of life, one of which is the education sector. The existence of the COVID-19 virus has resulted in a change in the learning system that was initially held face-to-face in the classroom to switch to online learning. Eliminating face-to-face learning activities and being replaced with online learning is one solution so that teaching and learning activities can still be carried out (Siron et al., 2020). Online learning is implemented remotely through online classes with the aim of students can still access learning during the COVID-19 pandemic (Maulana & Hamidi, 2020).

Massive changes in the learning system have impacted the world of education. Consequently, students feel anxiety with changes in the learning system, and there is uncertainty about the application of online learning (Zhang et al., 2020). The shifting from conventional to online learning sometimes leads to insufficient learning goals. There are still many obstacles experienced by students in online learning, especially in practicum courses. Constraints experienced by students include technological limitations such as cell phones and laptops that do not support learning activities, unstable internet networks to access learning, and the low quality of lecturers' services so that the material received cannot be understood optimally (Nurgiansah, 2010).

One of the practicum courses that students of the Economics Education Department at Universitas Negeri Semarang must be carried out is the computer

course. The computer course emphasizes practice in a computer laboratory using the application program, where students are expected to understand the implementation of a computerized program through an economic practicum model (Widayati et al., 2020). However, during the COVID-19 pandemic, practicum activities were carried out online, so students had to continue participating in practicum activities with minimal technology and limited direct instruction from lecturers. Lecturers cannot provide instruction on the steps in operating the computer application directly and can only use technology for teaching media which makes students still find it challenging to understand practicum material. In addition, the limited discussion and communication activities between lecturers and students resulted in less effective.

Data reported from Boulevarditb (2020) remarked that students related to the implementation of practicum during the COVID-19 pandemic. Approximately 90% of respondents preferred practicum held offline, while the remaining 10% of respondents chose online practicum. The fundamental rationale is that among students arose because the assistance that would be carried out during the online practicum was considered less interactive, for example, corrections cannot be given directly. Many respondents also answered that direct practicum would be more emotional, the atmosphere was tenser, time-driven made the practicum feel more exciting, and offline learning skills could be more embedded in the brain.

The data is also in accordance with the initial research conducted by the researcher. Preliminary data collection was carried out on 30 students of Economics Education, Faculty of Economics, Universitas Negeri Semarang, in the class of 2018 who had received online computer practicum courses. About 76.7% of respondents stated that during online lectures, the computer practicum course was considered less effective, and 23.3% of respondents stated that the online practicum course could be implemented well. In addition, 96.7% of respondents agreed when the computer practicum course was carried out face-to-face or directly, and the remaining agreed if the computer practicum course was carried out online.

Cybernetic learning theory by Landa et al. (1958) is linked with the development of information technology and science, and learning is information processing. In the online teaching and learning process, learning can occur with technology. Technology can be applied as a learning medium to provide information and can be used as a learning resource to find information related to learning materials. In addition, the convergence learning theory, which was developed in 1871-1938 by Louis William Stern, states that there are two factors that influence development in humans, namely innate or internal factors and environmental or external factors (Lamiell et al., 2021). The development of healthy abilities occurs when there is a combination of environmental or external factors with the natural potential or internal factors of a person so that both internal and external factors affect a person's development in the learning process. In this study, the internal factor is learning independence, while the external factor is lecturer competence.

According to Pangondian et al. (2019), the effectiveness of online learning is influenced by technology, teacher characteristics, and student characteristics. Indeed, Mitasari et al. (2020) stated that the factors that influence the effectiveness

of online learning are human resources consisting of teacher characteristics and student characteristics, technology, and infrastructure. From those previous studies, the factors that influence the effectiveness of online learning include internal factors in the form of student characteristics and external factors in the form of lecturer characteristics, technology utilization, and infrastructure. Internal and external factors that become the focus of this research are student characteristics in the form of independent learning, lecturer characteristics in the form of lecturer competence, and technology utilization.

Technology is an intermediary for meetings between lecturers and students in online classes. Advances in information technology can expand the educational process, which at first could only be carried out face-to-face and limited to the same room, but during the COVID-19 pandemic, learning no longer took place in the same room but took place in the same technology so that technology can facilitate all needs in the teaching and learning process. This statement is supported by research by Lestari (2018), which remarked that technology in education is a system that is used to support learning so that the desired results are achieved. Prior studies by Sun and Chen (2016); Ratnasari et al. (2021); Pakpahan and Fitriani (2020) showed that technology utilization affected the effectiveness of online learning. However, it is different from research conducted by Zia (2020) that technology did not have a significant effect on online learning because it created problems related to adaptation to the technology because students had always been physically present in the classroom.

