Analysis of student responses toward activities using e-learning in higher education

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Abstract: The aim of this study is to investigate how students respond to learning activities using e-learning. Researchers analyzed students' responses based on four aspects of activity, including attendance discipline, assignment collection accuracy, enthusiastic use of e-learning teaching materials, and participation in group discussions. The research method used in this study is a quantitative descriptive method and usability testing method. The data analysis technique used is descriptive percentage. The sample for this study consisted of 100 students from the informatics education study program, including the batches of 2019, 2020, and 2021. The results showed that the average response rate of students towards e-learning activities was 67.19% for the year 2019, 81.32% for the year 2020, and 78.59% for the year 2021. Based on the findings, it can be concluded that students from all three batches responded positively to the e-learning activities.

Keywords*:* E-learning; Higher education; Computer network; PGRI

1. Introduction

Education is an essential component of individual growth, providing a learning experience that takes place in all environments and throughout life (Cherry, 1953). It has two fundamental goals: to help people become intelligent and knowledgeable, and to help them become good human beings (Nurhadi & Harahap, 2021). With the inclusion of various influences in the world of education, media and technology have developed in various types and formats, each with their own unique characteristics and abilities (Coman et al., 2020). One such form of information technology development applied in the world of education is online learning or e-learning (Jaya Saragih et al., 2020). E-learning is an attempt to transform the learning process in schools or colleges into a digital form bridged by internet technology (Rini et al., 2021). It is designed for a distance learning process, enabling learning between students and lecturers in different cities or locations (Mukarromah & Wijayanti, 2021). E-learning brings changes in the learning process, shifting the focus from teacher-centered to student-centered learning (Matsuyama et al., 2019; Schreurs & Dumbraveanu, 2014).

The use of e-learning has the potential to increase interactivity and efficiency in learning by facilitating communication between students and lecturers, as well as providing access to a wider range of learning materials (El-Sabagh, 2021; Rawashdeh et al., 2021). E-learning can be used not only for assignments but also for delivering teaching materials and descriptions of learning processes (Almaiah & Abdul Jalil, 2014). E-learning has been integrated into the learning process at Universitas PGRI Sumatera Barat, particularly in the informatics education study program and other study programs. The implementation of e-learning at Universitas PGRI Sumatera Barat began in 2017 with a blended learning model. In the informatics education study program, e-learning has been actively used since 2020 to date.

The e-learning platform at Universitas PGRI Sumatera Barat is an online learning medium utilized by the university's students. It is used for attendance-taking during lectures, module distribution by lecturers, discussion forums, submission of assignments, and conducting mid-semester and final exams (Novializa et al., 2022).

Lecturers in the Informatics Education study program, especially those who have participated in the e-learning competent lecturer development courses and Basic Computer Networks, have utilized all the features and resources available in e-learning. Learning through e-learning has had a positive impact on students, such as increasing their participation and engagement in learning. Based on the two features of activity and resource in e-learning, four features are most frequently used by lecturers and students in order to provide convenience and deepen the students' understanding of college material, namely attendance (absence), assignment (assignments), book (teaching materials), and forum chat (discussion). However, it was observed that the fourth feature, namely forum chat, is still not optimally utilized by the students. Therefore, it is necessary to analyze how the students respond to the use of activity and resource features in e-learning, so that all features can be used to their maximum potential.

2. Methods

2.1 Method of collecting data

The data collection method used in this research is descriptive with a quantitative approach. Quantitative descriptive is a type of research that is used to analyze data by describing or describing the data that has been collected (Nassaji, 2015). The research was conducted by giving questionnaires to students at Universitas PGRI Sumatera Barat as a research sample to find out their responses to the use of e-learning. The sampling method used in this study was stratified proportional random sampling (Shi, 2015).

