



## Analysis of Media Use and Learning Interaction to Improving Student Engagement

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DOI: 10.15294/dp.v17i1.35304

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### History Article

Received February 28, 2022

Approved May 12, 2022

Published June 27, 2022

### Keywords

Lecturer-Student  
Interaction; Multimedia;  
Student Engagement

### Abstract

This research aimed to test the effect of multimedia and lecturer-student interaction on student engagement in students of the Faculty of Economics, Universitas Negeri Padang. This type of research was descriptive quantitative. The sample was taken by using the Slovin formula with 358 respondents. The measure used in the study was the likert scale. The type of data used in this study was primary data obtained through the dissemination of questionnaires to students of the Faculty of Economics, Universitas Negeri Padang. The analysis method used SEM PLS analysis using SmartPLS 3.0. The results of this study showed that: lecturer-student interaction had a significant effect on student engagement. Multimedia had a significant effect on lecturer-student interaction. Multimedia had no significant effect on student engagement. The implication of this study was that empirically in learning that online student interaction was very necessary in order to increase student involvement in learning. Then, the use of multimedia affected student involvement in learning. The future research agenda needs to study more deeply the use of multimedia on student involvement in learning.

### How to Cite

Yulhendri, Y., et. al.(2022).Analysis of Media Use and Learning Interaction to Improving Student Engagement.*Dinamika Pendidikan*, 17 (1), 37-47.

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p-ISSN 1907-3720

e-ISSN 2502-5074

## INTRODUCTION

The Covid-19 pandemic has made direct learning a distance learning approach to avoid crowds so that even at home, students can interact with lecturers. Distance learning is one solution to minimize crowds which have a significant impact on the spread of Covid-19, according to the circular letter of the Ministry of Education and Culture, Indonesia No. 3, which urges organizing the learning process from home with an online model.

According to Mustofa et al. (2019); Yustika & Iswati (2020) the online learning system is distance education through teaching carried out anywhere, anytime, and does not have to use a study room. E-learning is a breakthrough in education that utilizes information technology such as blended e-learning, distance e-learning, and flipped learning. Thus, the main characteristic of online learning is distance learning. However, this learning can still help students in designing an effective online learning environment and still actively involve students in learning (Muthuprasad et al., 2021).

Distance learning and online have emotional, behavioral, and cognitive involvement of students in line with the results of research conducted by Liu et al., (2016) that distance learning affected the cognition of students involved in the presence of online learning to predict student learning performance. The success and activeness of students in online learning are influenced by student engagement because affective learning, student discussion participation, and cognitive in the classroom in the learning process can affect class participation and success in learning (Cho et al., 2022).

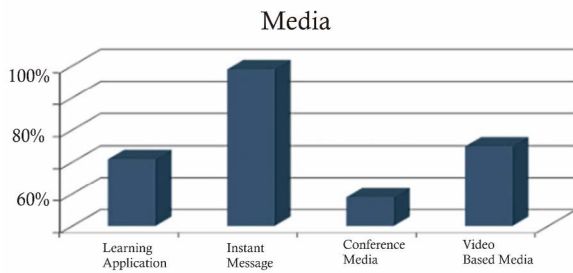
Student engagement is a learning activity that encourages students to think effectively and cognitively (Bond, 2020; Melati & Harnanik, 2021). Student engagement is a learning activity that positively impacts students, teachers, lecturers, students, or schools. Usually, students who have student engagement have good communication skills, high-spirited dis-

cussions, loyalty, and work hard on the tasks and roles mandated as students (Kahu & Nelson, 2018). Students realize the importance of Student Engagement. In line with the research describing that at this time, educators and education policymakers focus on student engagement to solve problems for students who have low skills, are lazy, pessimistic, and give up easily in their educational environment.

To overcome the problem of student engagement, it is necessary to have quality learning teachers or lecturers by using technology in the form of multimedia to help develop knowledge. Multimedia is a presentation of material using words and pictures; these words are in verbal information and images and the form of static or animated graphics or videos (Hasan, 2017). Using the unique features provided by the digital learning environment in explaining learning can improve cognitive and affective learning so that it can lead to increased student learning (Mayer, 2019).

