

TikTok Content-Based Learning Videos: Improving Learning Outcomes of Natural and Social Sciences (IPAS) Vocational High School

Rayi Arum Fatimah
Education Technology,
Postgraduate,
Universitas Negeri Medan, Medan,
West Sumatera,
Indonesia

Abdul Hamid, K.
Education Technology,
Postgraduate, Lecturer,
Universitas Negeri Medan, Medan,
West Sumatera,
Indonesia

Samsidar Tanjung
Education Technology,
Postgraduate, Lecturer,
Universitas Negeri Medan, Medan,
West Sumatera,
Indonesia

Abstract: The aims of this study were: (1) to determine the feasibility of TikTok content-based learning media and (2) to determine the effectiveness of TikTok content-based video learning media in improving learning outcomes. The type of research is research and development Research and Development (R&D) with the product development model Alessi and Trolip. The research was conducted at SMK Negeri 2 Kisaran in class X students. The subjects of this study were 64 people consisting of 32 students for the experimental class and 32 students for the control class. The research results show; (1) the feasibility of TikTok content-based video learning media for product validation is 90%, for material expert validation it is 85.26% with very feasible criteria, for media expert validation it is 98.62% with very feasible criteria. (2) The effectiveness of TikTok content-based video learning media is effective compared to conventional learning media. There is a significant difference between the learning outcomes of students who are taught using videos based on TikTok content and conventional learning media. Obtained $t_{count} = 2.18$ and $t_{table} = 1.66$ so that $t_{count} > t_{table}$ at a significant level $\alpha = 0.05$. So the learning outcomes of students who are taught with video learning media based on TikTok content have an effectiveness of 81.25% higher than conventional learning media with an effectiveness of 62.50%. The results of this study indicate that TikTok-based videos are effective in improving student learning outcomes.

Keywords: videos; tiktok content; instructional Media; natural and social sciences

1. INTRODUCTION

Learning media is an important element in the learning process. This is in Arsyad's opinion [1] which states that the two most important elements in the learning process are teaching methods and learning media. Learning media is a tool that conveys or delivers learning messages. One of the successes of learning is determined by the use of learning media made by the teacher. Learning media that are more interesting media dent interest in learning it will improve student learning outcomes.

The use of learning media can increase the efficiency and effectiveness of learning towards renewal. But currently, the teacher's efforts to increase creativity in supporting the learning process are still lacking. Teachers still use a lot of methods that are just the same, there is no innovation and creativity from the teacher himself. There are still many teachers who do not use interesting media so the learning process feels boring, especially in natural and social sciences (IPAS) lessons.

Science Science is a subject that aims to understand the surrounding environment, including natural and social phenomena. By studying natural science lessons, students can develop interest and curiosity so that students are triggered to study phenomena that exist around humans, understand the universe and its relation to human life and play an active role in maintaining, protecting, and preserving the natural environment, and managing natural resources. nature and the environment wisely. Science learning will work well if the teacher can use and develop learning media in the learning process.

The results of observations and initial studies conducted in science lessons on teachers and students at the Kisaran 2 Vocational High School (SMK) show that the current science learning process is still very monotonous. The learning process carried out shows that student activities during learning are not enthusiastic, students learn only by using books as learning media. From a technological point of view, SMK Negeri 2 Kisaran already has ICT facilities such as projector screens and computers to support the use of multimedia.

The use of media in the form of videos, animations, pictures, music, and so on is still very rarely used because learning media related to this is not available. Student learning outcomes in science lessons also seem to be low. In terms of the use of learning media, especially in the form of multimedia, it can improve learning outcomes. Learning multimedia improves learning outcomes not only in terms of students' knowledge [2], but also in improving students' character (attitude and motivation) [3].

The results of an interview with one of the teachers in the science field at Kisaran State Vocational School 2 stated that the media used in the learning process only used teaching modules, besides that the teacher also allowed students to open websites to search for additional material. The supply of books and teaching modules for class X Science Science is still not available in the school library.

The TikTok app is a Chinese social network and music video platform launched in September 2016. The app allows users to create short music videos. Throughout the first quarter (Q1) of 2018, TikTok established itself as the most downloaded application, 45.8 million times to be exact. That figure beats

common applications such as YouTube, WhatsApp, Facebook Messenger, and Instagram. TikTok is also a video application that people often use to record their videos on their cellphones with a fairly short duration, from 15 seconds to 30 seconds to 1 minute, and this application is also a trending application at the moment. What's more, many people have used it because it's so much fun that TikTok has started to be widely used by Indonesians.