Stratified proportional random sampling is a method of selecting a sample from a population by dividing it into homogeneous groups called strata. Random samples are then taken from each stratum, and the resulting estimates represent the entire population (Freeman, 1960) . The following sampling technique is calculated using the formula 1.

$$n = \frac{N}{1 + Ne^2}$$ (1)

The sample size (n), population size (N), and critical value/accuracy limit used (Ne) were considered in determining the sample size. The sample size for each group was calculated using the formula 2:

$$n_i = \frac{N1}{N} \: x \: n$$ (2)

Table 1. Sample

No	Force	Number of Students	Sample
1	2019	115	34
2	2020	112	33
3	2021	112	33
Amount		**339**	**100**

2.2 Evaluation method

The evaluation method used is the usability testing method, which is a method to assess the ease of use and user experience of a technology, application, or website (Maslov et al., 2021). The researcher used a questionnaire to evaluate usability, which contained statements related to aspects such as (1) student activities related to filling in absenteeism, (2) student activities related to accurately submitting assignments, (3) student activities related to enthusiastically using teaching materials in e-learning, and (4) student activities related to group discussions. The questionnaire was of a closed type with a Likert scale, using alternative answers such as strongly agree (SA), agree (A), disagree (D), strongly disagree (SD), and neutral (N). (Christensen, 2001). Positive statements should be given a score of 5, 4, 3, 2, and 1 respectively, while negative statements should be given a score of 1, 2, 3, 4, and 5. (Ross, 2010). The research questionnaire indicator is shown in Table 2.

Table 2. Indicator of student response instruments to the use of E-learning at Universitas PGRI Sumatera Barat

Indicator	Statement items	Number of items
Lecture Activities	1,2,3,4,5,6,7,8,9	9
Activities Group Discussion Activities	10,11,12,13	4
Activities in the Use of Teaching Materials and Materials	14,15,16,17	4
fluency of students in carrying out their duties	18,19,20,21,22	5
Amount		**22**

3. Results and discussion

Previous research has shown that students' responses to the use of e-learning in lectures can be seen from three aspects: enthusiasm, interaction, and practicality. In terms of enthusiasm, 78% of students had received socialization about e-learning, 82% were interested in using e-learning, and 81% did not feel bored during lectures. In terms of interaction, 69% of students stated that they could easily discuss with each other and receive feedback, and teaching materials could be printed, leading to a satisfaction rate of 95%. In terms of practicality, 97% of students stated that they supported lectures, 96% assessed that assignments and exams were easily accessible, and 93% of students reported that they could access e-learning at any time.

3.1 Description of research data

In this study, the researchers selected active students in the Informatics Education Study Program at the Universitas PGRI Sumatera Barat, for the 2022/2023 academic year as research participants. The researchers distributed research instruments in the form of a questionnaire containing 22 statements about Student Responses to Activity in Using E-Learning. Respondents were grouped based on their enrollment year, including the class of 2019, 2020, and 2021, who had used e-learning in the lecture process through a single access. Figure 1 presents the frequency distribution of the results of the number of statements for each indicator for students in the 2019 class.
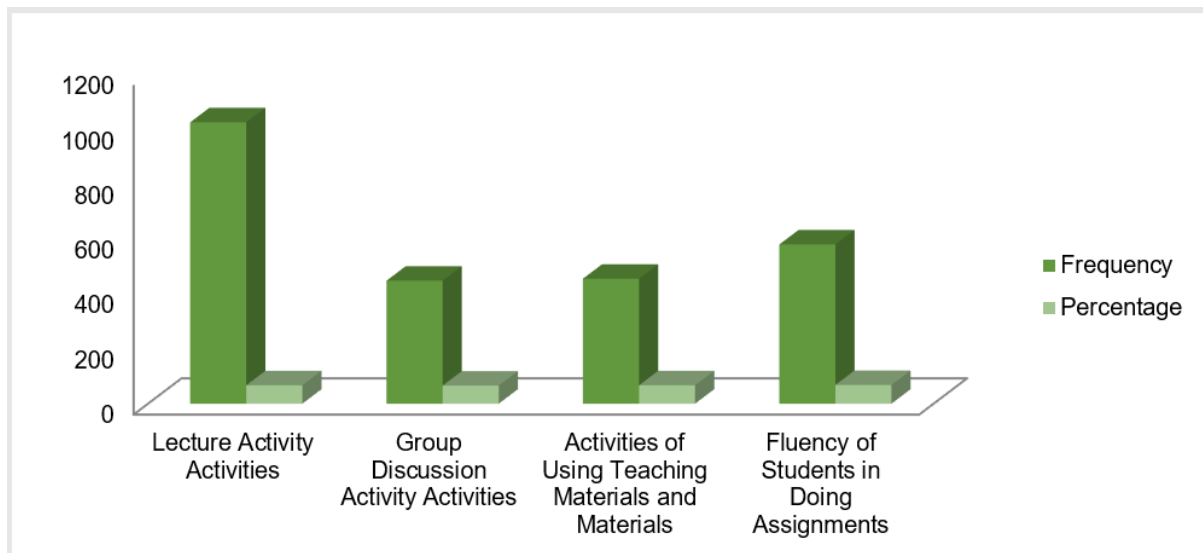
Figure 1. Frequency distribution of respondents class of 2019

