THE IMPLEMENTATION OF THE PROBLEM-BASED LEARNING WITH TIKTOK VIDEOS TO ENHANCE STUDENT LEARNING OUTCOMES AND ACTIVITIES

ARTIKEL

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Assalamualaikum Warahmatullahi Wabarakatuh.

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Penulis menyadari dalam penulisan proposal ini tidak akan selesai tanpa bantuan dari beberapa pihak. Oleh karena itu penulis menyampaikan ucapan terimakasih yang sebesar-besarnya kepada:

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The Implementation of the Problem-Based Learning With TikTok Videos to Enhance Student Learning Outcomes and Activities

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Abstract

A good learning process involves both teachers and students collaboratively. Teacher-centered learning often leads to passive students who tend not to experience engaging learning opportunities. A case study at SMAN 1 Teupah Barat Simeulue indicated that students' learning outcomes in the human digestive system topic were still suboptimal, and students' critical thinking in responding to real-life problems had not yet emerged. This study aims to analyze students' learning outcomes and activities through the implementation of a problem-based learning model assisted by TikTok short video media in the human digestive system topic. The research used a pre-experimental method with a one-group pretest-posttest design, while student activity was measured through observation. Data was collected using test questions and observation sheets. Data analysis was performed with SPSS Version 25 and descriptive statistics. The findings showed that students' learning outcomes on the human digestive system topic improved significantly, with a p-value of 0.000 < 0.05. Meanwhile, students' learning activities reached a final score of 66.77%, categorized as good. The application of a problem-based learning model integrated with TikTok video media on the human digestive system topic can enhance students' learning outcomes and activities.

INTRODUCTION

Education can be defined as a conscious and planned effort to prepare students in such a way that they can develop their skills that will later be useful for themselves, society, nation and state. The purpose of education is to prepare humans to solve life problems related to learning now or in the future (Walenta, 2022). Critical thinking skills are essential for students in the 21st century. These skills are important for making decisions and processing information related to issues students encounter in daily life (Aprina et al., 2024). However, students often struggle to think independently, develop self-confidence, and build social skills necessary for solving problems in their environment

SMAN 1 Teupah Barat Simeulue School is a school located in the middle of a residential area far from the city, where the school only has 294 students, the class used by the researcher as an experimental class is class XI MIA 2 with 21 students.This issue is also evident among Grade XI students at SMAN 1 Teupah Barat, Simeulue, who are not yet able to express their opinions independently. Students tend to remain passive, primarily listening and staying quiet during the learning process, which affects their comprehension of the material and limits optimal learning outcomes. Learning activities are activities undertaken to acquire knowledge, understanding, skills, including attitudes and values (Sherlyani et al., 2019)

Active learning provides a quick and enjoyable way to improve understanding of the material. It encourages students to learn problem-solving independently (Rahmi et al., 2018). Enjoyable learning fosters positive responses from students, leading to an increase in learning activities (Wardila et al., 2023). Observations at school also revealed that students are not yet able to express their thoughts openly, partly due to the lack of material presenting real-life problem examples suitable

for student discussion. Therefore, it is essential to identify an appropriate learning model to address this issue. Choosing the right model will positively impact the achievement of desired learning objectives (Chotimah & Fathurrohman, 2018).

The purpose of the problem-based learning model is to enable students to think critically, build teamwork, and develop social skills to solve real-life problems, foster learning skills, and motivate students (Zahrawati, 2020). Activities in the problem-based learning model give students opportunities to openly express their ideas and gain experiences related to the information they possess. These experiences are expected to encourage students to distinguish and integrate ideas on issues from everyday life (Hilda et al., 2023). Implementing the problem-based learning model helps students become creative, imaginative, reflective thinkers and hones their problem-solving skills for real-world situations (Shoimin, 2014).

The use of a learning model will not be effective if it is not supported by appropriate learning media (Puspita et al., 2018). A learning model is most successful when combined with suitable educational media. The human digestive system is an abstract topic that cannot be directly observed, thus requiring media to achieve the learning objectives (Kristiawati, 2023). This topic is closely related to everyday life (Sari et al., 2022). One of the most widely viewed social media platforms in Indonesia is TikTok, known for its short, interactive videos that make it easy for viewers to absorb information (Eriska, 2024). The majority of TikTok users are young people of school age (Anisa et al., 2022). Therefore, TikTok videos are an alternative medium that can be combined with the problem-based learning model. The material used in the study was material about the human digestive system, where during interviews with students they had difficulty in sequencing the parts of the digestive system organs, and where during the exam or mid-term exam they were still below the average of the KKM set by the school. TikTok offers a variety of potentials to improve student activity and learning outcomes. With interactive and engaging content, this application can be an effective tool to support the learning process, especially the human digestive system. TikTok allows the presentation of learning materials in a more interesting and easy-to-understand form, so that it can encourage students' interest and active participation (Pebrimireni & Fauziya, 2024)

