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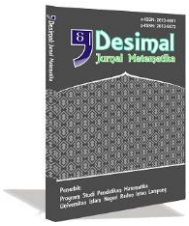

Mathematics learning independence: The relationship of youtube as a media for mathematics learning

Jihan Fitri Isnaini*, Ervin Azhar

Universitas Muhammadiyah Prof. Dr. Hamka, Indonesia

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*Correspondence: E-mail: jihanfitriisnaini@gmail.com

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ABSTRACT

This research aims to determine whether there is a relationship between YouTube *social media and student learning independence. This research was conducted through a quantitative approach using ex-post facto research methods. The sampling technique used was cluster random sampling. The validity of the instrument was tested using expert judgment and empirical test using Product Moment/Pearson. The instrument was tested using the Cronbach Alpha formula. The data obtained w*ere analyzed *using descriptive statistics, prerequisite test analysis, and correlation analysis. Based on theoretical studies and calculations of the two variables, it shows that there is a positive relationship between* YouTube *social media on student learning independence and the magnitude of the* YouTube *social media relationship on student learning independence*.

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INTRODUCTION

Education has a very important role for the progress of all human life, it can create quality, integrity and intellectual human beings so as to avoid ignorance and lack of knowledge. In the educational process there are factors that influence including various inputs, such as teaching materials, methodologies, school facilities, administrative support, infrastructure and other resources as well as creating a conducive atmosphere (L. Sari, 2020). In addition, to create an active learning atmosphere, interesting learning media are needed, one of which is by utilizing technology. The use of mobile devices in Indonesia reaches 29 million people. Because the ability to use information technology has become a lifestyle for most people, especially young people (Setiadi et al., 2019). It makes education in the modernization era not only prioritizes goals in achieving learning, but also prioritizes technology implementation (Muhali, 2018). It is expected that education can develop well and be able to improve the quality of knowledge, abilities and skills in using technology.

Activities in education are in the form of learning activities (B. Sari & Rahayu, 2020) the goal is to convey knowledge, skills and behavior from one

generation to the next generation to achieve certain goals. Learning is carried out in the planning, implementation, and evaluation stages by educators and then applied through classical meetings supported by appropriate media, tools, and materials. The implementation of learning in Indonesia is currently undergoing changes due to the COVID-19 pandemic. In connection with this situation Mendikbud (2020) issued Circular Letter number 4 regarding the prevention of the spread of COVID-19 in which all learning activities are carried out online.

Online learning is the right solution to deal with the current situation because virtual learning or online learning is not limited by space and time. The interaction between teachers and students can take place anytime and anywhere (Syarifudin, 2020). The purpose of online learning is to provide quality learning services in a massive and open network to reach more and wider learning enthusiasts (Handarini & Wulandari, 2020). According to Yunitasari & Hanifah (2020) the benefits of online learning are to improve communication and interaction between teachers and students efficiently, to make it easier for teachers to make material with different variations of methods and in choosing learning media. In online learning, teachers and students use media such as laptops, computers and mobile phones equipped with various applications to convey learning materials and assignments. But according to Alami (2020) in choosing learning media, it is a challenge for teachers to master technology. In addition, according to Adhe (2018) in choosing the media to determine the right teaching material media is based on the characteristics of students. Online learning can use several sites such as Instagram, WhatsApp, Line, Facebook, Twitter, Zoom Cloud Meeting, Google Meet and YouTube.

YouTube is a site that is broadcast online so that its display is more attractive. YouTube is the most strategic and popular media that provides video loaded services (audio visual) to disseminate information to its users. Everyone can publish various kinds of videos on the YouTube site. According to Baihaqi et al. (2020) one of the negative effects of YouTube social media is that there are several channels that should be accompanied by parents. But according to Faiqah et al. (2016) the benefits of using YouTube social media are: YouTube provides a service that is easy to use and accessible to all people, users can watch videos directly and widely with the streaming feature on the YouTube service, users can provide feedback on the video comment column that has been uploaded on the YouTube service, users can access various kinds of interesting videos according to their needs as entertainment. In learning mathematics, the material taught is not only in the form of knowledge, but also there is an explanation of each step in mathematics problem solving which if written in the form of text will consume many pages (Suwarno, 2017). But by using video, it can be summed up in just a few seconds of video. In addition, according to Astriyani & Fajriani (2020) YouTube is very useful for students when learning is difficult so that students can be better at understanding the learning material, especially in abstract science lessons. According to Purnama & Afriansyah (2016) mathematics is an abstract subject.