Based on the data obtained from the respondents, it can be concluded that the Class of 2019 had several frequencies of 1027 respondents with a percentage of 67.12% for class activities, while group discussion activities had several frequencies of 449 respondents with a percentage of 66.02%. The use of teaching materials and materials for the Class of 2019 had a frequency of 456 with a percentage of 67.05%, and the smoothness of students carrying out assignments had a total frequency of 581 with a percentage of 68.35%. Therefore, the overall response rate for Class of 2019 students for activities using E-Learning as a whole was 2531 with a percentage of 67.19%, which falls under the good category with a range of 61% to 80%.
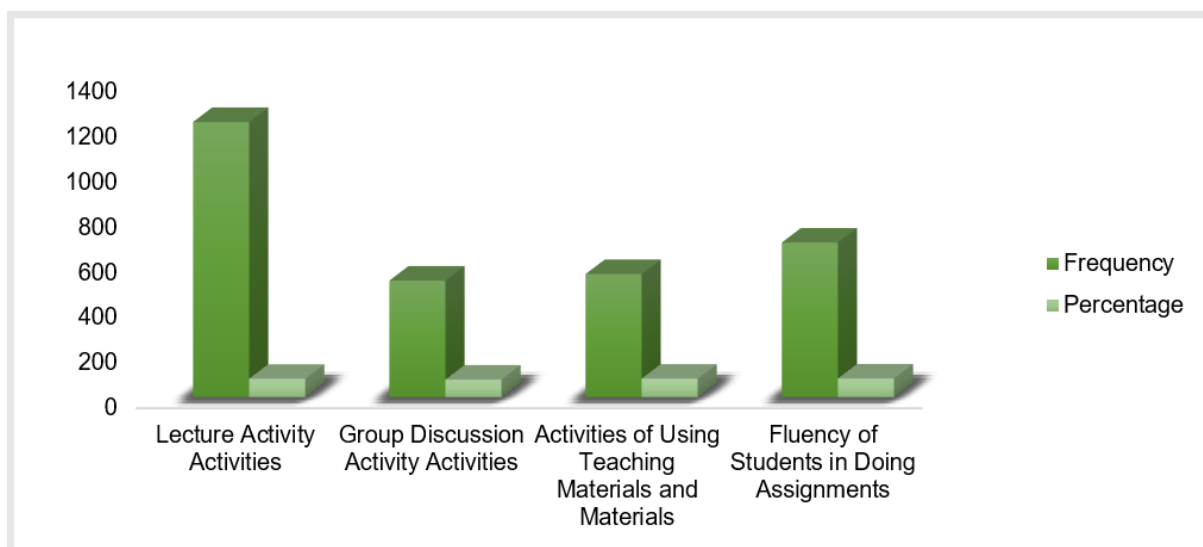

Figure 2. Frequency distribution of class of 2020

Figure 2 presents the frequency distribution of the results of the number of statements for each indicator for students in the 2020 class. Based on the data obtained from the respondents, it can be concluded that the Lecture Activities of Class 2020 received a total frequency of 1485 with a percentage of 81.68%, while group discussion activities received a total frequency of 514 with a percentage of 77.87%. For the Use of Materials and Teaching Materials, Class of 2020 received a total frequency of 534 with a percentage of 82.27%, and

