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Analysis of Student Interests and Learning Outcomes related to Biology Teachers' Creativity in Using LMS

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Abstract

Distance learning in pandemic situation requires teachers to take advantage of digital platforms includes learning management systems (LMS) to continue learning activities. The purpose of this study is to analyze how much influence the creativity of teachers in using LMS has on students' interest and learning outcomes during the Covid-19 pandemic. The approach in this research is quantitative with ex post facto design. The sample is 178 students of class XI IPA SMAN 9 Bandar Lampung. Research data was obtained through questionnaires distributed online, as well as documentation of mid-semester assessment scores from Biology teachers. The results proves that the creativity of teachers 1, 3 and 4 has a significant influence on student learning outcomes. Reinforced by the coefficients sequentially, namely: 0.646, 0.675, and 0.812, but the creativity of teachers 1, 2, and 4 has no significant effect on student learning outcomes . It can be concluded that teacher creativity in utilizing LMS can affect student learning interest, but is not able to have a significant impact on student learning outcomes which have the potential to be influenced by other internal and external factors.

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INTRODUCTION

Towards 2020 the world was shocked by the emergence of a new virus called Corona, often also called Covid-19 (Coronavirus Disease) and has spread to 221 countries and territories or regions throughout the world (WHO, 2021). With the high number of people infected with Covid-19, since the beginning of the entry of this outbreak into Indonesia, the government has issued many policies, evaluations and solutions to continue to suppress the surge in the addition of positive patients. One of them in the world of education is the issuance of Circular Letter Number 4 of 2020 concerning the Implementation of Educational Policies in the Emergency Period for the Spread of Coronavirus Disease (COVID-19), which contains information on the cancellation of the 2020 National Examination, distance learning regulations (PJJ), regulations for implementing school exams and grade promotions, new student admissions regulations (PPDB) and School Operational Assistance Funds.

In regard to distance learning, which has been started since March 2020, there have been major changes in a short period of time at all levels of formal education, starting from the lowest levels such as Early Childhood Education to the highest levels such as diplomas and bachelor's degrees. This is corroborated by Belawati & Nizam's statement (2020) if the Covid-19 pandemic makes all lecturers in all universities ready or not ready to transform to the digital revolution, because the learning model must be changed to be network-based. A similar phenomenon also occurs at the high school/MA equivalent level of secondary education. Teachers and students who have been carrying out conventional teaching and learning activities, namely face-to-face, must be able to quickly adapt to online learning methods so that the planned teaching and learning activities can still be carried out to completion.

The change from conventional learning methods to being network-based also has several advantages such as "distance learning provides convenience and opportunities in various conditions" (Ratu et al., 2020). As the name implies, Abidin et al. (2020), concludes that distance learning is carried out outside the proper place without the presence of teachers and students physically in the same place and time, therefore this learning model emphasizes more on student independence in the learning process. In addition, teachers as facilitators are required to be able to think creatively in designing and sharing learning content through several online platforms that are easily accessible by students such as Live Video Conferences, Learning Management Systems (LMS), Mobile Applications and Chat Applications, namely WhatsApp, Telegram, Line, and others.

The learning management system is a platform that is quite widely used by several schools in Indonesia because it has various features that support the online learning process, such as discussion forums, learning resource curricula, quizzes, assignments, types of academic information, and other student data management that are considered helpful. teachers to continue to provide subject matter in an organized and well archived manner (Wijayanti et al., 2017).

The use of platform this was originally intended to facilitate teaching and learning activities during the pandemic, where meetings between teachers and students were held virtually to prevent the spread of Covid-19 in the Education cluster. However, this needs to be studied again, whether the selection and use of the platform by schools and teachers has a positive or negative effect on the quality of students. Because based on research conducted by the Ontario Confederation of University Faculty Associations, it showed that out of 2700 participants consisting of students, faculty and librarian, 62% of students and 76% of participants from faculty and librarian agreed that changing the learning system from offline to online brought negative impact on the quality of education (Lewis, 2020). Therefore, the author wants to prove whether teacher creativity in using LMS can affect student interest in learning and learning outcomes, because these two indicators can be used as a benchmark for the quality of education in a school.