In addition to technology utilization, lecturer competence also affects the effectiveness of online learning. The Indonesian Government Regulation Number 74 of 2008 mentioned that lecturers are required to have competencies that can be applied during learning activities. Furthermore, Hollweck and Doucet (2020) noted that the competence of educators during a pandemic can be seen from how an educator thinks critically in the application of teaching practices and is always responsible for providing the best teaching for their students. Sun and Chen (2016); Fitria (2021); Maulana and Hamidi (2020) also revealed that the competence of lecturers had a significant effect on the effectiveness of online learning. However, different results were found in Sudrajat (2020), which said that teacher competence had no effect on the effectiveness of online learning where teacher competencies related to competencies of literacy, science and technology mastery, competencies of classroom management skills, and communication and social competencies were not optimal.

Judging from the results of the gap phenomena and research gap described previously, the researcher considers that the variable of learning independence can be used as a mediating variable because student learning independence affects the effectiveness of online learning. In online learning, students are required to prepare a learning system independently. This statement is supported by Carter and Rice (2020), which showed that student learning independence resulted in the effectiveness of online learning. In addition, the research results of Wang et al. (2013) stated that independent learning could improve learning outcomes in online learning so that learning effectiveness was achieved. The results of research by Koroh (2020); Cai et al. (2020) also revealed that learning independence had a positive and significant effect on the effectiveness of online learning.

METHODS

This research was adopted quantitative research with the survey methods. The population in this study were the students of Economics Education, Faculty of Economics, Universitas Negeri Semarang, class of 2018. This study involved 120 students as the sample with a saturated sampling technique. The dependent variable of this study was the effectiveness of online learning for computer courses, while the independent variable of this study was the technology utilization and lecturer competence, and the mediating variable in this study was independent learning.

The effectiveness of online learning for computer courses was measured using instruments of Usman (2013) which consists of actively involving students, attracting student interest and attention, generating student motivation, the principle of individuality, demonstration in teaching. Technology utilization was measured using indicators from Utari (2013), which consists of student knowledge about technology, technology for solving learning problems, technology as a learning resource, technology as a medium of social interaction, technology in the learning process. While the variable of lecture competence was measured by using indicators from Murti and Prasetyo (2018) and according to RI Law No. 14 of 2005, which consists of (1) pedagogical competence, personality competence, professional competence, social competence. Lastly, learning independence was calculated using indicators from Febriastuti et al. (2013), covering self-confidence, responsibility, initiative, discipline.

The data collection method was in the form of a questionnaire provided using Google form. The data analysis method used descriptive statistical analysis and path analysis. However, previously, the research data had been tested for feasibility by using validity and reliability tests, as well as classical assumption tests consisting of normality test, linearity test, multicollinearity test, and heteroscedasticity test.

RESULTS & DISCUSSION

The following is a descriptive statistical table on the effectiveness of online learning for computer courses, technology utilization, lecturer competence, and independent learning (see Table 1). Based on Fable 1, it was known that for the variable of the effectiveness of online learning for computer courses, the minimum value was 56, the maximum value was 85, and the mean was 71.1917, so that the variable of the effectiveness of online learning for computer courses was included in the high category. Additionally, the technology utilization variable has the minimum value of 57, and the maximum value was 100. The mean was 86.3667, so the technology utilization variable was included in the very high category. Indeed, the lecturer competence variable has the minimum value of 47, the maximum value was 75, and the mean was 64.4583. Lastly, learning independence has the minimum of 42 with maximum of 75, and the mean was 61.4750 so the learning independence variable was included in the high category.