for Fluency in carrying out assignments, students received a frequency of 682 with a percentage of 82.66%. Therefore, overall, the level of response of Class 2020 students to lecture activities using E-Learning as a whole is 2952 with a percentage of 81.32%, which falls under the very good category with a range of 81%-100%.
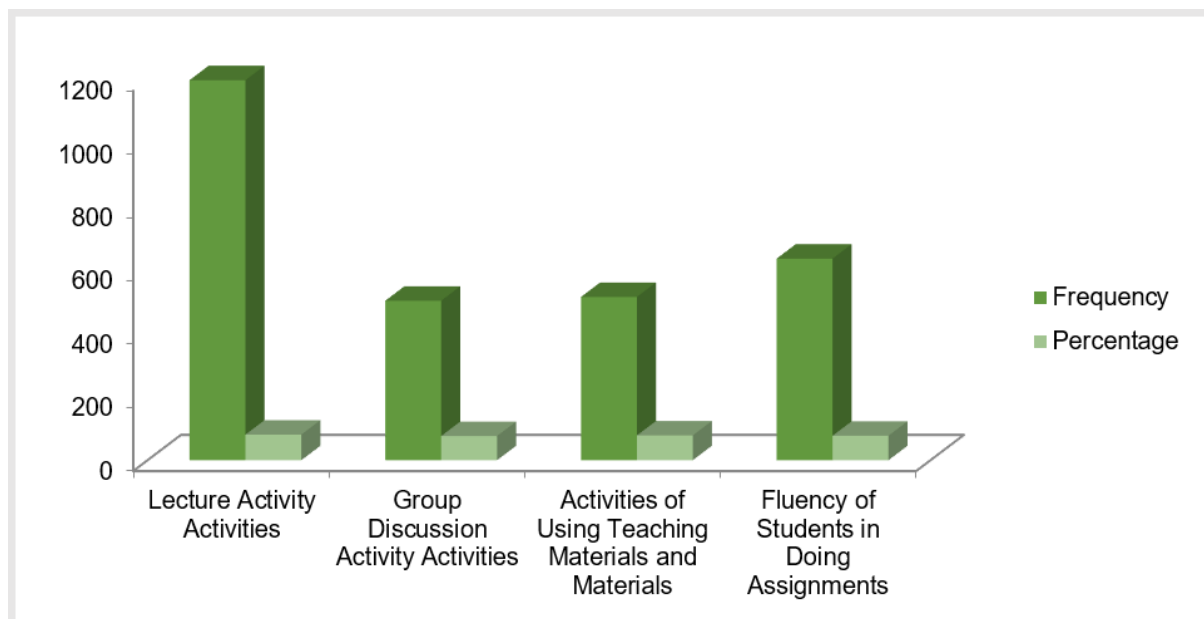

Figure 3. Frequency distribution of the class of 2021

Figure 2 presents the frequency distribution of the results of the number of statements for each indicator for students in the 2020 class. Based on the data obtained from the respondents, it can be concluded that the Respondents' Lecture Activities class of 2021 had a total frequency of 1,199 with a percentage of 80.74%, while Group Discussion Activities had a total frequency of 503 with a percentage of 76.21%. For the Use of Teaching Materials and Materials class of 2020, the total frequency was 515 with a percentage of 78.03%, and for Student Fluency in Carrying Out Assignments, the frequencies were several, totaling 636 with a percentage of 77.09%. Overall, the response rate of students from batch 2021 to activities with E-Learning as a whole had several frequencies of 2,835 with a percentage of 78.59% and was rated good, falling within the range of 61%-80%.

3.2   Data analysis

The aim of the descriptive analysis in this study is to provide an overview of the indicators of the research variables. In the descriptive analysis, the responses of the respondents to each indicator will be analyzed based on the average. Moreover, the analysis aims to determine the average value of respondents' answers for each individual. Below is the descriptive analysis of the research variable question indicators.

3.2.1   Lecture activities

The respondent's statements regarding the learning activity variables in using E-Learning at Universitas PGRI Sumatera Barat had a good response, with an average score of 67.12% in the class of 2019. In the class of 2020, the average value was 81.68%, which falls within the very good category, with a percentage range of 81%-100%. For the class of 2021, the average value was 80.74%, which falls within the good category, with a percentage range of 61%-80%. From these average scores, it can be seen that students' responses to lecture activities using E-Learning are quite positive. The use of E-Learning in learning activities can

increase student independence in learning, and it is already effective in motivating students. Through E-Learning, students can be motivated and actively involved in participating in their own learning.