The integration of problem-based learning and TikTok videos has the potential to stimulate students' interest, attention, and activities in the learning process. TikTok videos and the problem-based learning model provide an innovative approach to enhance students' activity and learning outcomes (Hilda et al., 2023). TikTok videos can be used in the problem-based learning model to visually present real-life problem examples, making it easier for students to understand and investigate them (Fauziah, 2017). This study aims to analyze the improvement in student learning outcomes and activities through the application of the problem-based learning model supported by TikTok video media on the topic of the human digestive system.

RESEARCH METHODS

1. Time and Place of Research

This research was conducted during the odd semester of the 2023/2024 academic year at SMAN 1 Teupah Barat, Simeulue. The research schedule was adjusted to align with the biology subject timetable, starting in August 2024 in Grade XI at SMAN 1 Teupah Barat, Simeulue.

2. Types of research

This research employs a combination of quantitative and descriptive qualitative approaches. The quantitative approach is used to analyze the improvement in students' learning outcomes through the application of the problem-based learning model and TikTok as a medium in the human digestive system topic. Meanwhile, the qualitative approach is utilized to observe various aspects of students' learning activities when implementing the problem-based learning model and TikTok as a medium in the human digestive system topic.

3. Research Methods

The research method used in this study is the pre-experimental design method. This study was conducted with a single group, specifically the experimental group, which received

instruction using the problem-based learning model supported by TikTok media. The design model applied was the one-group pretest-posttest design.

4. Population and Sample

The research involved Grade XI MIA students of SMAN 1 Teupah Barat. The Grade XI MIA students at SMAN 1 Teupah Barat consist of 4 classes with a total of 95 students. The sample class was selected using purposive sampling, and the chosen class was XI MIA 2, comprising 21 students. This class was selected based on interviews with teachers, considering the class's lower learning outcomes and student activity levels.

5. Research Procedure

The research procedure began with interviews with teachers and direct observation at the school to assess the students' readiness for conducting the research at SMAN 1 Teupah Barat, Simeulue. Subsequently, the researcher prepared the learning tools and media to be used in the study. The research data were obtained through tests, direct classroom observation, and comprehensive documentation. This study also involved school teachers as observers.

6. Data Collection

The data collection techniques used in this study were tests and observations.

1. Test

   The test technique involved the use of pretests and posttests. The tests were conducted twice: before (pretest) and after (posttest) the students were given treatment using the problem-based learning model with TikTok videos as the media. This was aimed at assessing the students' learning outcomes both before and after the application of the problem-based learning model with TikTok video media. The test in this study was designed to determine or measure students' learning outcomes. It took the form of a formative multiple-choice test administered at predetermined times, namely before learning (pretest) and after learning (posttest) (Arifin, 2014).

2. Observation

   Observation is a data collection technique conducted through systematic, logical, objective, and rational observation and recording of various phenomena, either in real situations or artificial ones, to achieve specific objectives.

7. Data Analysis

Data analysis techniques included prerequisite tests and hypothesis testing. The prerequisite tests consisted of the N-gain test, followed by normality and homogeneity tests. After completing the prerequisite tests, a t-test or mean difference test was conducted as a reference for hypothesis testing. Data analysis is a crucial step in research, as it is used to draw conclusions from the findings. The data collected from the test results in the experimental class was analyzed for mean differences to test the significance of these differences using the t-test (Independent Sample T-Test) with SPSS 25. Student activity data collected from observation sheets was then analyzed using a percentage formula. The classification criteria for N-Gain obtained after analysis are presented in Table 1, while the student activity observation data was interpreted according to Table 2.

Tabel 1. N-Gain Classification Criteria

N-Gain	**Criteria**
$g \leq 0,30$	Low
$0,30 \leq g \leq 0,70$	Medium
$g \geq 0,70$	High

(Sugiono, 2017)

The data obtained from the student observation sheets used a Likert scale with the following scoring system for responses.

Tabel 2. Interpretation of Student Activities

Percentage Interval	Category
0% - 20%	Not Good
51% - 40%	Poor
41% - 60 %	Fair
61% - 80 %	Good
81% - 100%	Very Good

(Ridwan & Sunarto, 2017)

RESULTS AND DISCUSSION

Student Learning Outcomes

Based on the research findings, the implementation of the problem-based learning model assisted by TikTok videos can improve student learning outcomes. The results were obtained using test questions through pretests and posttests. This assessment of learning outcomes was conducted through several stages, yielding the following results.