RESEARCH METHOD

The study was conducted at SMAN 9 Bandar Lampung in the Even Semester of the 2020/2021 Academic Year, the data collection process was carried out from March to May 2021. The design of this

research was quantitative with ex post facto design. The research subjects were 178 students of class XI IPA SMAN 9 Bandar Lampung from 252 students of XI IPA which were divided into 7 different classes and three different teachers. The data collection method was carried out by distributing questionnaires via google form and obtaining documentation of students' Odd Semester Biology PTS scores from the relevant Biology teacher. The questionnaire instrument contains student responses about the teacher's creativity on their interests and learning outcomes, which in total consists of 40 statements. Data analysis includes analysis of the validity of the questionnaire by experts, variable descriptions of teacher creativity, interest in learning, and learning outcomes, normality analysis, correlation analysis, and simple linear regression analysis.

RESULTS AND DISCUSSION

Validity of the Research Questionnaire

The validation of the questionnaire was carried out in April 2021, by two lecturers at the Biology education program at Universitas Negeri Semarang. The validity of the questionnaire was assessed based on several aspects, including: (1) clarity of instructions for use, (2) use of words that are easy to understand and do not have multiple interpretations, (3) use of good and correct language, (4) conformity of statements with indicators, and (5) the ability of statements in expressing students' opinions.

Table 1 Average Score of Questionnaire Validation

No	Assessment Indicator	Validator 1		Validator 2	
		Assessment Score	Description	Assessment Score	Description
1.	Clarity of usage instructions	4	Appropriate	5	Very Appropriate
2.	Word selection that is easy to understand and does not have multiple interpretations	4	Appropriate	5	Very Appropriate
3.	Use of proper and correct language	4	Appropriate	5	Very Appropriate
4.	Kesesuaian pernyataan dengan indikator	4	Appropriate	4	Appropriate
5.	Conformity of statements with indicators	3	Enough	3	Enough
	Conclusion	Use with revision			

From the validation process carried out by experts, scores of 4 and 5 were obtained for aspects of clarity of usage instructions, selection of words that are easy to understand and do not have multiple interpretations, and use of proper and correct language. While the aspect of the suitability of the statement with the indicator gets a score of 4, and the aspect of the ability of the statement in expressing student opinions gets a score of 3. Based on the scores given by the experts for each aspect, both agree to provide conclusions on the validation process carried out, in the form of valid validation results with revisions.

There are two things that were revised in this research questionnaire based on the validator's suggestions and comments. The first is that the use of the words KI (Kompetensi inti / Core Competences) and KD (Kompetensi Dasar / Basic Competences) in the statement is deemed inappropriate, because not all students know these terms, the words KI and KD are omitted. Then the second is the sentence "other students" which is considered to be confusing for students, so the sentence "other students" is changed to

"friends", so that students more easily understand who the object in question is.

Description of Research Variables

1) Description of Teacher Creativity in Using LMS Variables

The variable of teacher creativity in using LMS consists of 3 indicators which are then further elaborated into 15 statement items and calculated using a Likert scale. Each statement is rated with a score range of 1 – 5, until a minimum expected score of 15 and a maximum score of 75 are obtained. Therefore, the length of the interval class can be calculated as follows.

$$Interval\ class\ lenght = \frac{(\text{Highest score} - \text{Lowest score} + 1)}{\text{Number of interval classes}} = \frac{75 - 15 + 1}{5} = 12.2$$