Table 1. Descriptive Statistics of Technology Utilization Variable

	N	Minimum	Maximum	Mean	Std. Deviation
X1	120	57.00	100.00	86.3667	8.16421
X2	120	47.00	75.00	64.4583	6.46892
Y	120	56.00	85.00	71.1917	6.72546
Z	120	42.00	75.00	61.4759	6.41946
Valid N (listwise)	120				

Before conducting the path analysis test and t-test, it is necessary to carry out prerequisite tests and classical assumption tests, which include normality test, linearity test, multicollinearity test, and heteroscedasticity test. Normality test was performed by using the One-Sample Kolmogorov-Smirnov Test. In regression model 1, the significance value of Asymp. Sig (2-tailed) was 0.200, and in regression model 2, the significance value of Asymp. Sig (2-tailed) was 0.056. This value was greater than 0.05, which means the data was normally distributed.

The linearity test determines whether the relationship between the independent variable and the dependent variable is linear or not. The basis for making the decision is when $c2 \text{ count} < c2 \text{ table}$, then the data is linear. In regression model 1, it was known that $c2 \text{ count} = 3.12$ and $c2 \text{ table} = 142.138160$. In regression model 2, it was known that $c2 \text{ count} = 0.84$ and $c2 \text{ table} = 141.03$. Thus, it can be concluded that the two models were linear. The results of the multicollinearity test on the regression models 1 and 2 showed that each independent variable had a tolerance value of more than 0.1 and a VIF value of less than 10. This indicates that the two regression models did not have multicollinearity symptoms. While the results of the heteroscedasticity test, it was known that the significance value of all independent variables was greater than 0.05, so it can be concluded that the two regression models did not have heteroscedasticity symptoms.

Path analysis in this study was used to analyze the effect of technology utilization and lecturer competence on the effectiveness of online learning for computer courses through independent learning as a mediating variable. The results of the regression analysis can be seen in Table 2.

Table 2. Results of Regression Analysis with the Effectiveness of Online Learning

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	14.774	4.875		3.031	0.003
	X1	0.149	0.083	0.180	1.780	0.078
	X2	0.309	0.114	0.297	2.718	0.008
	Z	0.385	0.084	0.368	4.573	0.000

Notes (s) a. Dependent Variable: Y

From Table 2, the regression equation model 1 was obtained, namely: $Y = 14.774 + 0.180X1 + 0.297X2 + 0.368Z + 0.672 e$. The results of the regression equation analysis showed that the X1 regression coefficient was 0.180. This explained that each increased in the variable of technology utilization by one unit; it would increase the effectiveness of online learning for computer courses by

0.180 with the assumption that the lecturer competence variable and independent learning remained. The lecturer competence variable showed that the regression coefficient was 0.297. This showed that each increase in the lecturer competence variable by one unit; it would increase the effectiveness of online learning for computer courses by 0.297 with the assumption that the variables of technology utilization and independent learning were fixed. The learning independence variable showed that the regression coefficient was 0.368. This showed that each increased in the learning independence variable by one unit; it would increase the effectiveness of online learning for computer courses by 0.368 with the assumption that the variables of technology utilization and permanent lecturer competence.

Table 3. Results of Regression Analysis with Independent Learning as Dependent Variable

Model	Unstandardized Coefficients		Standardized Coefficients		t	Sig.
	B	Std. Error	Beta			
1	(Constant)	19.222	5.047		3.809	0.000
	X1	0.099	0.091	0.126	1.083	0.281
	X2	0.523	0.115	0.527	4.551	0.000

Note(s): a. Dependent Variable: Z

From Table 3, the regression equation model 2 was obtained, namely: $Z = 19.222 + 0.126X_1 + 0.527X_2 + 0.775 e_1$. The results of the regression equation analysis showed that the regression coefficient of the technology utilization variable was 0.126. This explained that each increase in the variable of technology utilization by one unit; it would increase learning independence by 0.126 with the assumption that the variable was permanent lecturer competence. In the variable of lecturer competence, it showed that the regression coefficient was 0.527. This showed that each increase in the lecturer competence variable by one unit; it would increase learning independence by 0.527 with the assumption that the variable of technology utilization was fixed. The model for path analysis is presented in Figure 1.