Tabel 3. Pretest dan Posttest Student Learning Outcomes

	N	Min value	Max value	Average
Pretest	21	20	60	44,29
Posttest	21	55	85	75

Based on Table 3, the pretest results show an average score of 44.29, which is attributed to students not yet having a deep understanding of the human digestive system. Meanwhile, the posttest results indicate an average score of 75, reflecting an increase of 30.71 points. This improvement is due to students gaining a deeper understanding of the material presented by the teacher using the problem-based learning model and TikTok videos. The improvement in student learning outcomes is influenced by the teacher's skill in applying appropriate models and media (Ersa et al., 2023). In the teaching material on the human digestive system, a significant amount of content is presented, requiring additional learning media to enhance students' understanding and enable them to be more active during the learning process (Ridwan et al., 2024).

Tabel 4. Normality Test Results

		Shapiro-Wilk		
Student learning outcomes	class	*statistic*	df	Sig.
	Pretest	.937	21	.190

The data obtained from the normality test with α = 0.05 showed, after conducting the Shapiro-Wilk test as presented in Table 4, that the normality test results for student learning outcomes indicated a significant value of 0.190 for the pretest, which is greater than 0.05. Therefore, the research data are normally distributed. Subsequently, a homogeneity test was conducted, as shown in Table 5. The Shapiro-Wilk method is used for sample sizes less than 50, and this method is very effective for small samples (Ramadhani et al., 2021).

Tabel 5. Homogeneity Test Results

Student learning outcomes	Average value	*Levene Statidtic*	df1	df2	Sig.
		3.270	5	13	.039

In Table 5, the homogeneity test shows a significant value of 0.039, which is less than 0.05, indicating that the variances of the two data sets are not homogeneous. Therefore, since the normality test indicates a normal distribution and the homogeneity test indicates non-homogeneity, the next step

must be to use the independent samples t-test for unequal variances, also known as Welch's t-test, because the variances are not homogeneous, even though they are normally distributed. The purpose of the homogeneity test is basically to show whether two or more groups of sample data come from a population that has the same variance or not (Hajaroh & Raehanah., 2021).

Tabel 6. T Test Results

Independen Samples Test

		Levene's Test for Equality of Variances		*t-test for Equality of Means*						
		f	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	*95% Confidence Interval of the Difference*	
									Lower	Upper
Student learning outcomes	*Equal Variances assumed*	11.920	.001	10.126	40	,000	-30.714	3.033	-36.845	-24.584
	Equal Variances Non assumed			10.126	31.120	.000	-30.714	3.033	-36.845	-24.584

The results in Table 6 show a significance value (2-tailed) of 0.000, where the hypothesis testing criteria indicate that 0.000 < 0.05, leading to the rejection of H_0 and acceptance of H_1. Therefore, the problem-based learning model has a significant effect on the learning outcomes of students in Class XI MIA 2 at SMAN 1 Teupah Barat, Simeulue, indicating an improvement in students' learning outcomes on the topic of the human digestive system. The influence of the problem-based learning model is supported by high student activities, particularly in visual activities, where students watch and listen to the videos presented by the teacher, allowing them to focus more on the provided content.

The independent sample t-test is a statistical method used to compare the means of two unrelated or independent samples. This test is used when you have two sets of data taken from different populations, with no subjects shared between the two samples (Syafiriani et al., 2023). The independent t-test was conducted to compare the mean learning outcomes of students before and after the implementation of the problem-based learning model using TikTok video media. The results of the t-test show a significance value (2-tailed) of 0.000, which is much smaller than 0.05. This indicates a significant improvement in student learning outcomes after the application of the problem-based learning model. Thus, the null hypothesis stating that there is no improvement in learning outcomes can be rejected.

The findings indicate that the combination of the problem-based learning model and TikTok video media has a positive effect on improving students' learning outcomes. This model encourages students to actively engage in the learning process through problem-solving relevant to real-life situations, while TikTok video media provides an engaging and interactive way to deliver information. Instructional videos combine the power of visuals and text, making information easier to absorb (Afrida et al., 2017). In the problem-based learning model, students are required to be active in the learning process, honing their thinking skills in evaluating and assessing (Aini et al., 2023). Consequently, students gain not only theoretical knowledge but also critical thinking skills.