Table 2 Frequency Distribution of Teacher Creativity in Using LMS

No	Interval Score	Frequency				Percentage
		Teacher 1	Teacher 2	Teacher 3	Teacher 4	
1	15 – 27	0	0	0	0	Very low
2	27 – 39	0	0	0	2,1%	Low
3	40 – 51	12%	25%	14.8%	14.6%	Moderate
4	52 – 63	61.2%	50%	36.1%	20.8%	High
5	64 – 75	26.8%	25%	49.1%	62.5%	Very high

Based on Table 2, the data are classified based on the class taught by the relevant Biology teacher, which is expected to be able to get a representation of the level of creativity of the tutor in the view of the students being taught, especially in the use of google classroom. From these data, it is known that in general, Biology teachers at SMAN 9 Bandar Lampung have quite high creativity in using LMS. Table 2 also does not show that there are students who give a very low assessment of the creativity of Biology teachers, although there are 2.1% of teacher 4 students stating that the creativity of Biology teachers is still low, this does not have a significant effect on the results obtained. As many as 61.2% of teacher 1 students and 50% of teacher 2 students gave an assessment that the teacher's creativity was at a high level. Then for teachers 3 and 4, 49.1% and 62.5% of students stated that their teacher had a very high level of creativity. The following is a bar chart of the frequency distribution of teachers' creativity in using LMS at SMAN 9 Bandar Lampung.

2) Description of Student Learning Interest Variables

Learning interest variables are arranged based on 6 indicators which are then elaborated into 25 statements and calculated using a Likert scale. Each statement is rated with a score range of 1 – 5, until a minimum expected score of 25 and a maximum score of 125 are obtained. Therefore, the length of the interval is 20

Table 3 Frequency Distribution of Student Interest

No	Interval Score	Frequency				Percentage
		Teacher 1	Teacher 2	Teacher 3	Teacher 4	
1	25 – 45	1,6%	0	0	0	Very low
2	46 – 65	10.4%	12.5%	10.7%	6.3%	Low
3	66 – 85	38.8%	25%	40.4%	23%	Moderate
4	86 – 105	37.3%	37.5%	40.4%	54.1%	High
5	106 – 125	11.9%	25%	8.5%	16.6%	Very high

From table 3 it is known that only 1.6% of teacher 1 student respondents have very low interest in learning and <13% of teacher 1, 2, 3, and 4 student respondents have low learning interest. Meanwhile, most of the respondents were teachers 2 and 4, with a percentage of 37.5% and 54.1% in the high criteria. Meanwhile, teacher 1 has a high criterion of 37.3% and a medium criterion of 38.8%. Teacher 4 has the same percentage for the medium and high criteria, which is 40.4%. If viewed as a whole, it can be concluded that the learning interest of the respondents of class XI IPA SMAN 9 Bandar Lampung has an interest in learning at a moderate to high level in Biology subjects during the pandemic, because the percentage of criteria is very high and very low is < 20%.

3) Description of Learning Outcomes Variables

Analysis of student learning outcomes in Biology subjects was carried out with the student's Odd Semester Mid-semester (PTS) assessment scores. The analysis of learning outcomes was carried out twice, the first was based on the PTS score of the respondent students amounting to 178, and the second was an overall analysis of the Biology PTS scores for the odd semester students of class XI IPA SMAN 9 Bandar Lampung, amounting to 249 students.

Table 4 Distribution of Learning Outcomes Frequency 178 Students Questionnaire Respondents

Score	Percentage				Criterion
	Teacher 1	Teacher 2	Teacher 3	Teacher 4	
90 – 100	5,9%	0	0	2.3%	Very Good
70 – 89	44.7%	12.5%	40.4%	16.6%	Good
50 – 69	40.3%	68.75%	40.4%	41.6%	Insufficient
<50	9.1%	18.75%	19.2%	9.5%	Very Insufficient

With the minimum completeness criteria set by the teacher of 70, it can be concluded that 178 respondents, all of whom are evenly distributed from classes taught by teachers 1, 2, 3, and 4, the majority of student learning outcomes seen through PTS scores are in the less criteria. This can be seen from 68.75% of teacher 2 student respondents having poor learning outcomes, as well as 40.4% and 41.6% of teacher 3 and 4 student respondents, both of which are also in the poor criteria. Even though the percentage of teachers with good and poor criteria is the same with 40.4%, the absence of student respondents in very good criteria makes the majority of student learning outcomes of teacher 3 remain in the poor to very poor category. On the other hand, the majority of teacher 1 student respondents with a percentage of 44.7% have good learning outcomes, and the other 5.9% are very good. So that it can be said, of the four teachers, only teacher 1 whose student respondents had the most satisfactory learning outcomes.