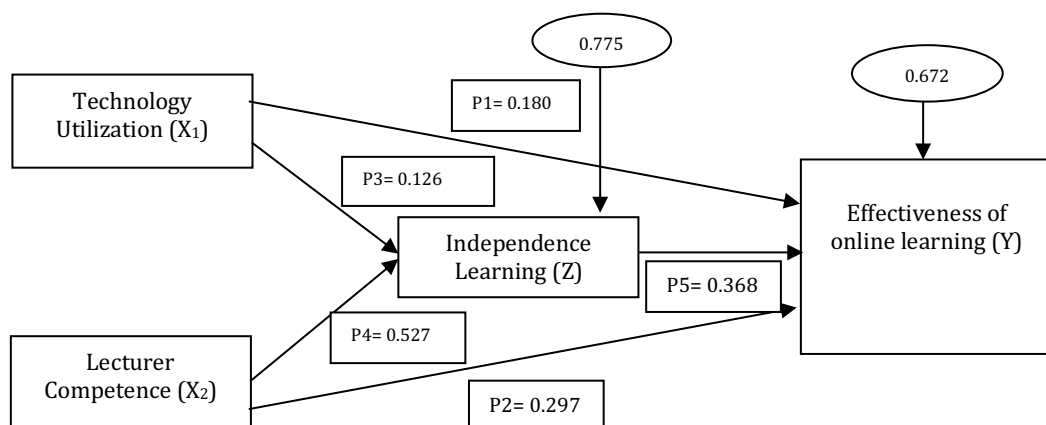


Figure 1. Path Analysis Model

Figure 2 explains that the total effect of the independent variable on the dependent variable through the mediating variable, namely the direct effect of technology utilization on the effectiveness of online learning for computer courses, was 0.180. The magnitude of the indirect effect of technology utilization on the effectiveness of online learning for computer courses was $0.126 \times 0.368 = 0.046$. Thus, the total effect of technology utilization on the effectiveness of online learning for computer courses through independent learning was $0.180 + 0.046 = 0.226$ or 22.6%. The direct effect of lecturer competence on the effectiveness of online learning for computer courses was 0.297. The magnitude of the indirect effect of lecturer competence on the effectiveness of online learning for computer courses was $0.527 \times 0.368 = 0.193$. The total effect of lecturer competence on the effectiveness of online learning for computer courses through independent learning was $0.297 + 0.193 = 0.49$ or 49%.

The Effect of Technology Utilization on the Effectiveness of Online Learning

The statistical calculation showed that the technology utilization variable had a t-count value of 1.780 with a significance of $0.078 > 0.05$, indicating that the technology utilization did not significantly affect the effectiveness of online learning. Based on the results of descriptive analysis, an average value of 86.36 was obtained, where this value was in a very high category. This implicates that students obtained maximum technology utilization in online learning activities for computer courses. However, this had not been able to make online learning in computer courses run effectively. With online practicum learning, students are required to have and prepare learning facilities such as laptops or computers independently. However, there are still students who did not have laptops or computers to carry out practicum activities, so with these limitations, students could not use technology to learn optimally.

Another reason why the technology utilization did not affect the effectiveness of online learning in computer courses is that the discussion process between lecturers and students in learning forums was limited, students did not ask the lecturers when they had difficulties through various technologies that had been provided for learning activities such as Zoom, Google Classroom, E-mail, WhatsApp, or ELENA and students did not look for other sources on the internet such as E-books to support their learning activities, resulting in a lack of student understanding regarding computer learning materials.

The results of this study were not in line with the cybernetic theory proposed by Landa et al. (1953); Sani (2013). Cybernetic theory suggests that the learning process emphasizes technology utilization to obtain information so that the learning process is more effective, efficient, and productive. Based on this assumption, a student must use available technology to obtain information quickly and precisely and be able to organize information in the learning process. This finding is on the contrary by Ratnasari et al. (2021), which stated that there was a strong relationship and effect between online learning technology and learning effectiveness. However, this study confirms a preliminary study by Zia (2020) and Hikmat et al. (2020), which stated that technology did not have a positive and significant effect on the effectiveness of online learning.

The Effect of Lecturer Competence on the Effectiveness of Online Learning

The variable of lecturer competence obtained a t-count value of 2.718 with a significance of $0.008 < 0.05$, which means that the lecturer's competence had a significant effect on the effectiveness of online learning for computer courses. It can be concluded that there was a significant positive effect of lecturer competence on the effectiveness of online learning. The results of this study were significant and relevant to the convergence learning theory, which states that one of the factors that influence development in humans is an external factor or environmental factor (Syah, 2008). External factors that can affect the development of students related to the understanding of the material, namely the lecturer's competence.

