

Analysis of Students' Learning Motivation in Calculus on the Usage of Learning Video Media during the Covid-19 Pandemic

Sumargiyani¹, Ardi Dwi Susandi², Nur Robiah Nofikusumawati Peni³

¹Mathematics Education, Ahmad Dahlan University Yogyakarta

²Nahdlatul Ulama University of Cirebon

³Master Program of Mathematics Education, Ahmad Dahlan University Yogyakarta

Email: sumargiyani@pmat.uad.ac.id

Abstract

The Covid-19 pandemic has changed the process of teaching-learning activities from offline to online. Implementing this activity causes a lack of motivation and self-confidence for undergraduate students. This study describes undergraduate students' learning motivation for using video media in integral calculus lectures for integral application materials to calculate the shape area during the Covid-19 pandemic. This research is quantitative descriptive research. The research participants were 23 undergraduate students from Ahmad Dahlan University in mathematics education. Data was collected by distributing questionnaires via Google Form consisting of 32 statements with five alternative answer choices and eight questions about learning motivation when utilizing learning video media. The analytical technique used was quantitative descriptive analysis. The results show that learning video media effectively motivates student learning in integral calculus during the Covid-19 pandemic with an average percentage result of 90.625% with very high criteria.

Keywords: analysis; learning motivation; shape area; learning video

INTRODUCTION

The COVID-19 pandemic had a significant impact on education worldwide (Erol & Danyal., 2020; Yanoski et al., 2021; Munir Rita, Afrinursalim, Hanif., 2021). As a result of the crisis, educators at all levels of education, from elementary to higher education, have had to adjust and move to distance learning quickly (Barry & Kanematsu, 2020; Ramdani et al., 2021; Markovi Krsti & Miloevi Radulovi, 2021). Students' motivation is one of the most significant aspects of learning (OBAN & GOKSU, 2022; Nazartseva et al., 2021). Students with high motivation will positively impact their interest to learn (Astuti et al., 2020). The lecturer must be able to motivate his students to succeed in studying. Various studies on motivation have been carried out. Research conducted by Elçi & Abubakar (2021) concluded that learning by giving assignments can encourage students to have high motivation. Furthermore, Yu & Jee (2021) found that using the ADDIE learning approach increased students' motivation. However, the study conducted was a motivating study on face-to-face learning prior to the pandemic period. According to the findings of the study, few scholars studied motivation in online learning during the covid-19 pandemic. Online learning is a type of learning in which students communicate with each other and get lecture materials via the internet (Bina, 2021). For the time being, online learning is thought to be the best strategy

for slowing the development of covid 19 on campus (Erol & Danyal, 2020). However, there are other issues with online learning. According to the preliminary research of Ahmad Dahlan University Yogyakarta students, a variety of issues commonly arise during online learning, including: (1) Lack of understanding of the material provided if the lecturer/teacher only provides a pdf file or reads material from a book without explaining it in detail, (2) Lack of focus on the material explained due to boredom or sleepiness, (3) The location of the house that is not served by the internet network, including the minimum student internet allowance; and, (4) The learning medium employed is monotonous and boring. As a result, it is necessary to develop lessons that can encourage students and help them overcome challenges they may have encountered during the COVID-19 pandemic.

Various ways that can be done to overcome the problems that occur in online learning faced by students are by providing suitable learning media so that student motivation increases (Rusdi, 2020). The learning media include using audio media, for example, voice notes sent in WhatsApp groups, e-learning from universities, zoom meetings, or google meetings, and using learning videos (Marković Krstić & Milošević Radulović, 2021). One of the learning media that is considered to increase student motivation during the COVID-19 pandemic is learning media using video (Trilani & Sudihartinih, 2022), which lecturers can use in the teaching-learning process. There have been numerous studies on the use of instructional videos. According to Danjou's (2020) research, learning videos during a pandemic can increase students' learning achievement. Furthermore, Khirwadkar et al. (2020) stated that using online learning videos as a strategy for studying mathematics during a pandemic is a viable option.