Multimedia is used in the learning process because it can develop sensory abilities and attract attention to interest in learning. Multimedia enhancements include video and audio elements, recorded lecture presentations (power point), quiz diagrams, and interactive puzzles (Hasan, 2017). By using this media, you can see or choose different student learning styles so that it can be used as a guide for which media is suitable for use (Birch et al., 2017).

Different learning styles affect students in the process of understanding the information obtained, for example the difference between face-to-face learning and online learning based on technology or multimedia (Khan et al., 2020). Multimedia can present information that can be seen, heard, and done simultaneously so that the selection of the right media affects student learning style factors in determining learning performance. This is because students can be responsible for the results obtained. The utilization of media will lead to reciprocal interaction between lecturers and students.



**Figure 1.** Graphics of Online Learning Learning Media

Source: Survey Data of Ministry of Education and Culture (2020)

Figure 1 illustrates that, on average, the most widely used learning media is instant messages by 98%, while conference media is only carried out by 18%. As we know, learning media is a success of the learning process in achieving the goals. In the online learning process, video-based media has been implemented by 50%, and learning applications by 42%; video-based media and online learning applications used are supporting tools and solutions used in explaining the material, so that meaning and messages are conveyed to students.

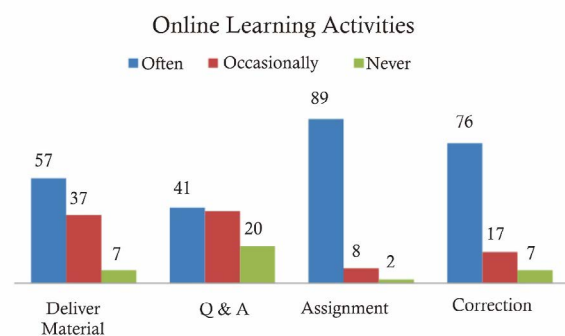
Using video-based media can increase students' interest and motivation in following lessons, but the use of internet-based media can also lead to low student interest in learning due to misuse of media to access games such as online games. This is in line with thesis research conducted by Nuraisyah et al. (2021), regarding the analysis of the use of internet media on the interest in learning of class XII students at senior high schools in Bandar Lampung.

Lecturer and student interaction is the core activity of education; apart from student interaction, peer interaction and student motivation are also significant in the learning process (Khan et al., 2020). Interaction can also improve the ability to work in groups, both face-to-face and online learning, with a focus on repeated interactions that will lead to an effective and productive collaboration in the teaching process (Proto et al., 2019). This is supported by research studies conducted Näykki

et al. (2014), collaborative learning and well-performing groups could provide feedback and ask complex questions, leading to higher cognitive processes.

Collaborative learning includes the mutual involvement of students in building knowledge and solving problems together. Interaction in collaborative learning is characterized by theoretical arguments, negotiations, and questions (Naykki et al., 2014). This requires the commitment of students in joint task activities so that it can be realized through collaborative learning activities to involve students in interactive knowledge construction (Strauß & Rummel, 2020).

Interactions in an online environment show positive benefits from interpersonal interactions, such as higher student satisfaction in discussions and also an increase in student academic achievement. The use of interpersonal interaction by educators still lacks which interpersonal strategies are the best in the learning process and effective student satisfaction, so teachers are pressured to improve the online quality of students but do not know the strategies to encourage students to interact (Paquette, 2016). This is in line with research conducted by Cole et al. (2014) interpersonal interaction could decrease when there was a lack of interaction between students with faculty and classmates, resulting in student dissatisfaction.



**Figure 2.** Graph of Online Learning Activities

Source: Results of the Ministry of Education and Culture's 2020, quick survey of online learning activity innovations (2020)

Based on the Figure 2, which the Ministry of Education and Culture carried out in 2020, online learning activities in the interaction of delivering material were still very low, only 57% were carried out, while both question and answer sessions in the discussion process also obtained the lowest results compared to delivering the material which was carried out around 41% while in giving assignments and corrections can be seen getting the highest results, namely 89% for assigning assignments, and 76% for correcting assignments.

