



# The Effectiveness of the Use of E-learning (SISFO) on Improving Lecturer Performance and Academic Learning at PGRI Palembang University

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**Abstract.** Utilization in learning with a hybrid concept certainly cannot be separated from the use of e-learning, especially during the Covid-19 pandemic that began in 2020. E-Learning is a must-have for a university in adapting the learning carried out by lecturers to students. Students and other academic processes such as teaching, assigning assignments and filling in student score data. This study aims to see the effectiveness of the use of E-Learning (SISFO) to improve the performance and academic learning of a lecturer. The research was conducted in 2022 using a mixed method (Qualitative and Quantitative). The research sample was taken using random sampling technique and obtained as many as 26 Lecturers of the University of PGRI Palembang. Data was collected by means of questionnaires, literature studies, and interviews. The data that has been collected is then analyzed descriptive quantitative. The results showed that the average score of the lecturer performance indicators was in the very high category, namely 4.4 with a percentage of 88%. While in the academic learning of lecturers, the average score of academic learning indicators is 4.36 with a percentage of 87.23 in the very high category. SISFO PGRI University Palembang also has 16 features of learning activities and 7 features of learning resources that facilitate lecturers in implementing e-learning. These results indicate that the use of E-learning SISFO used at PGRI Palembang University supports lecturer performance and academic learning takes place effectively.

**Keywords:** E-Learning · Lecturer Performance · Academic Learning

## 1 Introduction

The development of technology and information in the era of the industrial revolution 4.0 which is currently growing so fast and certainly affects the characteristics of current jobs in 2022 and even in the future, where skills and competencies are the main things that need attention. Because in the era of the industrial revolution 4.0, the integration of the use of technology and the internet which is so sophisticated and massive, also greatly influences changes in the behavior of the business world and the industrial world,

the behavior of society and consumers in general. Globalization flows and today's technology and information growth have a significant effect on various sectors [1]. One of that is educational sector. Ho et al. stated that the development of information and communication technology has brought an atmosphere and learning methodology to online learning, mixed learning, teleconferencing, and web-based learning [2].

The characteristics of education in the industrial revolution era include digitalization, computer proliferation, automation, application of artificial intelligence, interaction between humans and machines, automatic data exchange and communication, and the use of information technology [3]. Therefore, the world of education must be able to develop an educational transformation strategy by considering the human resource sector that has competence in their field. According to the Minister of Research, Technology and Higher Education (Menristekdikti) Mohammad Nasir said that the challenges of the industrial revolution 4.0 must be responded to quickly and accurately by all stakeholders within the Ministry of Research, Technology and Higher Education in order to be able to increase the competitiveness of the Indonesian nation in the midst of competition. For this reason, Higher Education is required to formulate strategic policies in various aspects ranging from institutions, fields of study, curriculum, resources, as well as cyber university development, and research and development to innovation [4].

The Minister of Research, Technology and Higher Education (quoted by Mukhlisin, [5]) explained that there are five important elements that need to be considered in efforts to improve the economy and competitiveness of a nation in the era of the industrial revolution 4.0, namely: (1) universities must prepare more innovative learning systems that can support development students' abilities in the fields of integrating physical, digital, and human objects, Operational Technology (OT), Big Data Analytics, Information Technology (IT), and the Internet of Things (IoT) so that they can produce graduates who are competitive and have important 21st Century skills, especially in the fields of data literacy, technology literacy and communication; (2) Higher education carries out policy reconstruction at its institutions to be more responsive and adaptive to the development of the industrial revolution 4.0. In addition, it has begun to seek the implementation of the Cyber University program, for example, the distance lecture system, and hybrid learning to reduce the intensity of lecturer and student meetings. Cyber University which is then expected to be a solution for the nation's children in remote areas to be able to take higher quality higher education; (3) Preparing human resources for educators such as lecturers and researchers who are reliable, adaptive, and responsive in responding to the industrial revolution 4.0. As well as maintaining the quality and quantity of facilities, infrastructure, education and research infrastructure in higher education institutions so that the quality of education, research and innovation is always in optimal condition; (4) Make new breakthroughs in research and development that can support the revolution of industry 4.0 and create a good research and development atmosphere to support optimizing the development of research and development quality in Universities, Research and Development Institutions, Industry, LPNK, and the community; and (5) Making new breakthroughs in the form of innovation and increasing the productivity of technology-based institutions. Universities must be able to meet the demands of the community's needs in aspects of education and technological development so that digital media and information technology can be used optimally. Especially during the

Covid-19 pandemic, which has become a phenomenon of acceleration of universities to immediately optimize the implementation of all their activities to be based on the industrial revolution 4.0.