3.2.2 Activities Group Discussion Activities

The respondents' statements on the activity variable for group discussion activities in the use of E-Learning at Universitas PGRI Sumatera Barat had a good response, with an average score of 66.02% in the class of 2019. From this average score, it can be seen that student responses to group discussion activities using E-Learning are quite good. Through activities using E-Learning, group discussion activities run effectively, and students are actively involved in discussion forums, and they respect each other's opinions in group discussions. In the class of 2020, the average value was 77.87%, and in the class of 2021, the average value was 76.21%, which falls within the range of 61%-80% with a good category. Based on the results of the descriptive analysis, it can be seen that the respondents were very satisfied with the learning activities at Universitas PGRI Sumatera Barat. It can be concluded that the respondents were satisfied with the group discussion activities using E-Learning at Universitas PGRI Sumatera Barat. From these average scores, it can be seen that students respond positively to group discussion activities using E-Learning. E-Learning activities are effective in facilitating group discussions, and students actively participate and respect each other's opinions in group discussions.

3.2.3 Activities Using Teaching Materials and Materials

The respondents' statements regarding the variable use of teaching materials and materials in using E-Learning at Universitas PGRI Sumatera Barat received a good response with an average score of 67.05% in the class of 2019. Based on the results of the data analysis that has been done, it is known that student responses to the activity of using material using E-Learning are quite good. Through activities in E-Learning, students can understand the material presented. The available material can increase students' learning motivation. The material presented is in the form of videos, power points, and pdfs, which are varied enough to make it easier for students to understand the material, so that students can easily access the material presented by the lecturer.

In the class of 2020, a percentage of 82.27% was obtained, which falls within the very good category with a range of 81%-100%. In the class of 2021, an average of 78.03% was obtained, which falls within the good category with a percentage range of 61%-80%. Based on the results of the descriptive analysis, it can be seen that the respondents were very satisfied with the E-Learning learning activities at Universitas PGRI Sumatera Barat. Therefore, it can be concluded that the respondents were satisfied with the use of teaching materials and materials in using E-Learning at Universitas PGRI Sumatera Barat.

Based on the results of the data analysis that has been done, it is known that student responses to the activity of using material using E-Learning are quite good. Through E-Learning activities, students can easily access and understand the material presented by the lecturer, which can increase their learning motivation. The available materials, in the form of videos, power points, and pdfs, are varied enough to make it easier for students to understand the material presented.

3.2.4 Fluency of students in doing assignments

The respondents' statements regarding the fluency of students in carrying out assignments using e-learning at Universitas PGRI Sumatera Barat received a good and very good response. From the results of the data analysis, it is evident that students' responses to the smooth running of activities in carrying out assignments using e-learning are quite positive.

Through e-learning activities, students can complete assignments quickly and efficiently. According to the students, all assignments given through e-learning are clear and easy to understand, resulting in timely submission of completed assignments.

4.   Conclusion

Based on the results of the research and discussion conducted by the researchers, this study has limitations. It aims to determine the student responses to using e-learning at Universitas PGRI Sumatera Barat, specifically in lecture activities, group discussion activities, the use of teaching materials and materials, and students' fluency in carrying out assignments. From the research results, it can be concluded that learning activities using e-learning are very effective, clear, and easy to understand. Therefore, lecture activities starting from teaching and learning activities, group discussions, using materials, and collecting assignments can be well followed by students. For further research, it is necessary to conduct a more extensive survey of student responses to using e-learning at Universitas PGRI Sumatera Barat so that the quality of the e-learning platform can continue to be improved to keep up with advances in technology and communication.

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Declarations

Author contributions

Faiza Rini conceived of and designed the analysis, performed the analysis, and wrote the paper. Liani Pratiwi collected the data, wrote the paper, and contributed to the analysis. Thomson Mary contributed to the analysis, provided data for the project, and also wrote the paper. Ang Ling Weay contributed to the analysis and interpretation of the data.

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Conflict of interest

The authors declare no conflict of interest.

Ethical clerance

The involvement of human subjects in this research complies with the Declaration of Helsinki.