Based on the quick survey data conducted by the Ministry of Education and Culture, Indonesia, there are still gaps in online learning activities where students are still found to be significantly less involved in the interaction of the question and answer session. The delivery of material is low, even though in the learning process activities, the discussion process in the question and answer session can liven up the classroom atmosphere when learning.

However, the use of internet learning media can reduce the interest and quality of student learning if students abuse the media by accessing games such as online games; this is in line with research conducted by Nuraisyah et al. (2021), regarding the analysis of internet media use on the learning interest. Based on the phenomena described above and differences in opinion from previous research, then the purpose of this research was test the effect of multimedia and lecturer-student interaction on student engagement in students of the Faculty of Economics, Universitas Negeri Padang.

## METHODS

This research was a survey with a student population of the Faculty of Economics, Universitas Negeri Padang, totaling 3,448 students from 2017 to 2020, consisting of seven majors, and 358 respondents were randomly selected. Research variables were measured by using a Likert scale by adopting several studies where the questionnaire for multimedia

was adopted (Smith Jr. et al., 2011), interaction learning dopted the questionnaire developed by Allen et al. (1989); Zhu (2006); Rhode (2009); Vuopala et al. (2016). Meanwhile, the Student Engagement questionnaire was adopted (Baanqud et al., 2020). Student engagement consists of 2 dimensions, namely cognitive engagement and behavior engagement. Indicator variable is shown Table 1.

**Table 1.** Indicator Variable

Variable	Indicator
Multimedia (M)	1. Videos 2. Text 3. Picture 4. Animation
Lecturer-Student Interaction (IDM)	1. Density 2. Centralization 3. Asking questions 4. Answer the question 5. Presenting data 6. Perform analysis 7. Explaining ideas 8. Compiling papers
Cognitive Engagement (CE)	1. Understand 2. Remember 3. Analyze material 4. Summarizing material 5. Making plans
Behavariol Engagement (BE)	1. Leave a comment 2. View content 3. Collect assignments 4. Participate 5. Give appreciation 6. Dislikes "dislike"

Source: Processed data (2021)

Data analysis with verification analysis in this study used statistical test tools, namely the variance-based structural equation test with the alternative partial least square (PLS) method and hypothesis testing was carried out based on the results of testing the structural model (inner model) which included parameter coefficients and t-statistics. Another method to assess discriminant validity was to compare the Avarage Variance Extracted

(AVE) for each construct with the correlation between constructs and other constructs with the model. The construct is said to be valid if it has an AVE value 0.5.

**RESULT AND DISCUSSION**

**Structural model evaluation (Inner Model)**

This test model was carried out to find out whether there was a relationship between variables in the model. This analysis process determined the bootstrapping calculation method when it was in SmartPLS which aimed to see the relationship that occurred between latent variables. Here are the test results with bootstrapping calculations (Figure 3).

The test results from the bootstrapping method created a t-value in each path associated with each indicator item. The test results from the bootstrapping method had the aim of seeing the relationship between indicators and research variables and later can help analyze the research hypothesis. The following is Table 3 path coefficient (mean, STDEV, T-value) which will show a significant relationship or

not in the hypothesis.