The problem-based learning model significantly influences the improvement of students' learning, particularly in developing critical thinking skills regarding the topic of the human digestive system at SMAN 1 Teupah Barat, Simeulue. This model enhances students' critical thinking abilities

and learning outcomes, allowing them to participate actively in the ongoing learning process rather than merely receiving information from the teacher. The model refers to real-world problems that students can directly experience and apply in their daily lives (Asrinintyas et al., 2018). The problem-based learning model, supported by video media, greatly assists teachers in presenting real-life issues related to the topic of the digestive system. The video media also illustrates concepts that require students to be more active in taking notes on the content presented. Students must listen carefully to understand what is conveyed through the video (Soimah et al., 2021). By using this video, students are expected to better understand the material presented through TikTok video media.

Results of student learning activities

Activity indicators observed during the implementation of the problem-based learning model and TikTok video media include listening activities, visual activities, writing activities, oral activities, motor activities, and mental activities. The observation of activities was conducted by an observer over three meetings. The results of the activities for each meeting can be seen in Figure 1.

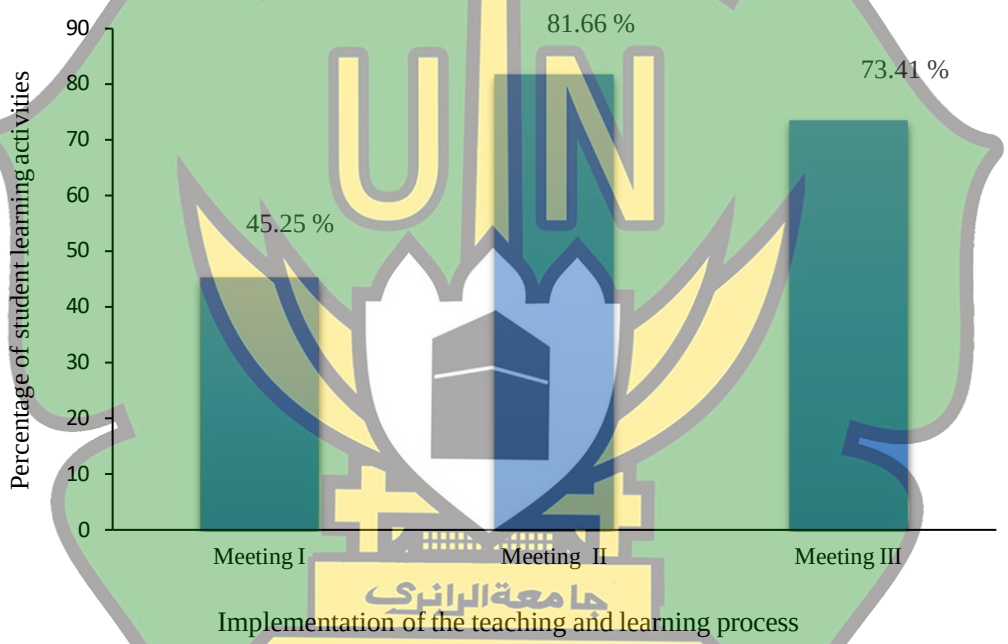

Figure 1. Percentage of Student Learning Activities with the Implementation of the PBL Model Supported by TikTok Videos on the Human Digestive System Material in Each Session

Based on Figure 1, there is a noticeable difference in the percentage of students' learning activity across the first, second, and third sessions. The percentage of learning activity with the application of the problem-based learning model and TikTok video media achieved the highest score in the first session, reaching 45.25%, categorized as fairly good. In the second session, the result increased to 81.66%, categorized as very good. However, in the third session, students' learning activity decreased to 73.41%, categorized as good. TikTok offers a variety of potentials to increase students' learning motivation. With interactive and engaging content, this application can be an effective tool to support the learning process (Pebrimireni & Fauziya, 2024).

During the first session, students were generally enthusiastic about the learning process, but challenges arose due to the inability to fully display the video because of a power outage, and students were not yet accustomed to the problem-based learning model. By the second session, students began to understand the steps of the problem-based learning model, and the video played without any issues. In the third session, students were eager to start the lesson, but during the learning process, the video presented by the teacher encountered audio issues. Additionally, the material delivered required

hands-on practice, such as food substance testing, which was less effective when presented solely through video.

Based on the average of student learning activity indicators at each session, varied results were obtained. The percentage of each student learning activity indicator with the implementation of problem-based learning and TikTok video media on the human digestive system can be seen in Figure 2.