However, the focus of this study is solely on learning outcomes. There have not been many studies focused on student motivation that has been undertaken by researchers related to the use of learning video media during the COVID-19 epidemic. During the COVID-19 pandemic, motivation was the most crucial determinant of student performance in online learning (Hira & Anderson, 2021). As a result, researchers are interested in analyzing student motivation through the usage of learning videos in calculus classes during the COVID-19 pandemic.

RESEARCH METHOD

This study employs a quantitative descriptive method to conduct a quantitative study. Calculations from a questionnaire issued to class 2020 students attending integral calculus courses are used to describe the reaction to student learning motivation. By turning the received questionnaire data into quantitative data, the reaction of students' learning motivation to the use of a learning video media may be determined. The research participants were 23 students from the Faculty of Teacher Training and Education Ahmad Dahlan University in the Mathematics Education Study Program of 2020 class. Students are asked to learn integral calculus by watching a video that has been shared over a WhatsApp group. The video is divided into five segments, each lasting between 5 and 10 minutes.

The instrument in this study was a learning motivation questionnaire which was made based on indicators of learning motivation. There are eight indicators for learning motivation from (Uno, 2009), namely (1) concentration, (2) curiosity, (3) enthusiasm, (4) independence, (5) readiness, (6) enthusiasm or encouragement, (7)

never give up, and (8) confident. Each indication yielded four statements, resulting in a total of 32 assertions, 24 positive and eight negative. After students watch the learning videos, they fill out questionnaires using Google Forms. The questionnaire used a Likert scale, with five response options for each positive statement: strongly agree (5), agree (4), undecided (3), disagree (2), and strongly disagree (1). Meanwhile, the questionnaire had five response options for negative statements: strongly agree (1), agree (2), moderately agree (3), disagree (4), and strongly disagree (5)(Fitriyani et al., 2020). Eight open-ended questions were asked students' reasons or responses regarding eight indicators when learning using instructional video media.

The data analysis technique for the questionnaire is carried out by calculating the percentage of the score that has been obtained, using the following formula:

$$x = \frac{JP}{JSI} \times 100\%$$

Description:

x : percentage earned

JP : total score of respondents' answers

JSI : total score ideal

Furthermore, the results of the processed data are categorized by modifying the interval and the criteria of Firiyani, et al, (2020) shown in the following Table 1.

Table 1. Interpretation Criteria for Learning Motivation Percentage Score

No	Interval (%)	Criteria
1	$80 \leq x \leq 100$	Extremely High
2	$60 \leq x < 80$	High
3	$40 \leq x < 60$	Moderate
4	$20 \leq x < 40$	Low
5	$X < 20$	Extremely Low

While the data analysis technique for student replies is to group, summarize, and represent all inputs.

RESULTS AND DISCUSSION

Video is given to students as a learning media for shape areas materials. The shape area is calculated using definite integrals. There are five videos in total, including a theory, questions, and a discussion. Picture 1 and 2 show video presentations given to students.

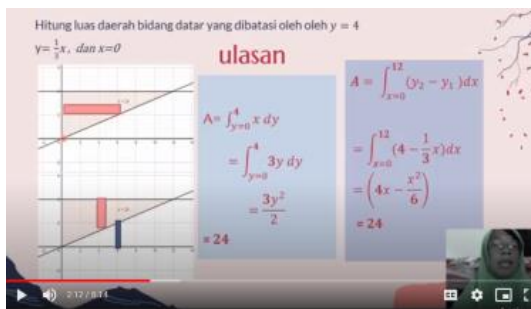


(1a)

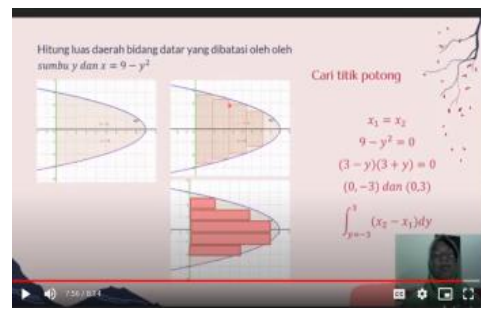


(1b)

Picture 1. Opening Views and Steps in Shape Area Calculation



(2a)



(2b)

Picture 2. Opening Test and Discussion in Shape Area Calculation

Students are requested to fill out a learning motivation questionnaire delivered via Google Form after learning how to use the videos. The following are the findings of the analysis of the eight motivation indicators collected from student questionnaires:

Concentration Indicator

Table 2 shows the percentage of students who responded positively to concentration indicators.