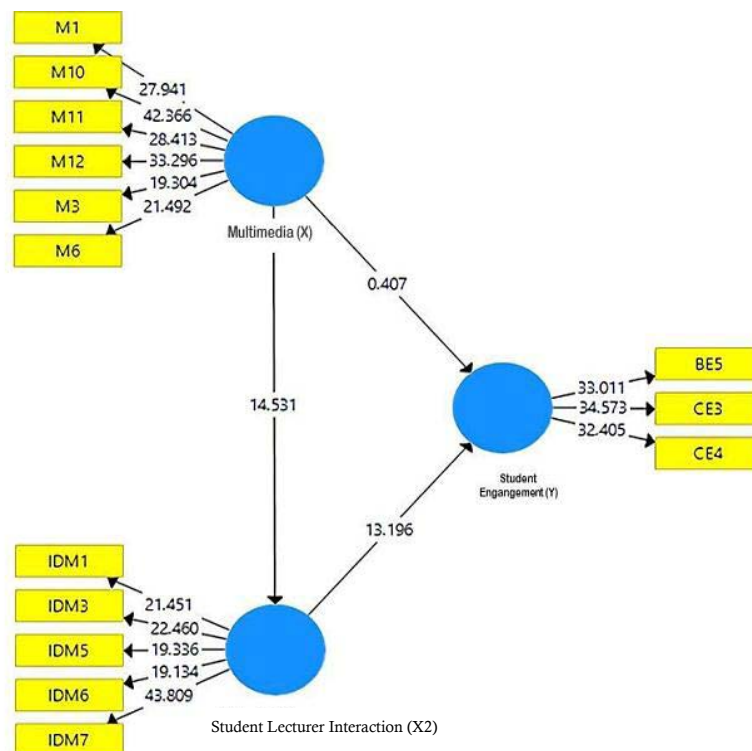
**R-Square (R2) Analysis**

In assessing the model with PLS, it began by looking at the R-square for each independent latent variable. The R-square value is the value owned by the endogenous variable (Y). The value of R-square is used to measure the level of variation of changes in the independent variable to the dependent. The criteria for limiting the R-square value can be divided into three qualifications, namely 0.67 (Strong), 0.33 (Medium), and 0.19 (Weak). Following are the results of the R-square estimation using SmartPLS (Table 2).

**Table 2.** Results of R-square Analysis

Variable	R-square
Multimedia	-
Lecturer-Student Interaction	0.497
Student Engagement	0.690

Source: Processed Primary Data (2021)



**Figure 3.** Bootstrapping Model  
Source: Processed Primary Data (2021)

Table 2 proves that the R-square value of the student engagement variable was 0.740, this result showed that 70.4% of the student engagement variable was influenced by multimedia variables and lecturer-student interaction. Meanwhile, for the variable of lecturer-student interaction, it was 0.497, this result showed that 49.7% of the multimedia variable and the lecturer-student interaction was influenced by the variable of student engagement.

PLS model, goodness of fit assessment can be seen from the value of Q2. The value of Q2 has the same meaning as the coefficient of determination (R2) in regression analysis, where the higher R2, the more fit the model can be with the data. A Q-Square value > 0 indicates the model has predictive relevance, on the other hand if the Q-Square value < 0 indicates the model lacks predictive relevance. From the table Q2 can be calculated as follows:

$$Q2 = 1 - (1 - R12) (1 - R22) \dots (1 - Rp2)$$

$$Q2 = 1 - (1 - 0.740) (1 - 0.497)$$

$$Q2 = 0.851112$$

The results above showed a predictive relevance value of 0.84470, so it can be interpreted that 85.1112% of variations in student engagement variables were explained by the variables used in the model. 15.56% was explained by other factors outside the model. Based on these results, the structural model in this study had a good goodness of fit.

### Hypothesis test

The direct effect hypothesis test was carried out by looking at the t-statistics generated by the structural model (inner model). The research hypothesis can be accepted if the t-statistic > 1.96 and the P Value 0.05. The following are the results of the direct influence hypothesis test (Table 3).

In PLS statistical testing, each hypothesized effect was carried out by using simulation. In this case, the bootstrapping method aimed to reduce the problem of abnormal research data. The following are the results of testing using bootstrapping from PLS analysis, namely: first, the results of the first hypothesis test (H1): the effect of lecturer-student interaction on student engagement. The results of the first hypothesis (H1) test showed that there was a lecturer-student interaction variable with student engagement that the t-count value was 13,196. The value was greater than the value of t-table (1.96). Then the P Value obtained was 0.000. This result means that there was a significant effect between lecturer-student interaction and student engagement. The path coefficient value was 0.723 which means that the first hypothesis was accepted.

Second, the results of the second hypothesis (H2) test: the effect of multimedia on lecturer-student interactions. The results of the second hypothesis (H2) test showed that the multimedia variable with student-lecturer interactions showed a t-count value of 14.531.