There are 4 driving factors for digital transformation [6]. These factors are regulatory changes, changes in the competitive landscape, shifts/changes to the digital form of the industry, and changes in consumer behavior and expectations. Information technology and digital media in digital transformation in society have provided various benefits, such as increasing convenience in an activity, reducing dependence and constraints related to location, increasing the availability of information, enabling remote instant communication, speeding up processing time for an activity.

The benefits above only have value if they are brought in one direction. When it comes to digital transformation for universities, the direction needed is today's higher education goals. If this is clear, then information technology is included in the educational paradigm. Without clear and correct directions, the use of technology will not be optimal. Conflicts with existing academic or administrative systems or procedures are inevitable. The result is that the potential of technology cannot be released as expected. Users, in this case the academic community of universities, become antipathy to the technological innovations that are applied. They will prefer conventional methods because technology is considered unable to meet their needs. For example, universities create e-learning websites for students and the content has been provided according to the curriculum. If the lecturer is not guided by the material in the e-learning and continues to provide assignments, teaching materials, or exams only from reference books that he has used for a long time, then students do not feel the need to access e-learning.

PGRI Palembang University is one of the universities in South Sumatra that has responded to the acceleration of digital transformation. The acceleration is carried out not only in the field of learning, but also in the management of the archives used [7]. In learning activities, digital transformation is carried out through the use of E-Learning in the learning process. The e-learning is called SISFO PGRI Palembang University has facilitated Lecturers to carry out online learning using SISFO with the aim that lecturer performance can be increased and the learning carried out takes place effectively. Lecturer performance is the quality of the work carried out by teaching lecturers that have been carried out [8]. Lecturer performance is one of the determinants of the success of learning that takes place in a university [9]. Therefore, it is important for a university to review the performance of lecturers on a regular basis. Academic learning is one of the supporters of the creation of good lecturer performance. Academic learning in this research is a learning process that does not only focus on the acquisition of student outcomes but more on how understanding, cognitive, affective, and psychomotoric changes occur in students which are then able to be applied in their daily lives [10]. Previous research still has limitations, namely only explaining the features contained in e-learning and not measuring how effective the use of the learning is after it is used.

Based on this background, the researcher considers it important to measure the effectiveness of the use of E-learning SISFO used at PGRI Palembang University, so this article draws the title The effectiveness of the use of E-learning (SISFO) on improving Lecturer Performance and Academic Learning at PGRI Palembang University.

## 2 Problem Statement

Along with the development of globalization and the industrial revolution 4.0, all universities experienced obstacles in the process of implementing education administration which was accompanied by the development of the digital era, so that the use of information technology was seen only as a trend. For example, sometimes universities only build websites or only provide free Wi-Fi for students without providing special content relevant to learning. The procurement of information technology facilities and infrastructure is not just a prestige or a minimum standard that must exist without considering its purpose. Ideally, universities really understand the problems of education today and present information technology as a solution so that they can carry out digital transformation. Digital transformation in the scope of higher education does not only mean building digital infrastructure. But more than that, digital transformation is the construction of facilities and a change of mindset aimed at meeting the growing needs of students and other academics in building a connected learning environment. It can be implemented by combining technology, services and security systems, which can create a collaborative, interactive and impersonal learning experience. Digital transformation, as mentioned a little at the beginning of this article, can be interpreted as a process of utilizing existing digital technologies such as virtualization technology, mobile computing, cloud computing, integration of all existing systems in the organization and so on [10]. Therefore, this study intends to explain the problem of the role and effectiveness of implementing educational administration in higher education in the current digital era, in this case the effectiveness of using E-learning SISFO on lecturer performance and ongoing learning.