References

Almaiah, M. A., & Abdul Jalil, M. (2014). Investigating Students' Perceptions on Mobile Learning Services. *International Journal of Interactive Mobile Technologies (IJIM)*, *8*(4), 31. https://doi.org/10.3991/ijim.v8i4.3965

Cherry, E. C. (1953). Some Experiments on the Recognition of Speech, with One and with Two Ears. *Journal of the Acoustical Society of America*, *25*(5), 975–979. https://doi.org/10.1121/1.1907229

Christensen, L. B. (2001). Experimental Methodology. In *Canadian Journal of Counselling and Psychotherapy* (8th ed.). Allyn and Bacon.

Coman, C., Țîru, L. G., Meseșan-Schmitz, L., Stanciu, C., & Bularca, M. C. (2020). Online Teaching and Learning in Higher Education during the Coronavirus Pandemic: Students' Perspective. *Sustainability*, *12*(24), 10367. https://doi.org/10.3390/su122410367

El-Sabagh, H. A. (2021). Adaptive e-learning environment based on learning styles and its impact on development students' engagement. *International Journal of Educational Technology in Higher Education*, *18*(1), 1–24. https://doi.org/10.1186/S41239-021-00289-4/TABLES/4

Freeman, R. J. (1960). Quantitative Methods in R&D Management. *California Management Review*, *2*(4), 36–44. https://doi.org/10.2307/41165403

Jaya Saragih, M., Mas Rizky Yohannes Cristanto, R., Effendi, Y., & Zamzami, E. M. (2020). Application of Blended Learning Supporting Digital Education 4.0. *Journal of Physics: Conference Series*, *1566*(1), 012044. https://doi.org/10.1088/1742-6596/1566/1/012044

Maslov, I., Nikou, S., & Hansen, P. (2021). Exploring user experience of learning management system. *The International Journal of Information and Learning Technology*, *38*(4), 344–363. https://doi.org/10.1108/IJILT-03-2021-0046

Matsuyama, Y., Nakaya, M., Okazaki, H., Lebowitz, A. J., Leppink, J., & van der Vleuten, C. (2019). Does changing from a teacher-centered to a learner-centered context promote self-regulated learning: A qualitative study in a Japanese undergraduate setting. *BMC Medical Education*, *19*(1), 1–12. https://doi.org/10.1186/S12909-019-1550-X/FIGURES/1

Mukarromah, U., & Wijayanti, W. (2021). Implementation of the online learning at vocational high school during Covid-19: Between obligations and barriers. *Jurnal Pendidikan Vokasi*, *11*(1). https://doi.org/10.21831/jpv.v11i1.37110

Nassaji, H. (2015). Qualitative and descriptive research: Data type versus data analysis. *Language Teaching Research*, *19*(2), 129–132. https://doi.org/10.1177/1362168815572747

Novializa, R., Rini, F., & Irsyadunas. (2022). Analisis Tingkat Kepuasan Dengan Metode EUCS Pada Mahasiswa. *Teknik Elektro Dan Vokasional*, *8*(2), 213–218.

Nurhadi, N., & Harahap, M. I. (2021). Teacher's Responsibility in Islamic Education (Relevance of Hamka and Hasan Langgulung Thought). *PALAPA*, *9*(1), 137–181. https://doi.org/10.36088/palapa.v9i1.1065

Rawashdeh, A. Z. al, Mohammed, E. Y., Arab, A. R. al, Alara, M., & Al-Rawashdeh, B. (2021). Advantages and Disadvantages of Using e-Learning in University Education: Analyzing Students' Perspectives. *Electronic Journal of E-Learning*, *19*(3), 107–117. https://doi.org/10.34190/EJEL.19.3.2168

Rini, F., Tanto, & Purnama, F. (2021). Efektifitas Pengembangan E-Learning dengan LMS Moodle dan Laboratorium Virtual Pada Pendidikan Tinggi. *ELTI*, *3*(1), 20–27.

Ross, S. (2010). *A First Course in Probability* (8th ed.). Pearson Education, Inc.

Schreurs, J., & Dumbraveanu, R. (2014). A Shift from Teacher Centered to Learner Centered Approach. *International Journal of Engineering Pedagogy (IJEP)*, *4*(3), 36. https://doi.org/10.3991/ijep.v4i3.3395

Shi, F. (2015). Study on a Stratified Sampling Investigation Method for Resident Travel and the Sampling Rate. *Discrete Dynamics in Nature and Society*, *2015*, 1–7. https://doi.org/10.1155/2015/496179