







Cracking the code: Understanding lecturer performance and student success

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ARTICLE INFO

Article history

Received 2022-09-07

Revised 2022-11-08

Accepted 2022-12-01

Published 2022-12-25

Keywords

Lecturer performance

Online learning

Students' online learning

Online learning outcomes

ABSTRACT

One of the essential factors in a learning process, especially in higher education, is lecturer performance. This study aims to discover the impact of a lecturer's performance on students learning outcomes in the online learning environment. Lecturer performance is represented by four aspects which are the lecturer's performance on learning technology (X1), the lecturer's performance on learning pedagogy (X2), the lecturer's performance on supporting learners (X3), and the lecturer's performance on supporting educators (X4). This quantitative research approach aims to discover one variable's cause-and-effect relationship to another. The subject of this study is 37 lecturers and 146 students. The result shows that the lecturer's performance contributes 43.1% to students' learning outcomes. It is known that learning technology and pedagogy aspects have a significant effect on students' learning outcomes. However, supporting learners and educators does not significantly impact students' learning outcomes. Therefore, the lecturer's performance positively impacts learning outcomes and is valuable for further online learning development. A potential research contribution could be to investigate further the relationship between specific aspects of a lecturer's performance and students' learning outcomes in an online learning environment. this study's findings have significant implications for higher education institutions seeking to improve online learning experiences for students. By identifying the specific aspects of lecturer performance that most impact learning outcomes, institutions can provide targeted support and training to their lecturers, ultimately leading to improved learning outcomes for students in online learning environments.



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1. Introduction

According to UNESCO [1], approximately 290,500,000 students worldwide experienced learning activities disrupted due to the impact of the educational restrictions of the Covid-19 pandemic. This condition impacts all educational institutions, from primary to higher education [2]–[4]. Therefore, several countries in ASIA, Europe, Africa, and America have decided to restrict offline learning activities at schools and universities. Due to these conditions, UNESCO recommends and supports implementing inclusive online or distance learning solutions. To suppress the spread of COVID-19, students learn from their hometowns and come from various regions. However, some students need help participating in online learning due to network issues [5]. This is because of uneven network infrastructure, especially in rural areas. Moreover, it creates unpleasant experiences during online learning, such as late getting information and processing assignments. The use of information and

communication technology (ICT) is helpful in the learning process, especially in the online learning Field [6]–[8]. Furthermore, the success of online learning is influenced by the development of science and technology in society. Moreover, the online learning quality assurance framework shows that the quality of online learning can be reviewed from various aspects: (1) institutions; (2) learning design; (3) evaluation; (4) technology; (5) pedagogical factors; (6) support for learners; and (7) support for teachers [9]. Moreover, this study focused on lecturer or instructor performance as one of the online learning success indicators.

According to Sonnentag & Frese [10], performance is the person's success level during a specific period in performing learning tasks. Then, it will be compared to various work standards, targets, or criteria determined and mutually agreed upon. Moreover, performance is the quality and quantity of the task, whether done by individuals, groups, or institutions. Each person's performance is based on daily duties and responsibilities targeted to him. Furthermore, performance management aims to increase productivity and effectiveness and design each teacher's success [11], [12]. A person's personality in a school is shaped by the nature and environment in which they experience an extended period. Cultural personality differences are traced mainly to the influence of different environments in which people from different cultures have progressed over several generations. Performance review has several advantages: implementing a reward and punishment system, providing feedback for lecturers for career development, identifying development training needs for lecturers, and diagnosing problems within the institution.

Online learning and working from home for educators are changes that must be made to continue teaching activities. Apart from this pandemic, online learning aims to increase education quality, increase even access, expand education, and the relevance of the education Field [13], [14]. Several factors affect performance in online learning, such as expectations regarding rewards, internal drives, abilities, needs and traits, task perceptions, internal and external rewards, perceptions of rewards level, and job satisfaction Field [15], [16]. Moreover, good quality online learning following the needs of stakeholders is one of the expanding mechanisms for access to higher education. Based on the research background, the challenge of online learning is to create a whole environment suitable for the subject. A lecturer's performance is one factor that makes online learning suitable. Therefore, this study aims to review and evaluate a lecturer's performance in the online learning environment. This novel discovery represents the quality of online learning as the basis of future development to implement online education.