## 3 Methodology

This study uses research that combines quantitative and qualitative approaches (mixed method) [12]. Quantitative approach is used to measure the data on the effectiveness of the role of E-learning SISFO at PGRI Palembang University. While the qualitative approach is used to analyze the data on the effectiveness of the role of education administration. That is, qualitative functions as a method to support the external validity of quantitative data.

The sample of this research were 26 lecturers of PGRI Palembang University who came from various backgrounds and the sample was taken using random sampling technique. The simple random sampling technique is a simple technique because the sampling of members from the population is carried out randomly without seeing and paying attention to the similarities or strata that exist in the population [13].

Methods of data collection was done by using a questionnaire, observation, literature study and interviews. Questionnaires were used to obtain data on lecturer performance and effective learning carried out by lecturers when carrying out learning using E-learning SISFO. The questionnaire given consists of 30 statements, with a distribution of 15 statements regarding lecturer performance and 15 statements regarding effective learning. There are five lecturer performance indicators used in this study, namely ability, initiative, timing, quality of work, and communication [8]. While the effective learning indicators used are the management of learning implementation, communicative processes, student responses, learning activities, and learning outcomes [10].

The research instrument with this questionnaire method was compiled based on the indicators that have been described previously so that each statement that will be submitted to each respondent is clearer and can be structured [13]. The data obtained are qualitative in nature and will be converted into a quantitative form with a statistical analysis approach. In general, the scoring technique used in this research questionnaire is the Likert Scale technique.

The use of quantitative descriptive analysis method in this research causes the data obtained to be processed in a quantitative and qualitative way. Quantitative data analysis technique is by distributing questionnaires using a Likert scale [13] with 5 categories, namely: (1) Score 5 for the answer category strongly agree; (2) Score 4 for the answer category agrees; (3) Score 3 for the category of answers quite agree; (4) Score 2 for the category of disagree answers; and (5) Score 1 for the answer category strongly disagree.

While qualitative data obtained from observations, literature studies and interviews and processed into words, sentences, schemes or pictures. The data obtained were then analyzed in several stages, namely data reduction, data display, conclusion: decision making and verification. While the data validity test in qualitative research is carried out by using the credibility test, transferability test, dependability test, and confirmability test. The qualitative analysis technique is carried out by analyzing the results of observations, quantitative data with the aim of showing or explaining the effectiveness of E-learning SISFO on the performance of lecturers and learning at one of the universities in Palembang City, Indonesia (PGRI Palembang University).

## 4 Results and Discussion

Credibility testing is done by data triangulation, namely source triangulation, technical triangulation, and time triangulation. Source of triangulation is carried out to the faculty quality assurance group, and the students being taught. Technical triangulation was carried out using observation, interviews, literature studies, and questionnaires. Meanwhile, time triangulation was carried out at different times when the data was collected. Based on the data triangulation that has been done, it can be concluded that the data has been tested for credibility.

The descriptive analysis in this study provides an overview of the data related to the mean, standard deviation, and variance. The analysis of the questionnaire is divided into 2, namely on the performance of lecturers and on effective learning. The results of the questionnaire obtained were then analyzed quantitatively based on the percentage categories in Table 1.

The lecturer performance questionnaire consists of 15 statements that include 5 indicators, namely ability, initiative, timing, quality of work, and communication [8]. Ability indicators related to mastery of material, mastery of teaching methods, mastery of lecturer's E-learning SISFO. Initiative indicators are indicators related to better positive thinking, achieving achievements, and realizing creativity. Timing indicators related to the start and end time of learning. Indicators of the quality of work are indicators related to student satisfaction, student achievement, and student understanding. And communication is an indicator related to the quality of material delivery and mastery of the learning atmosphere. The data analysis of the lecturer's performance questionnaire is described in Table 2 and Fig. 1.