The effectiveness of learning computer courses is influenced by the ability of lecturers to carry out the teaching and learning process. When a lecturer has good competence to plan and manage learning according to the existing situation, learning will run effectively because it can increase the abilities and knowledge that students will have. The results of this study are in agreement with Sutisna and Widodo (2020), which revealed that pedagogic competencies, personality competencies, personal competencies, and social competencies possessed by teachers had a role in the implementation of online education. The same research was put forward by Maulana and Hamidi (2020); Innayah (2020), who also found that lecturer competence had a positive and significant effect on the effectiveness of online learning.

The Effect of Independent Learning on the Effectiveness of Online Learning

The independent learning variable obtained a t-value of 4.573 with a significance of $0.000 < 0.05$, which means that learning independence had a positive and significant effect on the effectiveness of online learning. The results of this study were in line with the convergence learning theory, which states that in addition to being influenced by external or environmental factors, the development of an individual's self is also influenced by internal factors (Syah, 2008). An internal factor that supports the development of an individual in students, in particular, is independent learning. With the existence of independent learning in students, it will result in an increase in knowledge and expertise from something that is learned independently.

During online learning to increase knowledge and skills in operating applications, students must study the material independently by utilizing available learning resources when experiencing difficulties. Without the existence of independent learning in students, students' skills regarding the application will not develop. The results of this study were in line with the research conducted by Cai et al. (2020) during the COVID-19 pandemic where learning took place online, so students must be able to set their own learning goals, manage their learning progress through predetermined materials, choose skills and methods, monitor all learning activities, and evaluate themselves so that learning effectiveness was achieved. A study conducted by Koroh (2020); Wang et al. (2013) suggests that learning independence had a positive and significant effect on the effectiveness of online learning.

The Effect of Technology Utilization on Independent Learning in Online Learning

The technology utilization variable had a t-value of 1.083 with a significance of $0.281 > 0.05$, which means that the technology utilization had no significant effect on learning independence. The technology utilization by students could not foster independent learning in students because students tended to use technology to play social media rather than to learn, such as looking for E-books, modules, learning videos as well as sample questions and solutions on the internet as learning support materials so that there were still many students who had not been able to operate the Application. As a result of the lack of independent learning that students had, students had a dependence on others, such as there were still students who asked for answers to friends via the WhatsApp application when there were assignments or computer exams.

The results of this study were not in line with cybernetic learning theory, which considers that one of the most important things in determining the occurrence of the learning process is the existence of technology that will produce information (Sani, 2013). When students cannot utilize technology optimally as a source of independent learning, it results in students getting less information about computer course materials. This was also not in line with the convergence learning theory, which assumes that development in humans is influenced by heredity (innate) or internal factors (Syah, 2008). The availability of various technologies such as YouTube, e-books, and modules that could make it easier for students to study independently did not affect students to apply independent learning in themselves so that understanding related to the material could not develop.

The results of this study were in contrast with research conducted by Rahmanita (2020), which stated that information and communication technology had a positive effect on independent learning where technology made it easier for students to find information and solve problems in learning through internet sources. However, the results of this study were in line with research conducted by Sari (2021) which also concluded that online learning by utilizing WhatsApp did not affect students' independent learning attitudes.

The Effect of Lecturer Competence on Independent Learning in Online Learning

The variable of the lecturer competence obtained a t-value of 4.551 with a significance of $0.00 < 0.05$, which means that the lecturer competence had a significant effect on learning independence. The results of this study were in line with the theory of convergence, which reveals that development in humans is a combination of heredity (innate) or internal factors with the human environment where humans grow and develop or external factors (Syah, 2008). These two factors greatly affect the success of learning in students. External factors directly related to students during the learning process are the lecturer's competence and internal factors in the form of independent learning.

Lecturers who have good competence can increase the learning independence of their students. Lecturers can use learning methods that have been designed according to student conditions, such as lecturers providing a stimulus in

the form of learning videos and modules then students are given individual assignments, the attitude of the lecturers who are always open to answer student questions and always motivate students to study independently will foster independent learning in students. The results of this study were in line with the research conducted by Karlen et al. (2020), who found that professional teacher competence affected student learning independence, pedagogic competence also had a role in creating student learning independence. Indeed, Hermawati and Andayani (2020) found that teacher pedagogic competence affected student independence. Similarly, Aziz and Basry (2017) also found that there was a positive and significant relationship between teacher competence and student learning independence.