A potential research gap could be the lack of studies examining the relationship between the quality of network infrastructure and students' online learning experiences. While Previous research mentions that some students experience difficulties participating in online learning due to network issues, it does not explore the extent to which these network issues impact students' learning outcomes or overall satisfaction with online learning. This research suggests that the success of online learning is influenced by various factors such as institutions, learning design, technology, pedagogical factors, and support for learners and teachers. However, it does not specify which of these factors have the most significant impact on online learning success or how they interact with each other to create a successful online learning environment. Additionally, penelitian ini mentions that performance review has several advantages, such as implementing a reward and punishment system and providing feedback for career development, but does not explore the specific mechanisms through which performance review impacts lecturer performance or how it can be implemented effectively in an online learning environment.

2. Method

This quantitative research approach aims to discover one variable's cause-and-effect relationship to another. The main factor that was measured in this study is a lecturer's performance. There are several indicators to represent this factor which are; (1) pedagogy; (2) technology usage; (3) supporting learners; and (4) supporting educators. This study uses these four indicators to measure the lecturer's performance. Moreover, Fig 1 presents the theoretical framework of this study. This study uses a participatory survey method to collect data or information about a population using a representative sample. The research sample is 37 lecturers. Observations were done through zoom discussions to evaluate the lecturer's performance in the learning process. Then, 146 engineering students filled out the questionnaire related to the lecturer's performance. There are 36 students from civil engineering, 37 from mechanical engineering, 40 from electrical engineering, and 33 from

industrial engineering. Moreover, 37 lecturers comprise nine civil engineers, ten mechanical engineers, 12 electrical engineers, and 16 industrial engineers. Furthermore, after the data is collected, it is calculated using statistical analysis, which is regression analysis. It is a method to determine the causal relationship between variables with other variables [17].