Table 5 Frequency Distribution of Biology Learning Outcomes All Students XI IPA SMAN 9 Bandar Lampung

Score	Percentage				Criterion
	Teacher 1	Teacher 2	Teacher 3	Teacher 4	
90 – 100	5,7%	3.1%	0	1.6%	Very Good
70 – 89	47.2%	28.5%	34.8%	18.8%	Good
50 – 69	38.8%	54.2%	47.2%	34.7%	Insufficient
<50	8.3%	14.2%	18%	44.9%	Very Insufficient

Table 5 shows the frequency distribution of learning outcomes for all students of class XI IPA SMAN 9 Bandar Lampung, which in general are still in the poor criteria. The majority of teacher

students 2, 3, and 4 have poor learning outcomes, with the percentages respectively 54.2%, 47.2%, and 34.7%. Of the three teachers, <40% of the students got good to very good learning outcomes. However, for teacher 1, 47.2% of the students had good learning outcomes, and the highest percentage for students with very good learning outcomes was 5.7% in the class taught by teacher 1.

Normality Test

The data distribution is said to be normal if the p-plot graph shows the points are on or near the diagonal line. Variables of teacher creativity 1, 2, 3, and 4 on student learning outcomes, all show points that move away from the diagonal line, therefore in this variable there is no data that is normally distributed.