Table 2. Percentage of Student Responses to Concentration Indicators

Indicator : Concentration	Percentage	Criteria
Aspect 1 : Focus on studying	95%	Extremely High
Aspect 2 : Concentrated on the problem-solving steps	93%	Extremely High
Aspect 3 : Learning-centered	92%	Extremely High
Aspect 4 : Concentrate on completing tasks	93%	Extremely High
Average	93,25 %	Extremely High

The average percentage for the indicator of learning concentration is 93.25, which is extremely high. The findings show that students are focused on the subject and steps in completing integral calculus problems utilizing the provided learning video media.

Curiosity Indicator

Table 3 shows the percentage of students who responded positively to the curiosity indicator.

Table 3. Percentage of Student Responses to Curiosity Indicator

Indicator : Curiosity	Percentage	Criteria
Aspect 1 : Want to learn more	93 %	Extremely High
Aspect 2 : Want to know new things	91 %	Extremely High
Aspect 3 : Want to find new things	93 %	Extremely High
Aspect 4 : Want to know the new problem	82 %	Extremely High
Average	89,75 %	Extremely High

The average percentage of student curiosity is 89.75 percent, implying that students have a high level of curiosity, as well as a desire to learn new things about integral calculus through the use of the provided learning video media.

Indicator of Spirit

Table 4. Percentage of Student Responses to Indicator of Spirit

Indicator : Spirit	Percentage	Criteria
Aspect 1 : Active in learning	94 %	Extremely High
Aspect 2 : Train harder	90 %	Extremely High
Aspect 3 : Actively in practice question	89 %	Extremely High
Aspect 4 : Not lazy to study	94 %	Extremely High
Average	91,75 %	Extremely High

The average percentage of student enthusiasm for learning is 91.75 percent, indicating that students have a high level of excitement for learning by studying hard, practicing hard, and not being lazy in the learning process while using the provided learning video material.

Indicator of Independence

Table 5. Percentage of Student Responses to Indicator of Independence

Indicator : Independence	Percentage	Criteria
Aspect 1 : Don't rely on friends	87 %	Extremely High
Aspect 2 : Self-confidence	90 %	Extremely High
Aspect 3 : Discipline	98 %	Extremely High
Aspect 4 : Initiative	88 %	Extremely High
Average	90,75 %	Extremely High

Table 5 shows that students have very high self-confidence by not relying on friends, discipline, self-confidence, and take the initiative in learning integral calculus by using the provided learning video.

Readiness Indicator

Table 6. Percentage of Student Responses to Readiness Indicator

Indicator : Readiness	Percentage	Criteria
Aspect 1 : Not restless in studying	93 %	Extremely High
Aspect 2 : Not anxious in studying	89 %	Extremely High
Aspect 3 : Not nervous answering questions	88 %	Extremely High
Aspect 4 : No feel worried about answering the questions	92 %	Extremely High
Average	90,5 %	Extremely High

Table 6 shows that the average student learning readiness is 90.5 percent, which includes the extremely high category. When the learning process uses the provided learning video media, students demonstrate a high level of learning readiness by not feeling apprehensive and not being anxious in studying integral calculus.

Enthusiasm or Encouragement Indicator

Table 7. Percentage of Student Responses to Enthusiasm Indicator

Indicator : Enthusiasm	Percentage	Criteria
Aspect 1 : Study hard	89 %	Extremely High
Aspect 2 : Eager to learn	91 %	Extremely High
Aspect 3 : Not bored with new things	87 %	Extremely High
Aspect 4 : dissatisfied with the routine things	93 %	Extremely High
Average	90 %	Extremely High

Table 7 shows that the average student excitement is 90%, implying that students are very excited about learning integral calculus, diligent, persistent, and bored with routine tasks when using instructional video media.

Never Give Up Indicator

According to the calculations in Table 8 below, the average proportion of never giving up in student learning is 90.75 percent, implying that students never give up enthusiastically, passionately, or never give up in studying integral calculus utilizing the provided learning video.