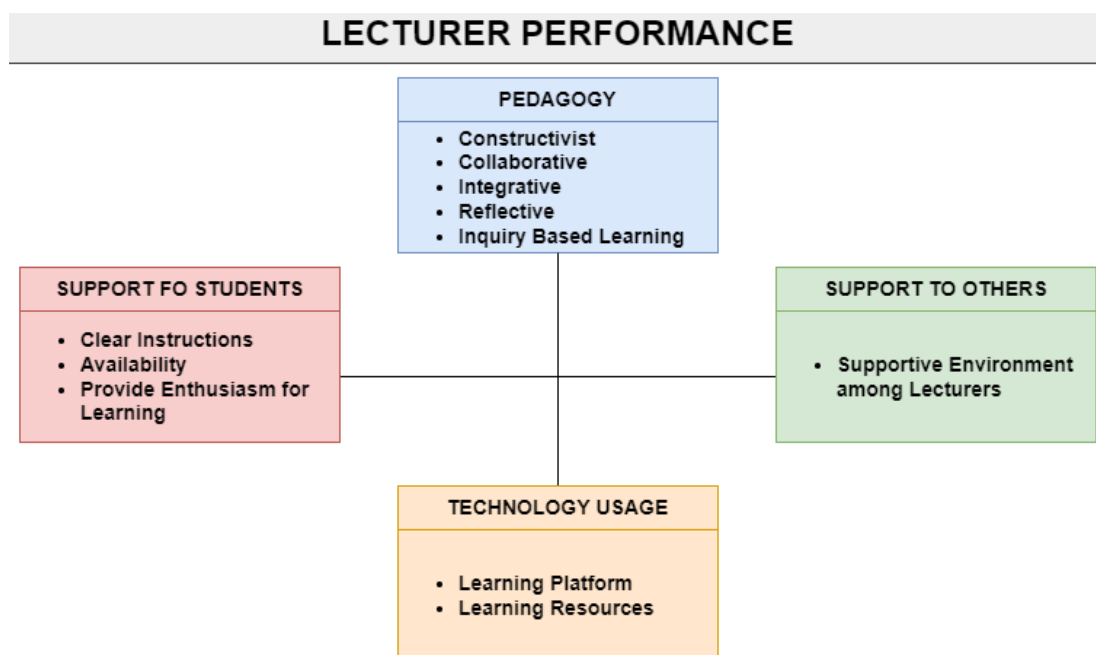


Fig. 1. Theoretical Framework

The relationship between these variables is functional and embodied in a mathematical model. In regression analysis, the variables are divided into two parts, dependent and independent variables. There are four dependent variables in this study which are the lecturer's performance on learning technology (X1), the lecturer's performance on learning pedagogy (X2), the lecturer's performance on supporting learners (X3), and the lecturer's performance on supporting educators (X4). These four variables will predict the independent variable, students' learning outcome (Y).

3. Results and Discussion

3.1. Statistical Result

Table 1 presents the ANOVA result. It shows the F value is 15.022 with a test significance is 0.000. This result means the independent variables (X1, X2, X3, and X4) can simultaneously predict students' learning outcomes. Moreover, Table 2 shows the model summary of the variables. The result shows that the dependent variable Y (learning outcomes) is influenced by all independent variables (X1, X2, X3, and X4) by around 43.1%.

Table 1. Anova Result

	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1062.193	4	265.548	15.022	.000 ^b
	Residual	4179.693	142	29.434		
	Total	5241.886	146			

a. Dependent Variable: abs

b. Predictors: (Constant), X1, X2, X3, X4

Based on Table 2, the value of R is 0.618, which means a multiple correlation coefficient that explains the independent variables (X1, X2, X3, and X4) conditions on learning outcomes (Y). In other words, the lecturers' performance can increase the variable of learning outcomes. Then, the value of the R square is 0.431, which is a multiple correlation coefficient that explains the impact of independent variables on the dependent variable. Moreover, the lecturers representing these four variables can increase the students' learning outcomes by 43.1%. In contrast, the remaining value of 56.1% is influenced by other factors that do not explore in this study. Furthermore, the Sig. F value is

0.01, smaller than 0.05. It means a significant correlation of independent variables (X1, X2, X3, and X4) simultaneously on students' learning outcomes (Y).

Table 2. Model Summary

Model	R	R Square	Adjusted R Square	Std. error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.618 ^a	.463	.431	3.71933	.040	1.482	4	142	.011	1.189

a. Predictors: (Constant), X1, X2, X3, X4

b. Dependent Variable: Y

Table 3 shows the coefficient result representing multiple linear regression equation models of students' learning outcomes. The result represents the significant effect level of each independent variable on a dependent variable. The value of a lecturer's performance on learning technology (X1) is 0.031 means there is a significant effect on students' learning outcomes. The value of the lecturer's performance on learning pedagogy (X2) is 0.034 means there is a significant effect on students' learning outcomes. The value of the lecturer's performance on supporting learners (X3) is 0.052 means there is no significant effect on students' learning outcomes. The value of the lecturer's performance on supporting educators (X4) is 0.057 means there is no significant effect on students' learning outcomes. However, simultaneously all the independent variables affect students' learning outcomes. The constant table value is 0.415, indicating that independent variables positively affect students' learning outcomes. It means that if the lecturer's performance increases, the student's learning outcomes will also increase.