The Effect of Technology Utilization on the Effectiveness of Online Learning through Independent Learning

Based on the calculations, it was known that the effect of technology utilization on the effectiveness of online learning for computer courses was 0.180 or 18%, and the indirect effect of technology utilization on the effectiveness of online learning for computer courses was 0.046 or 4.6%. Based on the results of manual calculations, the value of t count = 1.3142, and the results of the Sobel test calculations through the Sobel Test application obtained a value of 1.3202. The value obtained was smaller than the t -table, namely 1.65810, and the one-tailed probability value was 0.093, which was greater than the significance value of 0.05. Based on the independent learning test results, it could not mediate the effect of technology utilization on the effectiveness of online learning for computer courses.

The fundamental rationale that causes of the research results was not in line with the initial hypothesis and theoretical review because of the various kinds of learning media that had been prepared by the lecturers, such as modules and learning videos made by the lecturers or those already available on YouTube and various kinds of materials and examples of questions on the internet that students could easily access, it was underutilized by students for their learning activities due to the inadequate learning independence of students. In addition, when learning process, there were still many students who depended on friends, such as asking for answers via WhatsApp social media when there were assignments or exams given by the lecturer. Technology that was not used optimally in the learning process and the absence of an independent learning attitude that students had would not be able to create effectiveness in online learning.

The Effect of Lecturer Competence on the Effectiveness of Online Learning through Independent Learning

Based on the calculations, it was known that the effect of lecturer competence on the effectiveness of online learning for computer courses was 0.297 or 29.7%, and the indirect effect of lecturer competence on the effectiveness of online learning for computer courses was 0.193 or 19.3%. Based on the results of manual calculations, the t -value = 3.163 and the results of the Sobel test calculation through the Sobel Test application obtained a value of 3.1666. The t -count value was greater than the t -table, which was 1.65810. The one-tailed probability value was 0.000, which was smaller than the significance value of 0.05. Based on the

independent learning test results, it could mediate the effect of lecturer competence on the effectiveness of online learning for computer courses.

Lecturers who had good competencies so that they could practice their four competencies, including pedagogic, professional, social, and personal competencies in the online learning process, were not necessarily able to make computer learning run effectively if it was not accompanied by an attitude of independent learning in students. This was because if students could not independently review material that felt difficult and had not been understood after the lecturer conveyed during the lesson, students could not master the Application, resulting in low learning outcomes. It was different if students had high learning independence in their learning process, then students would try to re-learn material that had not been understood in order to improve their skills in using the Application so that in this case it would improve their learning outcomes and achieve the effectiveness of online learning.

CONCLUSIONS

Based on the results of the research that has been described, it can be concluded that the technology utilization had no effect on the effectiveness of online learning for students of Economics Education, class of 2018, lecturer competence and learning independence had a positive and significant effect on the effectiveness of online learning. The technology utilization did not affect learning independence in online learning, while lecturer competence affected learning independence in online learning. In addition, independent learning could not mediate the effect of technology utilization on the effectiveness of online learning but it can mediate the relationship between lecturer competence on the effectiveness of online learning. Suggestions that can be given are to increase the effectiveness of online learning is that lecturers should make interesting and creative online learning materials so that students can understand learning materials easily. The competencies possessed by lecturers need to be maintained and even improved through training, education and training, and educational seminars. To increase learning independence in students, students have a high sense of curiosity regarding the subjects being studied, and lecturers must make interesting teaching materials so that students have the desire to review the material that has been taught. For further researchers who raise similar topics, it is hoped that they will be able to redevelop the research model by adding new independent variables outside of the or involving the lecturer competence variable as a mediating variable.

REFERENCES

- Arif, A. R. H., & Naufal, M. D. (2020). Praktikum dalam Jaringan? *Boulevarditb*. <https://boulevarditb.com/2020/09/19/praktikum-dalam-jaringan/>
- Aziz, A., & Basry, B. (2017). Hubungan antara kompetensi guru dan kepercayaan diri dengan kemandirian siswa SMPN 2 Pangkalan Susu. *Jurnal Psychomutiara*, 1(1), 15-29.