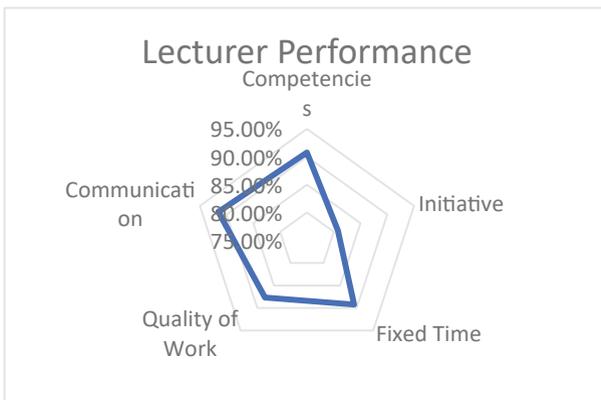
**Table 1.** Category Percentage of Effectiveness

No	Score Range	Category Percentage
1	$83.35 < x \leq 100$	Very High
2	$66.68 < x \leq 83.35$	High
3	$50.01 < x \leq 66.68$	Moderate
4	$33.34 < x \leq 50.01$	Low Enough
5	$16.67 < x \leq 33.34$	Low
6	$0 < x \leq 16.67$	Very Low

(Source: Yazid, et al. [14])

**Table 2.** Descriptive Analysis of Lecturer Performance

No	Indicator of Lecturer Performance	Mean		Category Percentage	SD	V
		Score	%			
1	Competencies	4,54	90,77%	Very High	0,58	0,33
2	Initiative	4,04	80,77%	High	0,66	0,44
3	Fixed Time	4,46	89,23%	Very High	0,58	0,34
4	Quality of Work	4,38	87,69%	Very High	0,64	0,41
5	Communication	4,58	91,54%	Very High	0,58	0,33
Mean		4,40	88,00%	Very High	0,60	0,40



**Fig. 1.** Percentage Indicator of Lecturer Performance

Based on Table 2, it is known that there are four indicators of lecturer performance that are in the very high category, namely indicators of competencies, fixed time, quality of work, and communication with an average of 4.54, 4.46, 4.36, and 4.58 respectively.

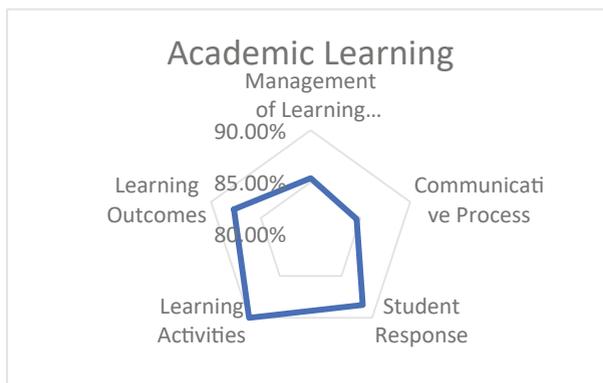
Meanwhile, there is one indicator that is in the high category, namely the initiative indicator with an average score of 4.04. And the average of all indicators is 4.4 or 88% in the very high category. Furthermore, based on Fig. 1, it is explained that the highest category percentage gain is found in the communication indicator, and the lowest is in the initiative indicator.

Furthermore, the lecturer's learning questionnaire consists of 15 statements that include 5 indicators, namely the management of learning implementation, communicative processes, student responses, learning activities, and learning outcomes [10]. The results of the learning questionnaire data analysis are described in Table 3 and Fig. 2.

Based on Table 3, it is known that each learning indicator is in the very high category, with an average of 4.27, 4.23, 4.42, 4.50 and 4.38 respectively. And the average of all indicators is 4.36 or 87.23% in the very high category. Furthermore, based on Fig. 2, it is explained that the highest category percentage gain is found in the learning activities indicator, and the lowest is in the communicative process indicator.

**Table 3.** Descriptive Analysis of Academic Learning

No	Indicator of Academic Learning	Mean		Category Percentage	SD	V
		Score	%			
1	Management of Learning Implementation	4,27	85,38%	Very High	0,83	0,68
2	Communicative Process	4,23	84,62%	Very High	0,71	0,50
3	Student Response	4,42	88,46%	Very High	0,64	0,41
4	Learning Activities	4,50	90,00%	Very High	0,58	0,34
5	Learning Outcomes	4,38	87,69%	Very High	0,50	0,25
Mean		4,36	87,23%	Very High	0,65	0,44



**Fig. 2.** Percentage Indicator of Academic Learning

Education that uses information technology will accelerate the process of implementing e-learning. Online learning using SIKITO at PGRI Palembang University gave positive results on the performance of lecturers and the learning carried out. This is in accordance with the statement of Siagian et al. that learning with e-learning design will change learning activities in conventional classrooms using whiteboards into a web-based online environment [15]. This can support two-way communication and interaction between students and lecturers. The same thing was stated that the use of e-learning in universities is an innovation that can provide opportunities for lecturers to increase competence in designing digital learning and implementing learning according to the characteristics of students so that it can be more easily understood [16, 17].