**Table 3.** The Direct Effect Results

Direct Effect	Original Sample (O)	Mean Sample (M)	Deviation Standart ( O/STDEV )	t-statistic	p-value
Lecturer-Student Interaction → Student Engagement	0.723	0.722	0.055	13.196	0.000
Multimedia → Lecturer Student Interaction	0.681	0.677	0.047	14.531	0.000
Multimedia → Student Engagement	0.023	0.022	0.068	0.407	0.684

Source: Processed Primary Data (2021)

This value indicated that it was greater than the t-table value (1.96). This condition showed that there was a significant influence between multimedia and lecturer-student interaction. So that the coefficient value was 0.681 and the P value obtained was 0.000. This means that if the multimedia was getting better, the interaction between lecturers and students would increase. It means that the second hypothesis was accepted.

Third, the results of the third hypothesis (H3) test: the effect of multimedia on student engagement. The results of the third hypothesis (H3) test showed that there was a multimedia variable with student engagement which showed a t-count value was 0.407 so that the value was greater than the value of t-table (1.96) thus, showing the relevant influence between multimedia and student engagement. The path coefficient value was 0.023 and the P value obtained was 0.684. This result means that there was no significant effect of multimedia between student engagements. It means that the third hypothesis was rejected.

### **The Effect of Lecturer-Student Interaction on Student Engagement**

The analysis results of interaction variable between lecturers and students obtained an average score of 4.33 with a TCR of 78.82% which was in the strong category, which means that lecturer-student interactions in the learning process could be said to be high and must be maintained. While analysis results of the distribution of student engagement variables obtained an average score of 4.08 with a TCR of 66.77% which was in the strong category, which means that student engagement of students in the economics faculty was high.

However, based on the results of variable analysis by testing using SmartPLS, lecturer-student interaction had a significant effect on student engagement for students of the Faculty of Economics, Universitas Negeri Padang. Based on the results of the calculations, the coefficient value was 0.723 with t-count of 13.196% greater than the value of t-table (1.96). Thus, these results showed that there was a relevant and positive influence between

lecturer-student interactions on student engagement.

So, the conclusion that can be obtained from the results of this study was that the better and higher the interaction between lecturers and students would have a significant impact on student engagement in the economics faculty. If the students of the economics faculty felt that the lecturer-student interaction was getting higher, then this would significantly increase the student engagement of the students of the economics faculty.

The results of this study were also supported by Howe et al. (2019) which stated that lecturer-student interaction had a significant effect on student engagement. Furthermore, it was also supported by research Kuswoyo et al. (2021) which stated that there was a significant influence between teacher interpersonal communication, student engagement and self-efficacy simultaneously on school well-being. According to Sarafino & Smith (2011) said that lecturer support is in the form of interaction with students, lecturers can provide support in the form of attention so that students feel that someone is providing solutions when they are difficult.

Interaction with lecturers in student engagement also helps students to be motivated in participating in activities in class. In fact, lecturers have the authority to create a conducive climate in the classroom, such as students participating in discussions and providing opportunities for students to ask questions, if there are still those who do not understand the learning material being taught.

Furthermore, according to Fatimah & Cangara (2016) communication between lecturers and students is trying to improve human relations which aims to achieve success in the teaching and learning process, especially in interpersonal communication. With the establishment of a harmonious relationship between lecturers and students, it is hoped that it can assist students in increasing student learning motivation so that success in the teaching and learning process can be achieved through effective interpersonal communication between lecturers and students.



### **The Effect of Multimedia on Lecturer Student Interaction**

The distribution of multimedia variables to the average value of the multimedia variable was 4.42, and TCR 64.14% was the strong type. This means that multimedia can be said to be high and must be maintained. While the results of the analysis of the distribution of the interaction variable between lecturers and students obtained an average score of 4.33 with a TCR of 78.82% which was in the strong category, which means that the interaction between lecturers and students in the economics faculty was high.

Based on the analysis of multimedia variables that had been carried out, the multimedia results had a significant effect on student engagement of students of the economics faculty, as a result of the calculation results obtained from the path coefficient value of 0.681 with a count of 14,531. The values obtained were more significant than the t table value (1.96). The conclusion is that there was a relevant and positive influence on multimedia with lecturer-student interactions.