Table 8. Percentage of Student Responses to Never Give Up Indicator

Indicator : Never Give Up	Percentage	Criteria
Aspect 1 : Do not give up	87 %	Extremely High
Aspect 2 : Full of enthusiasm	90 %	Extremely High
Aspect 3 : Passionate	98 %	Extremely High
Aspect 4 : Devoid of hope	88 %	Extremely High
Average	90,75 %	Extremely High

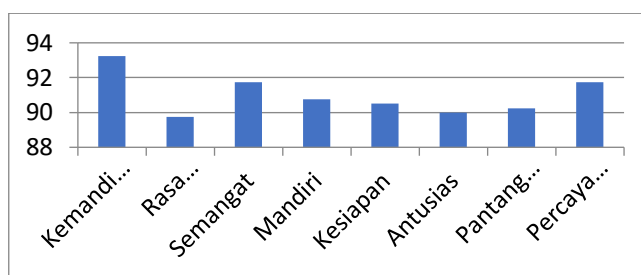
Self-confidence Indicator

Table 9. Percentage of Student Responses to Self-confidence Indicator

Indicator : Self-confidence	Percentage	Criteria
Aspect 1 : Confident in learning	90 %	Extremely High
Aspect 2 : Do not hesitate in studying	94 %	Extremely High
Aspect 3 : Confident in practice questions	89 %	Extremely High
Aspect 4 : Do not hesitate in practice questions	94 %	Extremely High
Average	91,75 %	Extremely High

Based on the findings, students have an average confidence of 91.75 percent in extremely high criteria, implying that they are confident and do not hesitate to learn integral calculus using the provided learning video.

When viewed through the eight indications of learning motivation, student learning motivation during the integral calculus learning process using learning video media may be summarized as shown in Picture 3.



Picture 3. Results of Analysis on Student Learning Motivation with the Use of Learning Video

Each indication of student learning motivation has extremely high standards, as shown in Picture 3. This demonstrates that the usage of video learning resources for the shape area was well received by the students. With very high criterion, the average students' learning motivation for using learning video is 90.625.

Students' learning motivation in learning integral calculus using learning videos is seen from eight indicators, namely: concentration, curiosity, spirit, independence, readiness, enthusiasm, never give up and self-confidence.

There are four indicators of concentration that can be used to determine if students are concentrating on learning integral calculus utilizing the distributed learning video media. Based on the results obtained, 14.1% strongly agree, and 80.4% agree, 2.1% undecided, 3.2% disagree, and 0% strongly disagree with the use of instructional video media. Students become concentrated on learning for the following reasons: (1) Because it can be played repeatedly, it is more focused and easier to understand. (2) Videos are explained slowly and logically so that they are easy to follow. In addition, the use of visual representations aids in depicting information in the classroom. (3) Learning videos employ simple language and clear explanations. (4) Topics are discussed in structured videos, and the material is presented in an easy-to-understand manner. (5) Videos display sketches of pictures so that people can not only hear but also see how the problem is described and discussed, and (6) The speaker delivers the material in a clear voice, with the aid of writing in the form of material points and pictures, as well as integral application in the form of instances of questions and solutions.

The curiosity indicator consists of four statements that determine if students are interested in learning integral calculus utilizing the shared learning video. Based on the results obtained, 8.7% strongly agree, and 79.3% agree, 2.2% doubtful, 6.5% disagree, and 0% disagree with the use of instructional video media. The reasons given include (1) Learning videos are presented through examples that make curiosity appear, to identify the correct and appropriate responses based on the examples of questions provided, and (2) By watching learning videos raise curiosity about examples that exist in everyday life that related to this topic (3) Learning videos provide explanations that provoke curiosity about calculus by giving some examples of work, (4) Learning videos assist and arouse interest in integral calculus topics.

Four statements of spirit indicators to see whether students are enthusiastic about learning integral calculus by using the learning video media shared. Based on the results obtained, 15.21% strongly agree, and 70.65% agree, 2.2% doubtful, 2.2%

disagree, and 0% disagree with the use of instructional video media. The following are the reasons were given: (1) The video is not too long and does not make it easy to become bored, which increases interest in learning, (2) The video gives a sequential order of completion, which is simple to grasp, (3) Videos create enthusiasm for learning because of curiosity to calculate the shape area with definite integrals, (4) Presenting the material and steps for solving problems is structured to make students enthusiastic in solving problems, (5) Videos provide various examples of questions that make students enthusiastic about learning integral calculus.