SISFO is an online portal that facilitates various academic interests at the University of PGRI Palembang. SISFO in this study is focused on its function as an e-learning learning portal conducted by lecturers and students. As a lecturer, SISFO can be used to access information regarding teaching schedules, tutoring schedules, entry of student grades and online learning activities or e-learning. The following Fig. 3 and Fig. 4 are the display of SISFO e-learning at PGRI Palembang University when logged in as a lecturer.



Fig. 3. SISFO PGRI Palembang University login page

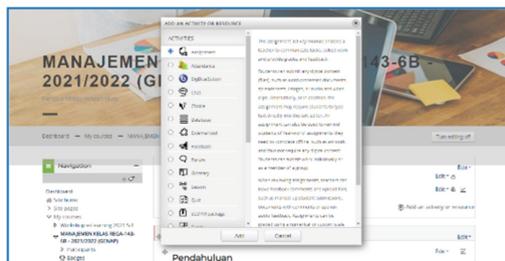


Fig. 4. Activities and Resources in E-Learning SISFO (Source: PGRI Palembang University)

E-learning SISFO PGRI Palembang University has 16 activity features and 7 learning resource features. There are sixteen features of learning activities that can be used by lecturers in e-learning, including:

1. **Assignment.** The assignment activity module enables a teacher to communicate tasks, collect work and provide grades and feedback. Students can submit any digital content (files), such as word-processed documents, spreadsheets, images, or audio and video clips. When reviewing assignments, teachers can leave feedback comments and upload files. Final grades are recorded in the gradebook.
2. **Attendance.** The attendance activity module enables a teacher to take attendance during class and students to view their own attendance record. Reports are available for the entire class or individual students.
3. **Bigbluebutton.** BigBlueButton lets you create from within Moodle links to real-time on-line classrooms using BigBlueButton, an open-source web conferencing system for distance education.
4. **Chat.** The chat activity module enables participants to have text-based, real-time synchronous discussions. Chats are especially useful when the group chatting is not able to meet face-to-face
5. **Choose.** The choice activity module enables a teacher to ask a single question and offer a selection of possible responses. Results may be published with student names or anonymously.
6. **Database.** The database activity module enables participants to create, maintain and search a collection of entries (i.e. records). The structure of the entries is defined by the teacher as a number of fields.
7. **External tool.** The external tool activity module enables students to interact with learning resources and activities on other web sites. A teacher can create an external tool activity or make use of a tool configured by the site administrator.
8. **Feedback.** The feedback activity module enables a teacher to create a custom survey for collecting feedback from participants using a variety of question types including multiple choice, yes/no or text input. Feedback responses may be anonymous if desired, and results may be shown to all participants or restricted to teachers only. Any feedback activities on the site front page may also be completed by non-logged-in users.
9. **Forum.** The forum activity module enables participants to have asynchronous discussions i.e. discussions that take place over an extended period of time. There are several forum types to choose from. A teacher can allow files to be attached to forum posts. Attached images are displayed in the forum post.
10. **Glossary.** The glossary activity module enables participants to create and maintain a list of definitions, like a dictionary, or to collect and organise resources or information. A teacher can allow files to be attached to glossary entries.
11. **Lesson.** The lesson activity module enables a teacher to deliver content and/or practice activities in interesting and flexible ways. A teacher can use the lesson to create a linear set of content pages or instructional activities that offer a variety of paths or options for the learner. A lesson may be graded, with the grade recorded in the gradebook.
12. **Quiz.** The quiz activity enables a teacher to create quizzes comprising questions of various types, including multiple choice, matching, short-answer and numerical.