So, it can be concluded that if the multimedia was getting better and more enjoyable, it would significantly affect the high lecturer-student interaction. For example, an economics faculty student feels that multimedia in the learning process is very important in achieving learning objectives. In that case, multimedia has its charm and can help lecturers in the learning process and increase lecturer-student interaction in the classroom. The learning process takes place actively involving students.

The results of this study were also supported by research conducted by Alabdulkareem (2015), which showed that learning multimedia had a significant influence on educative interactions carried out by lecturers and students. Furthermore, it was also supported by research conducted by Misra & Mazelfi (2021), which stated a positive and significant influence between the use of multimedia and lecturer-student interpersonal communication. This means that lecturer-student

interaction is a reciprocal communication that changes each other and has a specific purpose of achieving educational goals. With the reciprocal relationship between lecturers and students in the learning process, students can access information sources directly to increase curiosity, interest, creativity, and motivation to learn.

### **The Effect of Multimedia on Student Engagement on Students**

The distribution results of multimedia variables to the maximum average value of multimedia variables, namely 4.42 and TCR 64.14% belong to the strong group so that multimedia in the learning process can be said to be high and must be maintained. Meanwhile, the distribution results of student engagement variables obtained an average value of 4.08 against a TCR of 66.77% including in the strong group so that it showed that student engagement of students in the economics faculty was quite high.

However, based on the results of the analysis using SmartPLS, multimedia had no significant effect on student engagement. This was because the calculation results obtained path coefficient value of 0.023 with t-count of 0.407, the value was lower than the value of t-table (1.96). These results indicated that there was no significant effect between multimedia and student engagement.

So, the conclusion that can be obtained in the results of this study was that multimedia had no significant effect on student engagement. Multimedia was not an influence for students to increase student engagement in the learning process even though the multimedia used was very interesting in the learning process, in this case it did not mean that students did not like multimedia as a tool to facilitate the process of understanding learning

In other words, students have a desire to increase student engagement regardless of the multimedia used. Students will ignore multimedia because there are other factors that can improve the learning process such as student motivation and interest in participating in the



learning process. This means that whether or not the media used in the learning process is good or not, it cannot be used as a reference for students in improving the learning process, but students will show other factors that they think can improve understanding in following the learning process.

The results of this study were different from the results conducted by Anwar et al. (2019); Primamukti & Farozin (2018), which stated that there was a significant influence of multimedia on students' interest in learning. Furthermore, research conducted by Dharmayana et al. (2012) which stated that there was a positive and significant influence on student involvement as a mediator of competence and academic achievement. In this case, the emotional involvement of students causes students to have and realize their goals for assignments and be responsible for academic tasks so that multimedia in the teaching and learning process is very helpful for learning success.

Through multimedia, students can use all their senses. According to Sardiman (2012), media are various components in a student's environment that stimulate learning. So, multimedia can help lecturers in the teaching process, especially in managing material in text, video, audio, images, and animation. Therefore, multimedia is an opportunity for students to develop learning techniques so that they can improve learning outcomes for the better.

## CONCLUSION

Based on the results of research and discussions that had been carried out on the effect of multimedia and lecturer-student interaction on student engagement of the students of the Faculty of Economics, Universitas Negeri Padang, it can be concluded that there were interaction and its relationship with student engagement and multimedia on interaction, but there was not enough empirical evidence of a relationship between multimedia and student engagement.

Lecturer-student interaction variables significantly affected student engagement of

students. This showed that good lecturer-student interaction could increase student engagement of students of the Faculty of Economics, Universitas Negeri Padang. Multimedia variables had a significant effect on lecturer-student interactions among the students. This showed that good multimedia could improve the process of lecturer-student interaction among students. Multimedia variables had no significant effect on student engagement. This showed that multimedia could not be guaranteed to increase student engagement of faculty of economics students during the learning process.

The recommendation that the author gives for future research agenda that needs to be carried out by further researchers is how to add empirical research on the relationship between multimedia and student engagement and explore more profoundly cognitive engagement, emotional engagement, and behavioral engagement in learning, especially in the use of web-e-learning based learning.

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