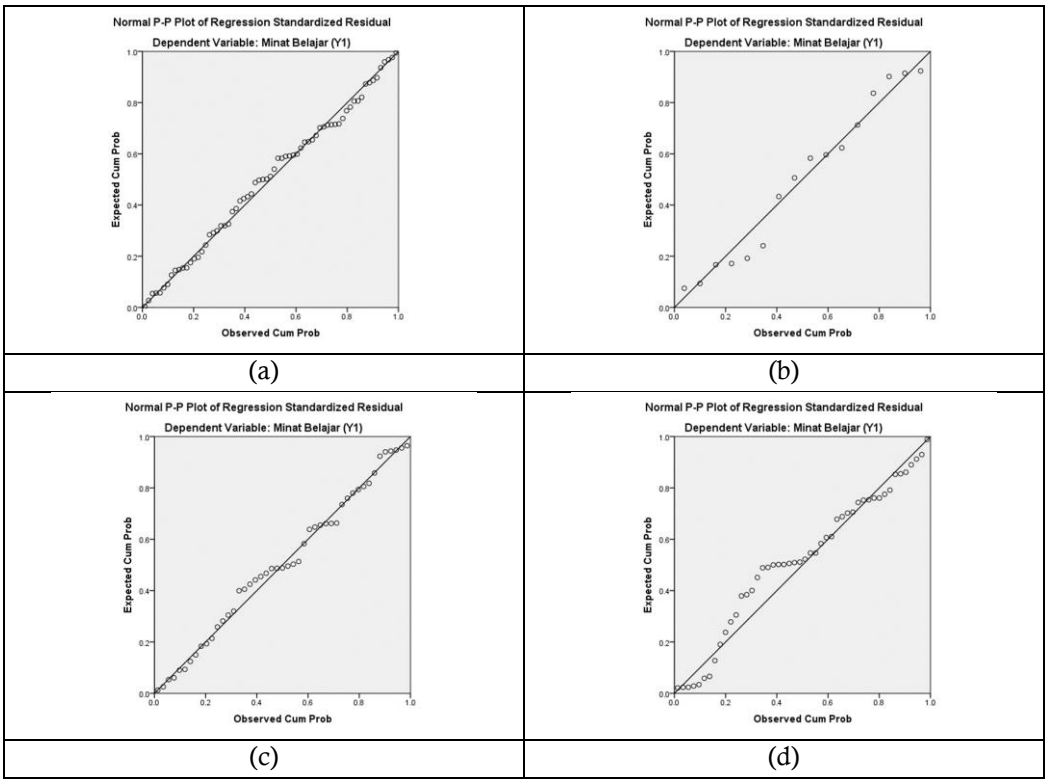

Figure 1 Normal Probability Plot*:* (a) teacher 1 creativity variable, (b) teacher 2 creativity variable, (c) teacher 3 creativity variable, (d) teacher 4 creativity variable

Correlation Test

The data with normal distribution were then tested for Pearson Product Moment correlation. Pearson correlation is able to show the correlation coefficient which will be useful in calculating the linear relationship between two variables. If the correlation is not equal to 0, it can be stated if there is no relationship. In addition, the correlation can also be seen through the significance of the Sig line. (2-tailed). Data is considered significant if Sig. (2-tailed) < 0.05 (Safitri, 2016).

Table 7 Correlation Test of Teacher Creativity and Interest in Learning

Category	Sig.		Correlation	Influence Percentage
	Score	Criterion		
Teacher 1	0,013	Significant	0.303	9.2%
Teacher 2	0,807	Not Significant	0.066	0.4%
Teacher 3	0,005	Significant	0.405	16.4%
Teacher 4	0,000	Significant	0.533	28.5%

The data above shows that teachers 1, 3, and 4 have a significance value of <0.05, so based on the theory that has been discussed previously, it can be stated that there is a correlation between teacher creativity and student learning interest, with a correlation coefficient of 0.013, 0.005, and 0.000. But in teacher 2 the significance value is 0.807 > 0.05, so there is no correlation in this data. The next data shows the relationship between the variables of teacher creativity and student learning outcomes. The results received by teachers 1, 2, and 4 showed a significance number > 0.005, namely 0.920, 0.621 and 0.927, which means that there is no correlation between teacher creativity and student learning outcomes. However, teacher data 3 shows a significance with a value of 0.014 <0.05, so that in this data there is a correlation between teacher creativity and student learning outcomes.

Table 8 Correlation Test of Teacher Creativity and Learning Outcomes

Category	Sig.	
	Score	Criterion
Teacher 1	0.920	Not Significant
Teacher 2	0.621	Not Significant
Teacher 3	0.014	Significant
Teacher 4	0.927	Not Significant

Simple Linear Regression Analysis

Simple linear regression analysis on the teacher's creativity variable on learning interest shows the equation as attached in table 9.

Table 9 Regression Analysis of Teacher Creativity Variables on Learning Interest

Category	Sig.	Regression Equation
Teacher 1	0.013	Y = 46.411 + 0.646X
Teacher 2	0.807	Y = 80.821 + 0.197X
Teacher 3	0.005	Y = 42.910 + 0.675X
Teacher 4	0.000	Y = 39.990 + 0.812X

The regression equation for teacher 1 has a constant with a value of 46,411, which means that if the teacher's creativity variable is 0, then the learning interest variable is 46.411. The coefficient of 0.646 in the teacher's regression equation 1, and a significance of 0.013 <0.05, states that there is a significant influence between teacher creativity on students' interest in learning. The coefficient value of 0.646 means that if the creativity of the teacher increases by 1%, the student's interest in learning will increase by 64.6%.

The constant in the teacher regression equation 2 of 80.821 means that if the teacher's creativity variable is 0, then the variable of interest in learning is 80.821. With a coefficient of 0.197 and a significance of 0.807 > 0.05, this data shows an insignificant effect, because for a 1% increase in teacher creativity, students' interest in learning only increased by 19.7%.