- Cai, R., Wang, Q., Xu, J., & Zhou, L. (2020). Effectiveness of students' self-regulated learning during the COVID-19 pandemic. *Sci Insigt*, 34(1), 175–182. <https://doi.org/10.15354/si.20.ar011>. Author
- Carter, R. A., & Rice, M. (2020). Self-regulated learning in online learning environments: strategies for remote learning. *Information and Learning Sciences*, 121(5), 321–329. <https://doi.org/10.1108/ILS-04-2020-0114>
- Febriastuti, Y. D., Linuwih, S., & Hartono. (2013). Peningkatan Kemandirian belajar siswa SMP Negeri 2 Geyer melalui pembelajaran inkuiri berbasis proyek. *Unnes Physics Education Journal*, 2(1), 27–33. <https://doi.org/10.15294/upej.v2i1.1617>
- Fitria, T. N. (2021). Lecturer's pedagogic competence: Teaching English in online learning during pandemic Covid-19. *Journal of English Education*, 6(2), 100–108. <https://doi.org/10.31327/jee.v6i2.1569>
- Hermawati, L. I., & Andayani, E. (2020). Kompetensi pedagogik guru, model discovery learning, dan gaya belajar terhadap kemandirian belajar. *Jurnal Penelitian Dan Pendidikan IPS (JPPI)*, 14(1), 22–30. <https://doi.org/https://doi.org/10.21067/jppi.v14i1.4761>
- Hikmat, Hermawan, E., Aldim, & Irwandi. (2020). Efektivitas Pembelajaran daring selama masa pandemi Covid-19: Sebuah survey online. *Digital Library, UIN Sunan Gunung Djati, Bandung*, 1–7. <http://digilib.uinsgd.ac.id/30625/>
- Hollweck, T., & Doucet, A. (2020). Pracademics in the pandemic: Pedagogies and professionalism the pandemic. *Journal of Professional Capital and Community*, 5(3), 295–305. <https://doi.org/10.1108/JPC-06-2020-0038>
- Innayah, R. (2020). Pengaruh media pembelajaran online, motivasi belajar, dan kompetensi dosen terhadap kualitas pembelajaran. *Composites Part A: Applied Science and Manufacturing*, 8(2), 38–47. <https://doi.org/http://dx.doi.org/10.24127/pro.v8i2.3308>
- Karlen, Y., Hertel, S., & Hirt, C. N. (2020). Teachers' Professional competences in self-regulated learning: An approach to integrate teachers' competences as self-regulated learners and as agents of self-regulated learning in a holistic manner. *Frontiers in Education*, 5(159), 1–20. <https://doi.org/10.3389/educ.2020.00159>
- Koroh, T. (2020). Respons mahasiswa terhadap pembelajaran daring dan kemandirian belajar mahasiswa selama pandemi Covid-19. *Widyadewata: Jurnal Balai Diklat Keagamaan Denpasar*, 3, 54–59.
- Landa, J. S. (1958). A critical analysis of the Bennett movement. Part I. *The Journal of Prosthetic Dentistry*, 8(4), 709–726.
- Lestari, S. (2018). Peran teknologi dalam pendidikan di era globalisasi. *Jurnal Pendidikan Agama Islam*, 2(2), 94–100. <https://doi.org/https://doi.org/10.33650/edureligia.v2i2.459>
- Maulana, H. A., & Hamidi, M. (2020). Persepsi mahasiswa terhadap pembelajaran daring pada mata kuliah praktik di pendidikan vokasi. *Jurnal Pendidikan*, 8(2), 224–231. <https://doi.org/10.26618/equilibrium.v8i2.3443>
- Mitasari, Z., Istikomayanti, Y., & Setiawan, R. (2020). Pembelajaran daring di Perguruan Tinggi: Persepsi dan faktor penentu. *Bioedukasi*, 12(1), 84–91.
- Murti, R. W., & Prasetyo, A. P. (2018). Pengaruh kompetensi dosen terhadap prestasi akademik mahasiswa Fakultas Ekonomi dan Bisnis Telkom