The teacher can choose when and if hints, feedback and correct answers are shown to students.

13. Scorm package. A SCORM package is a collection of files which are packaged according to an agreed standard for learning objects. The SCORM activity module enables SCORM or AICC packages to be uploaded as a zip file and added to a course.
14. Survey. The survey activity module provides a number of verified survey instruments that have been found useful in assessing and stimulating learning in online environments. A teacher can use these to gather data from their students that will help them learn about their class and reflect on their own teaching.
15. Wiki. The wiki activity module enables participants to add and edit a collection of web pages. A wiki can be collaborative, with everyone being able to edit it, or individual, where everyone has their own wiki which only they can edit.
16. Workshop. The workshop activity module enables the collection, review and peer assessment of students' work. Students can submit any digital content (files). Submissions are assessed using a multi-criteria assessment form defined by the teacher.

Furthermore, there are seven features of learning resources that can be used by lecturers to enrich student learning resources in e-learning, including:

1. Book. The book module enables a teacher to create a multi-page resource in a book-like format, with chapters and subchapters. Books can contain media files as well as text and are useful for displaying lengthy passages of information which can be broken down into sections.
2. File. The file module enables a teacher to provide a file as a course resource. A file may be used to share presentations given in class, to include a mini website as a course resource, and to provide draft files of certain software programs (eg Photoshop.psd) so students can edit and submit them for assessment.
3. Folder. The folder module enables a teacher to display a number of related files inside a single folder, reducing scrolling on the course page. A zipped folder may be uploaded and unzipped for display, or an empty folder created and files uploaded into it.
4. IMS content package. An IMS content package is a collection of files which are packaged according to an agreed standard so they can be reused in different systems.
5. Label. The label module enables text and multimedia to be inserted into the course page in between links to other resources and activities. Labels are very versatile and can help to improve the appearance of a course if used thoughtfully.
6. Page. The page module enables a teacher to create a web page resource using the text editor. A page can display text, images, sound, video, web links and embedded code, such as Google maps.
7. URL. The URL module enables a teacher to provide a web link as a course resource. Anything that is freely available online, such as documents or images, can be linked to; the URL doesn't have to be the home page of a website.

Furthermore, researchers conducted interviews with lecturers to find out the obstacles encountered during online learning using E-learning SISFO, as well as suggestions for

improvements for the future. Based on the results of the interview, it was found that in the use of E-learning SISFO there were several obstacles found. These obstacles come from the intrinsic and extrinsic elements of lecturers, namely server optimization so that when E-learning SISFO is accessed by lecturers and students during peak hours or active learning hours, the network provides a fast response. Furthermore, suggestions were obtained from several lecturers, namely to add a student satisfaction questionnaire feature to the E-learning SISFO integrated PDDIKTI, as well as to design a virtual laboratory that allows lecturers to carry out pilot practice of virtual experimental activities in E-learning SISFO.

## 5 Conclusion

The results showed that the average score of the lecturer performance indicators was in the very high category, namely 4.4 with a percentage of 88%. While in the academic learning of lecturers, the average score of academic learning indicators is 4.36 with a percentage of 87.23 in the very high category. E-learning SISFO PGRI University Palembang has 16 features of learning activities and 7 features of learning resources. The learning activity features include assignment, attendance, Bigbluebutton, chat, choice, database, external tool, feedback, forum, glossary, lesson, quiz, score package, survey, wiki, and workshop. While the available learning resource features are book, file, folder, ims content package, label, page, and url. The results of this study indicate that the use of SISFO e-learning used at PGRI Palembang University supports lecturer performance and academic learning takes place effectively. In addition, there are several suggestions for development, namely to add a student satisfaction questionnaire feature to the SISFO e-learning integrated PDDIKTI, as well as to design a virtual laboratory that allows lecturers to carry out pilot practice of virtual experimental activities in SISFO e-learning.

**Authors' Contributions.** This study contributes to the existing literature by effectively using E-Learning (SISFO) in an effort to improve the performance of teaching staff (lecturers) and their academic learning abilities. so that higher education needs to make changes and developments in the digital era by making digital learning through E-Learning of each college.

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