Mathematics has an important role to improve reasoning. According to Arta et al. (2020) mathematics is a science that includes abstract concepts and is arranged systematically to improve reasoning power. Mathematics is one of the compulsory subjects in learning at school. According to Jamal (2014) learning mathematics can improve abilities, concentration power, think rationally and making the right decisions. Meanwhile,

according to Anisa & Ambarwati (2020) The failure trigger in learning mathematics is not knowing mathematical concepts. According to Suwarno (2017) in mathematics, it should uses pictures in conveying the material. Teachers can use several media, including audio (sound), visual (pictures), audio-visual (pictures and sound) media to make it easier to solve mathematics problem solving and train students' independence.

Learning independence is one of the important factors in learning. According to Aisah (2019) learning independence is the determination of goals based on readiness to achieve goals and learning strategies on their own initiative, learning independence can hone students' memory of a problem because students can learn according to their own awareness of their own volition so that they are able to solve problems independently. According to Mulyadi & Syahid (2020) the benefits of learning independence are honing various intelligence factors, improving concentration, analyzing and skills, and forming a sense of responsibility. Low learning independence cannot prove high learning goals (Sulistyani Dianna,et. 2020). According to Malenda et al., (2018) there are 5 indicators including initiative, confidence, discipline, responsibility and motivation. But according to Candra et al. (2019) which states that the indicators of student learning independence consist of not depending on others, being confident, having disciplined behavior, having their own initiative, having a sense of responsibility and self-control.

Based on the problems above, further research is needed that aims to determine the relationship of YouTube social media to the learning independence of students according to the situation and conditions when the research takes place because external factors also influence it.

METHOD

In this research, the approach used is a quantitative approach. This research uses two variables, YouTube social media as the independent variable (free) and learning independence as the dependent variable (bound). The thinking framework can be developed based on the theoretical basis and the literature review listed above, so that YouTube social media can be used for learning and is able to improve students' learning independence.

In this research, the approach used is a quantitative approach. This research uses ex post facto type. This happens due to observing the natural symptoms so that no manipulation occurs. The sampling technique used is the Cluster Random Sampling technique. Cluster Random Sampling is a random sampling of existing groups or populations. This is because the sample taken is very wide. This technique is an easy technique to implement, so that there are samples that are in accordance with the existing research objectives. Researchers used samples taken from the population so that the sample used in this research came from a population of one class, namely class VIII with a total of 30 students. In this case, the sample size is not absolute or in accordance with a provision. The data collection technique used the developed instrument, namely a YouTube social media questionnaire and a student learning independence questionnaire. The questionnaire in this research used a Likert 4 scale consisting of (4) strongly agree, (3) agree, (2) disagree, (1) strongly disagree with the statements described from the indicators. The instruments tested were 20 questions on YouTube social media questionnaires and 35 questions on learning independence questionnaires filled out by students through Google Forms because learning was done online. Both instruments were tested using the validity test with the Product Moment/Pearson correlation

formula and the reliability test using the Cronbach's Alpha formula.

Data analysis technique is an effort to process data. It happens with the aim that researchers know and understand the characteristics of the data so that it can be used to answer problems related to this research. This research uses descriptive statistics with the research results present the data in accordance with what has been obtained in the research. In the description, the data will be presented in the form of mean (M), median (Me), mode (Mo), standard deviation (SD) and frequency distribution, and histogram of each variable. The following table describes the data obtained:

Table1. Analysis of Descriptive Statistics

Description	Variable (X)	Variable (Y)
N	30	30
Mean	46.26	95.96
Median	44	95
Modus	42	83
Variance	76.82	103.689
Standard Deviation	8.76	10.18

Researchers used Microsoft Office Excel 2016 to process the data.

RESULTS AND DISCUSSION

Research data was obtained using a questionnaire or questionnaire instrument. YouTube social media questionnaire was given to students to measure the effect of YouTube social media on students in learning, especially in mathematics. While the student learning independence questionnaire was given to students to measure the learning independence of students after getting learning materials using YouTube social media. Both instruments were tested to determine the validity and stability of the instrument. An instrument is proven valid if the data on each variable is examined properly. The validity test carried out by the researcher used 2 tests, namely expert judgment which was carried out to consult several validators using a validation sheet that had been prepared and empirical tests to test statements using the Product Moment/Pearson correlation formula with $N = 30$ and a significance level of $\alpha = 0.05$. Based on these calculations, the price of $r_{table} = 0.361$ with a correlation index between 0.153–0.679, 17 valid statements and 3 invalid statements for the YouTube social media questionnaire. Meanwhile, the learning independence questionnaire obtained 32 valid statements and 3 invalid statements with a correlation index between 0.232–0.730. Reliability test is used to determine the stability and consistency of data. The calculation results of the reliability test obtained 0.837 on the YouTube social media instrument and 0.934 on the learning independence instrument. Thus, the coefficients of the two instruments are included in the very high category.