- University. *Jurnal Penelitian Pendidikan*, 18(2), 94–102.
<https://doi.org/10.17509/jpp.v18i2.12950>
- Nurgiansah, T. H. (2021). Efektivitas pembelajaran daring di masa pandemi COVID-19 bagi mahasiswa Universitas PGRI Yogyakarta. *Jurnal Basicedu*, 5(1), 367–375. <https://doi.org/https://doi.org/10.31004/basicedu.v5i1.669>
- Pakpahan, R., & Fitriani, Y. (2020). Analisa pemafaatan teknologi informasi dalam pembelajaran jarak jauh di tengah pandemi virus corona Covid-19. *JISAMAR (Journal of Information System, Applied, Management, Accounting and Researh)*, 4(2), 30–36.
- Pangondian, R. A., Insap Santosa, P., & Nugroho, E. (2019). Faktor - faktor yang mempengaruhi kesuksesan pembelajaran daring dalam revolusi industri 4.0. In *Seminar Nasional Teknologi Komputer & Sains (SAINTEKS) 2019*. <https://seminar-id.com/semnas-sainteks2019.html>
- Rahmanita, F. (2020). Analisis pengaruh teknologi informasi dan komunikasi pada kemandirian belajar siswa pada masa pandemi Covid-19. *Jurnal Pendidikan, Hukum, Dan Bisnis*, 5(1), 69–77.
<https://doi.org/http://dx.doi.org/10.32493/eduka.v5i1.8167>
- Ratnasari, E. D., Saputra, N., & Rahmana, F. (2021). The effect of online learning technology on learning effectiveness. In *Proceedings of 2021 International Conference on Information Management and Technology, ICIMTech 2021*, 702–705. <https://doi.org/10.1109/ICIMTech53080.2021.9535093>
- Sani, R. A. (2013). *Inovasi pelajaran*. Jakarta : Bumi Aksara.
- Sari, L. O. (2021). Pengaruh pembelajaran daring menggunakan media whatsapp di tengah wabah virus Covid-19 terhadap kemandirian belajar siswa sekolah dasar Negeri Jombor Ceper Klaten Tahun Pelajaran 2020/2021. SKRIPSI. Klaten: Universitas Widya Dharma Klaten
- Sudrajat, J. (2020). Kompetensi guru di masa pandemi Covid-19. *Jurnal Riset Ekonomi dan Bisnis*, 13(1), 100–110.
<https://doi.org/http://dx.doi.org/10.26623/jreb.v13i2.2434>
- Sun, A., & Chen, X. (2016). Online education and its effective practice: A research review. *Journal of Information Technology Education: Research*, 15, 157–190.
<https://doi.org/10.28945/3502>
- Sutisna, D., & Widodo, A. (2020). Peran kompetensi guru sekolah dasar dalam meningkatkan efektivitas pembelajaran daring. *Jurnal Bahana Manajemen Pendidikan*, 9(2), 58–64.
<https://doi.org/https://doi.org/10.24036/jbmp.v9i2.110927>
- Syah, M. (2008). *Psikologi pendidikan dengan pendekatan baru* (A. S. Wardani (ed.)). Bandung : PT. Remaja Rosdakarya.
- Usman, M. U. (2013). *Menjadi guru profesional*. Bandung : PT. Remaja Rosdakarya.
- Utari. (2013). Efektivitas Layanan information and communication technology (ict) dalam proses pembelajaran di SMK 2 Sewon. Skripsi. Yogyakarta: Universitas Negeri Yogyakarta
- Wang, C. H., Shannon, D. M., & Ross, M. E. (2013). Students' characteristics, self-regulated learning, technology self-efficacy, and course outcomes in online learning. *Distance Education*, 34(3), 302–323.
<https://doi.org/10.1080/01587919.2013.835779>

- Widayati, I., Hakim, L., & Wahjudi, E. (2020). Keefektifan penggunaan modul praktikum untuk mata kuliah Komputer Akuntansi. *Pekobis: Jurnal Pendidikan, Ekonomi dan Bisnis*, 5(2), 108–116. <https://doi.org/http://dx.doi.org/10.32493/pekobis.v5i2.P108-116.9879>
- Zhang, W., Wang, Y., Yang, L., & Wang, C. (2020). Suspending classes without stopping learning: China's education emergency management policy in the COVID-19 outbreak. *Journal of Risk and Financial Management*, 13(3), 55. <https://doi.org/10.3390/jrfm13030055>
- Zia, A. (2020). Exploring factors influencing online classes due to social distancing in COVID-19 pandemic: A business students perspective. *International Journal of Information and Learning Technology*, 37(4), 197–211. <https://doi.org/10.1108/IJILT-05-2020-0089>