There are four indicators of independence to see whether students are independent in learning integral calculus by using the learning video media that have been distributed. Based on the results obtained, 13.0% strongly agree, and 70.7% agree, 2.2% doubtful, 2.2% disagree, and 0% disagree with the use of instructional video media. The reasons given include: (1) learning videos helps students understand the material better, so they are less reliant on friends. (2) the video provides many variations of sample questions and steps for solving them in a structured way to make students independent to work on practice questions, (3) the existence of learning videos makes students intrigued to independently learn to understand the material and try to solve the questions given.

There are four indicators of readiness to see if students are ready to learn integral calculus by using the learning video media distributed. Based on the results obtained, 8.7% strongly agree, and 77.2% agree, 2.2% doubtful, 1.1% less agree, and 0% disagree with the use of video learning media students are ready to learn. The reasons given include (1) The existence of video learning students will be better prepared to learn something because the basic explanation will be helped in the video, (2) Students know in advance what will be studied later, (3) help students to be ready to learn calculus, because the eye this course requires extra attention, (4) the material discussed in the learning video makes students more ready to learn calculus. According to Naidoo and Singh-Pillay (2021) by provide the online material through video, students were comfortable to access all the uploaded content, resources, and material, which support them to get ready for learn today's topic in the classroom.

By using the learning video media presented, there are four enthusiastic indicators to assess if students are excited about learning integral calculus. Based on the results obtained, 9.8% strongly agree, and 73.9% agree, 2.2% doubtful, 2.2% disagree, and 0% disagree with the use of video learning media students are ready to learn. The reasons given include (1) learning videos can increase confidence in doing questions (2) The explanations in the videos are straightforward and easy to follow, so students are motivated to learn integral calculus. (3) The material in the videos is explained in a light and easy-to-understand manner, so they are not bored and are eager to learn how to answer the questions, (4) learning videos make students enthusiastic in understanding the material and attempting the tasks. This result also in line with Trisnawati et.al (2021) shows that learning media have crucial role in teaching learning process and can prevent students from the boredom in learning.

There are four statements of never giving up indicators to see whether students never give up in learning integral calculus by using the learning video media that

have been shared. Based on the results obtained, 13.04 % strongly agree, and 70.1% agree, 2.2% doubtful, 2.2% less agree, and 0% disagree with the use of video learning media students are ready to learn. The reasons given include (1) Students are less likely to give up working on problems/learning integral calculus because of the video's simple examples and explanations, and (2) students never give up learning integral calculus because they want to keep trying and understanding it after seeing and explaining the content. (3) Students do not give up learning integral calculus because the subject has been explained in the video on how to perform the questions. Therefore students do not give up trying practice questions until they receive the correct answer.

There are four self-confidence indicators to see whether students are confident in learning integral calculus by using the learning video media shared. Based on the results obtained, 15.21% strongly agree, and 70.65% agree, 2.2% doubtful, 2.2% disagree, and 0% disagree with the use of video learning media students are ready to learn. The reasons given include (1) Students are confident because there are examples and easy-to-understand explanations in working on problems/learning integral calculus so that students grasp before the class. (2) The availability of learning videos allows students to understand calculus better. (3) Students have confidence in their ability to master integral calculus because the instructional video clearly explains the source material and problem-solving steps. The findings of this study show that using integral calculus learning video material for shape areas can help students learn more effectively. Students responded positively to the utilization of learning video material during the learning process. Thus, during the Covid-19 pandemic, the introduction of video media in the integral calculus learning process positively impacted and boosted student learning motivation.

CONCLUSION

The use of learning media in the form of learning videos can be used to increase student learning motivation in integral calculus courses. It can boost student motivation during the online learning session, which is very important in the Covid-19 pandemic. Suggestions for future research, it is necessary to look into deeply the effectiveness of learning video media in increasing students' interest, critical thinking, and creative thinking in integral calculus.

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