Table 3. Coefficients Result

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.415	2.716		6.669	.611
	X1	.431	.031	.374	.187	.031
	X2	.347	.032	.415	1.839	.034
	X3	.553	.031	.453	.702	.052
	X4	.462	.033	.609	.119	.057

a. Dependent Variable: abs

3.2. Description Result

Lecturer's performance on learning technology (X1) affects students' learning outcomes. It means that the university's official learning management system supports lecturer performance in online learning technology. In its implementation, lecturers also used multiple online platforms such as zoom, google meet, classroom, and WhatsApp. Moreover, the system is equipped with turn editing on/off and add an activity or resource. The activities feature is equipped with: assignment, attendance, bigbluebuttonBN, chat, choice, and database. Also, the recourses have a menu of books, files, folders, LMS content packages, and URLs. All these features can be used freely by lecturers/instructors to facilitate the implementation of online learning. Technology infrastructure development and sustainability are essential, especially the resilience of learning platform technology [18]. The functionality of the technology platform, including swift interconnectivity between the various technologies, is also essential. In online learning implementation, the use of the online platform is essential. It can assist in several tasks, such as self-learning, task collection, and exam [19]. It is shown that the performance of the technology in the aspect of the equipment is very supportive. Several research results indicate that tools or devices play an essential role in online learning [20], [21]. However, this support is insufficient because some lecturers cannot operate the learning platforms. Also, the students are not familiar with the learning platforms. Therefore, the use of technology in online learning should be accompanied by user technology acceptance [22], [23]. The user, lecturer, and student must understand all the LMS environments, including features and user interface. This is to ensure that the use of technology in learning will run optimally and as expected. A good LMS should be adapted to user needs. It is what determines whether the learning features are valuable and useful. Learning features should be easy to use, so these features can make users feel comfortable and helpful to accomplish tasks or assignments [24], [25].

The other essential factors in online learning are accessibility and reusability. Accessibility is related to facilitating learner access to all available online learning resources. At the same time, reusability refers to using technology to produce and store various learning resources that can be

shared and reused (including modified) to improve learning outcomes. This is related to the results of previous research, which stated that access to technology plays a vital role in online learning [26], [27]. The following variable observed in this study is the lecturer's performance on learning pedagogy (X2). This variable significantly affects students' learning outcomes ($0.034 < 0.05$). It represents that the lecturer's pedagogical content knowledge (PCK) is good and positively influences decision-making related to learning strategies (pedagogics) changes. The concept of PCK includes; (1) knowledge and beliefs about the purpose of teaching; (2) students' understanding of knowledge, conceptions, and misunderstandings about specific topics; (3) knowledge of curriculum and curriculum materials; and (4) knowledge of instructional strategies and representations for teaching specific topics. The lecturer will positively impact the pedagogical aspect with a deep understanding of the content knowledge. In online learning, the effectiveness of learning depends on student activity or student-centered learning. This approach includes discussion, argumentation, and contextualizing material with experience. A student-centered pedagogy that allows learners to express opinions, make decisions, and reflect will support learners to be actively involved in the learning process. There is consideration to make online learning run optimally, which relates to learning readiness, including self-confidence in computer utilization, self-learning, student control, learning motivation, and self-confidence toward online communication. Teachers must realize that learning is very complex because it simultaneously involves pedagogical, psychological, and didactic aspects. Therefore, online learning is not just material transferred through internet media. It is not just assignments and social problems sent through social media applications. Moreover, online learning materials must also consider the constructivism theory that makes students play an active role.

In the pedagogical performance, the interaction of students with lecturers, other fellow students, and the learning environment is the core process that will create communication among learning elements. Therefore, a scenario to create interaction in online learning is the key to effective communication and interactivity. Related to the lecturer activity as facilitators, they can provide additional online knowledge, improving the learning quality. It is because the skills and expertise of lecturers in using new technologies can affect the quality of learning [28]. Furthermore, communication between students and lecturers positively correlates with learning outcomes, the more intensive the communication, the better the learning outcomes [29]. In an online learning environment, creating a physical sense of real class can be critical in increasing student participation. This can be done by designing a learning environment that focuses on social interactions, such as features for personal communication, discussion, motivation, individual engagement, and sharing learning materials. Learning resources have become an essential factor in online learning. Students must be provided with various learning resources to achieve optimal learning outcomes. These learning resources can be digital or non-digital, new or re-developed, or direct links to other learning resources.