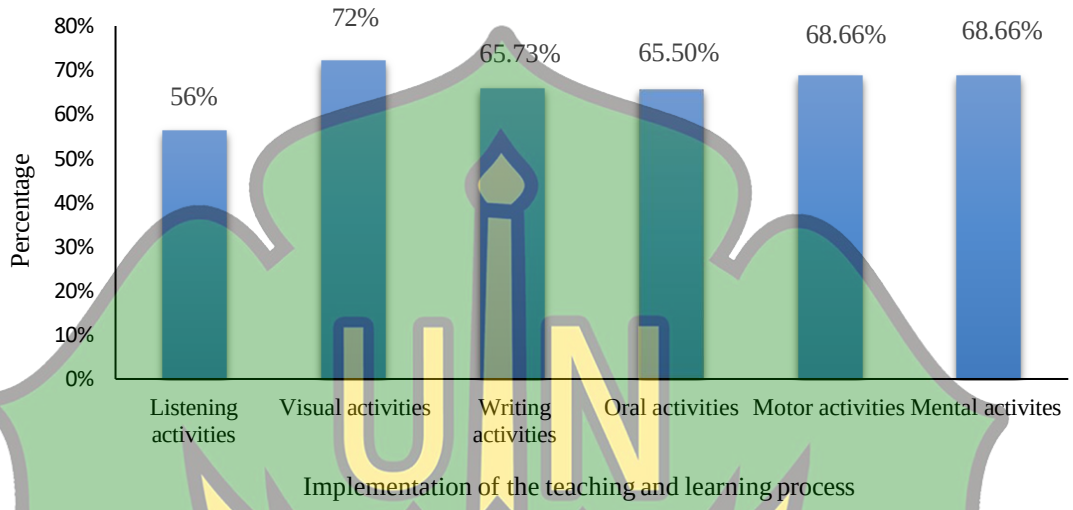

Figure 2. Percentage of Each Indicator of Student Learning Activity with the Application of PBL and TikTok Video Media on the Human Digestive System

Based on Figure 2, the highest indicator score is for visual activities, with a score of 72%, which falls into the "good" category, while the lowest score is for listening activities, with a score of 56%, categorized as "fairly good." The other indicators show relatively similar results, with writing activities and oral activities scoring 65.50% and 65.73%, respectively, both in the "good" category, while motor activities and mental activities scored 68.66%, also in the "good" category.

Visual activities have the highest score because, during the learning process, students were visibly enthusiastic when the teacher displayed TikTok videos, paying close attention to the material presented. The use of videos in the learning process can increase students' visual activities and positively impact their learning outcomes (Saraswati & Djazari, 2018). One of the most popular audiovisual social media applications today is TikTok, which is favored by teenagers for its entertaining content and its role in enhancing students' learning creativity (Kusuma, 2020).

Listening activities in this study were categorized as fairly good. During teacher explanations, not all students actively listened to what was conveyed. However, there was a noticeable difference when students listened to explanations from the video. This aligns with other studies, which suggest that students are more inclined to listen to explanations in video format compared to audio-only explanations. Student listening activities appeared less focused or moderately active when listening to the teacher's explanations or their peers' opinions (Baiduri, 2021).

The writing activity includes tasks such as writing and completing the worksheets (LKPD) provided by the teacher, which are completed through group collaboration. However, some students are observed not participating in writing, assuming that these tasks can be handled by other group members. Students only engage in writing activities when directed or instructed by the teacher. Teachers still find it challenging to foster students' willingness to write down what they need as notes or the correct answers from the ongoing discussion (Niraini et al., 2018).

The oral activity includes activities such as asking questions, expressing opinions, and receiving responses from other students during the learning process. Oral activities fall into the good

category; however, not all students are willing to express their opinions, and they still need motivation from the teacher to engage in discussions and question and answer sessions. Other studies have shown that some students still struggle to express their opinions; nevertheless, many students meet the criteria for oral activity achievement during the learning process (Rahmadani, 2017).

The motor activity indicator involves students finding answers through discussion and question and answer. However, the study still observed students who are not actively engaged in discussions and question and answerand instead choose to listen or remain silent. Therefore, the teacher needs to direct groups to involve all students in discussions. Other research has shown that teachers must guide students in conducting group discussions to find answers to the problems presented by the teacher (Ayuwati, 2017). Mental activities include students preparing themselves to confidently present in front of the class, as well as asking questions or expressing their opinions. Student mental activities involve several aspects, such as listening attentively to the teacher's explanation, discussing answers to given questions, collaborating with peers, asking about material they do not understand, responding to group discussion results, answering questions, and summarizing the learning material (Anggreiny et al., 2020).

CONCLUSION

The conclusion of this study indicates that the application of the problem-based learning model combined with TikTok video media significantly improves students' learning outcomes, with a significance level of 0.000 < 0.05. Additionally, students' learning activities reached a final score of 66.77%, categorized as good, in the human digestive system topic at SMAN 1 Teupah Barat Simeulue.

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