The teacher regression equation 3 shows a significant effect between teacher creativity and interest in learning, with a data significance of 0.005 <0.05. It is proven by the large constant of 42,910, and the coefficient of 0.675, which means that if the value of the teacher's creativity variable is 0, the student's interest in learning is worth 42,910. Then for every 1% increase in teacher creativity, student interest in learning will increase by 67.5%.

The last regression equation for teachers is 4, the effect is quite significant with a significance value of 0.000 <0.05. The constant of 39.990 in other words is a large variable of interest in learning if the value of the teacher's creativity variable is 0. Then, the coefficient of 0.812 indicates an increase in student interest in learning as much as 81.2% if the creativity of the teacher has increased by 1%.

Table 10 Regression Analysis of Teacher Creativity Variables on Learning Outcomes

Category	Sig.	Regression Equation
Teacher 1	0.920	Y = 2.552 – 0.001X
Teacher 2	0.621	Y = 2.542 – 0.010X
Teacher 3	0.014	Y = 0.474 + 0.028X
Teacher 4	0.927	Y = 1.747 + 0.001X

Table 10 shows that there is no significant effect between teacher creativity variables 1, 2, and 4 on student learning outcomes of questionnaire respondents. Reinforced by large constants that represent the value of the variable learning outcomes of 2,552, 2,542, and 1,747 for teacher creativity of 0. The regression equation coefficients for teachers 1 and 2 show a decrease of 0.1% and 1% in student learning outcomes if the teacher's creativity increased by 1%. Then from the coefficient of the teacher's regression equation 4, it is known that there is an increase of 0.1% for the addition of 1% of the teacher's creativity variable. While in the teacher regression equation 3, although the significance value shows an influence between the two variables, the coefficient value which is not too large is 2.8%, it means that for every 1% increase in the teacher creativity variable, student learning outcomes will increase by 2.8%.

The Influence of Teacher Creativity on Learning Interest

The data on the frequency distribution of teachers' creativity in using the LMS shows a relatively high level of creativity of 4 Biology subject teachers, where 61.2% of teacher 1 students and 50% of teacher 2 students give a high category, then 49.1% and 62.5% students teachers 3 and 4 stated that their teachers had a very high level of creativity in using LMS. Not much different from the results of the frequency distribution of students' interest in learning in Biology subjects during the pandemic, which showed that more than 60% of the four teacher respondents had a satisfactory interest in learning, with a moderate to high range.

In connection with the description of the variables above, the results of a simple linear regression analysis of the teacher's creativity variable on students' interest in learning, teachers 1, 3 and 4 show a data significance of < 0.005, which proves that teacher creativity has a significant influence on student learning outcomes. This result is also reinforced by the coefficients of each category in sequence, namely: 0.646, 0.675, and 0.812, which means that 1% of the increase in teacher creativity will have an impact on student interest in learning which will also increase by 64.6%, 67.5 %, and 81.2%.

As the definition of teacher creativity and interest in learning written in the previous chapter, then linked to the results of the study, it was found that the teacher's ability to utilize all the features in the LMS or google classroom optimally and efficiently will have a very significant influence on students' interest in learning. , where students will feel more interested in participating in teaching and learning activities, because students can get teaching materials in the form of links to articles, journals, and videos related to the topic being discussed, as well as asking questions in the comments column with the teacher and classmates. can be proven by the active participation of students during the learning process.

The results of this study are supported by several previous studies such as Noviantari (2017), teacher creativity on students' interest in learning has significant results. Through the data description, it is known that teachers in research schools using teaching aids are actually related to the topic being taught, and this activity has a positive impact on students' interest in learning, because students find it easier to understand with the help of teaching aids.