For the assessment, as in conventional learning, the type and method of assessment in online learning also determine how learning activities should be designed. In addition, online assessments also need to pay attention to security, accessibility, identification, and plagiarism factors. One assessment method for online learning is performance assessment. This assessment form asks students to demonstrate specific tasks via an online conference platform to apply their knowledge and skills [30], [31]. Performance assessments can be performed when students complete performance tasks and focus on assessing processes and outcomes. The third variable is a lecturer's performance in supporting learners (X3). The analysis results indicate no effect on students' learning outcomes ($0.052 > 0.05$). This result assumes that students determine their criteria for learning completeness and understanding the material. In online learning, students are responsible for being independent and finding appropriate knowledge. It will encourage student independence and causes differences in different learning successes. In this case, students must have a high spirit of independent online learning [32]. It is related to previous research that states self-learning is a process in which students are directly involved in identifying what needs to be learned to be in control of the learning process. Moreover, students have different technical abilities, so technical assistance services must be available, especially regarding how to operate the learning technology platforms.

The last variable observed in this study is the lecturer's performance in supporting educators (X4). The analysis result indicates no effect on students' learning outcomes ($0.057 > 0.05$). In online learning, teachers are expected to teach using innovative ways and with innovative pedagogy. Therefore, it needs support from experts who have mastered the pedagogical aspect. The success of the lecture development model in online learning requires creating a systematic learning culture and a unified language for learning new knowledge and practical skills [6], [33]. Based on the result

description, technology has become an essential tool for online learning. All available features can facilitate online learning to run optimally. However, as a learning executor, the lecturer must understand all the environments, from the user interface to all available features. Then, this factor will determine the pedagogical factor in online learning. In its implementation, the scenario that facilitates online learning has not been appropriately designed. Learning resources have not been used properly due to various obstacles, including unfamiliarity. Therefore, the pedagogical design must be adapted to the needs of online learning. Technical support for students related to technology utilization is necessary because students' skills and technical abilities are still limited. Here, the lecturer should become a facilitator who can provide helpful information or tutorial for students. In addition, a supportive environment between lecturers should be improved. It aims to create a supportive environment among lecturers and share compelling learning scenarios.

4. Conclusion

Based on the study result, it is known that lecturers' performance positively impacts students' learning outcomes. The lecturer's performance contributes 43.1% to students' learning outcomes, while 56.1% is influenced by other factors that this study does not explore. The lecturer's performance on learning technology and pedagogy has a significant effect on students learning outcomes. However, these aspects can still be improved to provide better technology use and an ideal online learning scenario appropriate for students' needs. Moreover, there is no significant aspect to student learning outcomes in supporting learners and educators. It is because of the high level of self-learning in the online learning implementation. Thus, the lecturer only gave general instructions and did not provide too much material. However, paying attention to students unfamiliar with online learning is still necessary, so they still need to be supervised in their implementation. In addition, a supportive environment among lecturers needs to be improved to share ideas regarding ideal pedagogical aspects and bring a positive impact on online learning. For further study, it is necessary to consider the online learning environment. For example, in the LMS, technology acceptance should be studied to discover user perception as a consideration for its development. Also, innovation related to online pedagogical learning should continuously be developed to create exciting and effective online learning.

Acknowledgment

The authors would like to thank Universitas Negeri Malang and the American University of Sharjah, for facilitating and sharing resources of the research collaboration.

Declarations

- Author contribution** : All authors have equal contributions to the paper.
Funding statement : The research is funded under Universitas Negeri Malang.
Conflict of interest : The authors declare no conflict of interest.
Additional information : No additional information is available for this paper.

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