After testing the analysis requirements, the classical assumptions were tested, namely the normality test and the data linearity test. The normality test is used to determine the data distribution in the sample studied from a population that is not yet known whether it is normally distributed or not. Provisions that the data comes from a normally distributed population if it meets the criteria of $L_0 < L_{table}$. This research uses the Lilliefors formula with a significance level ($\alpha = 0.05$) and the results are as follows:

Table 2. Instrument Normality Test Results

Var	α	$L_{calculate}$	L_{table}	Function
X	0.05	0.100	0.161	Distribute
Y		0.124		Normal

The normality test results obtained $L_0 = 0.100$ on variables (X) and $L_0 = 0.124$ on the variable (Y) thus $L_0 < L_{table}$. So, H_0 accepted and it can be concluded that the data is normally distributed.

While the data linearity test used is simple linear regression based on the functional relationship between the independent variable (YouTube social media) and the dependent variable

(student learning independence in mathematics). The equation used is $\hat{Y} = a + bX$. The proposed hypothesis is as follows:

$H_0: \hat{Y} = a + bX$ (Linear regression model)

$H_0: \hat{Y} = a + bX$ (Non-linear regression model)

The constant value (a) is 85.51 and the direction coefficient (b) is 0.22. So, the regression equation is as follows:

$$\hat{Y} = 85.51 + 0.22X$$

To determine the linearity of the regression, analysis of variance (ANOVA) was used. With the test criteria if $F_{tc} < F_{table}$, then the data of the variable X is linear to Y, and vice versa if $F_{tc} \geq F_{table}$, then the data of the variable X is not linear to Y.

Degrees of freedom mismatch $(dk_{tc}) = k - 2 = 17$, and degrees of freedom for the error $dk_{kk} = n - k = 11$. The following are the results of the regression linearity test, which are presented in the following table:

Table 3. Regression Linearity Test Results

Source of Diversity	DB	JK	RK	F_{tc}
Mismatch	17	1157.52	68.08	0.43
Error	11	1735.76	157.79	

The results obtained from the calculation of the analysis of the variance linearity regression $F_{tc} = 0.43$ and $F_{table} = 2.69$ therefore $F_{tc} < F_{table}$ at a significance level of 0.05. So, H_0 is accepted and it can be concluded that the data of the variable X is linear to the variable Y. Then, a regression significance test was carried out to determine whether the regression equation obtained was significant or not with a significant level $(\alpha = 0.05)$. The hypothesis made is:

$H_0: \beta = 0$: (There is no positive relationship between YouTube social media and students' learning independence)

$H_a: \beta \neq 0$: (There is a positive relationship between YouTube social media and students' learning independence)

To determine the significance of the regression model, the t-test was used with the test criteria H_0 is accepted if $-t_{table} \leq t_{calculate} \leq t_{table}$ then the regression model is significant, the formula used is:

$$t_{calculate} = r\sqrt{\frac{n-2}{1-r^2}}$$

The calculation of the significance variance of the regression is obtained $t_{calculate} = 5.106$, therefore $-t_{table} \leq t_{calculate} \leq t_{table}$ at a significance level of 0.05. So, H_0 is accepted, it can be concluded that the significance of the regression test is significant.

The lack of learning independence of students can be influenced by many factors such as lack of material provision. Through the reviewed theories that learning media assisted by YouTube social media can affect the independence of students in understanding the material, especially in mathematics subjects. The level of independence in learning mathematics is inseparable from the entire learning process. The behavior of a student who is responsible, confident, disciplined and initiative in learning can prove high learning independence. Meanwhile, students who have low learning independence tend to feel bored quickly, and give up easily during the learning process.

The research conducted by Marselina (2019) shows that there is an influence of YouTube social media on the learning independence of students. Likewise with the research conducted by Jumanto & Prihatsari (2018) shows that learning with the YouTube video-based peer tutor method has different variations. It proves that YouTube social media has a relationship with learning independence. Then what distinguishes this research from previous researches is that there are differences in external factors, one of which is the use of learning methods.

CONCLUSIONS AND SUGGESTIONS

The calculation result is obtained with the rejection result of H_0 which proves that there is a relationship between YouTube social media and students' learning independence in mathematics but it is in the good category. It can be proven by the magnitude of the contribution of variable *X* to variable *Y* of 48.1%. Thus, there are 51.9% of other factors that can affect the learning independence of students.

Based on data analysis and hypothesis test that have been carried out by researchers, it can be concluded that (1) there is a positive and significant relationship between YouTube social media and students' learning independence. (2) YouTube social media has a relationship with students' learning independence and with one of the factors that influence students' learning independence, especially in mathematics.

According to the results of the research that has been carried out, there are several suggestions, namely students are expected to understand the functions of YouTube social media for learning activities and further research can use learning resources other than YouTube social media to improve and find out other factors that affect students' learning independence.

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