The percentage of teacher creativity in this study shows that teachers, based on the indicators used, are in a relatively high category, which comes from three categories of statements. As in the creative attitudes indicator, it contains statement items related to the teacher's skills in utilizing the google classroom feature to share links to teaching materials. , learning resources in the form of videos, creating

discussion forums, etc. The use of features by teachers in Google Classroom according to Fatimah & Santiana (2017), such as sharing teaching materials, learning resources, supervising student activities, etc. believed to be able to produce a more meaningful learning process, so that students are interested in participating in class. DeCoito & Richardson (2018), in their research also reveals that the use of technology in the learning process must be balanced with the knowledge and skills of teachers regarding technology and the learning objectives to be achieved.

The Effect of Teacher Creativity on Learning Outcomes

Although the results of a simple linear regression analysis on the creativity variables in teachers 1, 3, and 4 on students' interest in learning show significant results and influence relationships, the regression analysis on interest in learning shows the opposite result. The calculated data shows that the teacher 1, 2, and 4 student learning outcomes are not affected by the teacher's creativity in using the LMS. With a significance number > 0.005 and a coefficient of -0.001 and -0.010 for teachers 1 and 2, which means a decrease of 0.1% and 1% of learning outcomes if teacher creativity increases by 1%. The coefficient on the teacher regression equation 4 also only shows an increase of 0.1% over the 1% increase in teacher creativity. Although the previous 3 data did not prove a significant effect between the teacher creativity variable and student learning outcomes, the teacher regression equation 3 had a significance value of 0.014 < 0.05, and a coefficient of 0.028, and still showed a relatively small effect of 2.8%.

Based on the description of the student learning outcomes of respondents as many as 178 and the overall students of class XI IPA SMAN 9 Bandar Lampung, it was concluded that student learning outcomes in Biology subjects as measured by the Mid-semester Odd Semester Assessment scores, were at a relatively low level, where > 50% student learning outcomes are in the category of less to very less. This breaks the author's hypothesis in the previous chapter, regarding teacher creativity affecting student learning outcomes.

The use of technology is associated with the creativity of teachers in using the features available in google classroom (assignment, grading, announcement pages, originality reports, learning archives, and mobile applications) referring to the opinion of Yureva et al. (2020), that technology in online learning only serves as a medium to regulate the learning process, not to support students to be able to study independently at home and get satisfactory learning outcomes. In addition, there are also several other factors that contribute to the impact on student learning outcomes, as the authors have stated in the theoretical basis, if not only teachers play a role in student learning outcomes, but also the family environment that facilitates children with learning tools and needs. , a supportive community environment for student learning activities, for example by not holding parties during school hours, besides that the student school environment also reflects the quality of the students. Because a conducive environment for students to carry out learning activities, especially during the distance learning period like today, will have a positive impact on student learning outcomes. Conversely, if the student environment does not support students to be able to learn safely and comfortably both physically and psychologically, the student learning outcomes will be unsatisfactory (Muslih, 2014).

Another factor that has the potential to be a barrier to student learning activities during distance learning comes from the devices or gadgets that students use for online learning. Notification messages from social media or games that appear on the device screen are very difficult to ignore, so students are often ignored and spend hours surfing the virtual world looking for entertainment until learning time is drained and in the end learning outcomes have decreased (CNN, 2020).

CONCLUSION

Based on the analysis of the results of research and discussion, it can be concluded that teacher creativity in using LMS affects student learning interest, but the results of teacher creativity data on student learning outcomes indicate that there is no influencing relationship between the dependent and independent variables, so it is stated that teacher creativity does not affect the results. student learning. The creativity or skill of the teacher in utilizing several features in Google Classroom is able to make students interested, because the teaching materials are varied, besides that students are given a place to discuss with the teacher and other classmates. Even so, it turns out that the creativity of teachers has not been able to give a significant influence on student learning outcomes. And on the other hand, student learning outcomes can also be influenced by other internal and external factors beyond the ability or creativity of the teacher, which is a great potential obstacle to student learning activities, which then leads to a decrease in learning outcomes.

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