1.1 The Nature of Learning Outcomes of Natural and Social Sciences (IPAS)

According to Gagne in Setiawati [4] says that learning can also be interpreted as a process of change that is generally relatively permanent in the behavior of living things or organisms that occur as a result of experience. Learning is also the basis of future societal progress. Developments are created by individuals based on their learning abilities and their capacity to create discoveries which are passed on from generation to generation. According to Piaget in Dimiyanti and Mudjiyono [5] Learning is a process of acquiring knowledge. Knowledge is acquired by individuals. Individuals interact continuously with the environment. With the interaction with the environment, the function of the intellect is growing.

Susanto [6] said that learning outcomes are abilities that are acquired after going through learning activities. Because learning itself is a process of someone trying to obtain a form of behavior change that is relatively permanent. In learning activities or instructional activities, teachers usually set learning goals. Children who are successful in learning are those who succeed in achieving learning goals or instructional goals.

According to Suardi [7] learning outcomes are mastery of knowledge, skills, character, and the formation of attitudes and beliefs. Learning outcomes are not only knowledge and skills but also the development of emotions, attitudes, values, aesthetics, and art. The same thing was formulated by Baharuddin [8] according to him, learning outcomes are changes in the perpetrators of learning, both changes in knowledge, attitudes, and skills. With these changes, of course, the perpetrator will also be assisted in solving life's problems and can adapt to his environment.

According to Winkel (in Wirda [9]) states that learning outcomes are the success achieved by students, namely learning achievement in schools that manifests in the form of numbers. Learning outcomes are a reflection of a school.

Meanwhile, according to Hamid [10] learning outcomes are all effects that are used as indicators of the value of using a method under different conditions. This effect can be an effect that is deliberately designed because it is a desired effect and can also be a real effect as a result of using certain learning methods. Learning outcomes can be classified into 3 namely: (1) learning effectiveness, (2) learning efficiency, and (3) learning attractiveness.

The IPAS subject is the integration of natural sciences and social sciences into a subject called IPAS. The IPAS subject is an implementation subject of the independent curriculum. The Merdeka Curriculum is a curriculum with various intra-curricular learning where the content will be more optimal so that students have enough time to explore concepts and strengthen competence. In this curriculum, there are projects to strengthen the achievement of Pancasila student profiles. The

IPAS subject consists of three competency elements that refer to scientific literacy competencies, namely explaining phenomena scientifically; designing and evaluating scientific investigations; translate data and evidence scientifically. These three elements are delivered in the form of a project so that the learning method is automatically carried out on a project basis.

Science has an object of study in the form of concrete objects found in nature and is developed based on empirical experience. In addition, the IPAS project is packaged in the form of project-based learning which integrates several elements so that students not only understand the content but also develop skills on how to take a role in society. The form of science learning in schools is that students present and make project reports by attaching documents during the project. Assessment is carried out using formative and summative assessments.

1.2 The Nature of Video Learning Media

Quoting Gagne's opinion, Sadiman [11] emphasized educational media or learning media with various components in the student's environment that can stimulate them to learn. Furthermore, it states that learning media are all physical devices that can present messages and stimulate students to learn in the form of books, films, tapes, and so on. In line with that, Suryani [12] learning media are all forms and means of conveying information that is made or used by learning theory that can be used for learning purposes and convey messages, stimulate thoughts, feelings, attention, and willingness of students to encourage a learning process that is intentional, purposeful and controlled.

Based on this, Arsyad [13] emphasized that direct experience will provide the most complete and meaningful message regarding the information and ideas contained in that experience because it involves the senses of sight, hearing, smell, and taste. This means that the more senses involved, the higher the achievement of learning outcomes. Meanwhile, according to Suryani et al [14], Dale's cone of experience has implications for determining the learning methods and materials used in class. In this psychological context, the role of learning media is of course very important because learning media involves the five senses including sight and hearing, and makes something abstract becomes real audiovisual.

Nurseto in Pakpahan [15] describes some of the benefits of media as follows: (1) It can foster student learning motivation because the material presented can attract more attention. (2) Mastery of the material is better, because it allows teaching materials delivered through the media to be accessed repeatedly. (3) Learning methods will be more varied. (4) Students become more active because learning media can encourage students to actively interact with the learning media used.

Media in education is used to create interaction and communication between teachers and students in the learning process. Teaching aids, learning resources, and teaching aids are called learning media [16]. Audio-visual media is a media device that can simultaneously display sound and images at the same time and contains learning messages. Audio-visual media that display motion is called video. Video learning media is an audio-visual tool that contains messages and information to create communication and interaction in the learning process.

Video is a series of motion pictures accompanied by a sound that forms a unit that is strung together into a plot, with

messages in it for the achievement of learning objectives which are stored by storage process on tape or disk media [17].

1.3 The Nature of the Tiktok Application

TikTok has optimized the experience in terms of interface design and interactive content production models [18]. As well as these applications are friendly to use while at the same time providing content production more broadly and easily for use in learning [19]. TikTok is an audio-visual application that provides pedagogical skills, realistic experiences, and increased motivation, and involves students as creators [20]. And very good for supporting student creativity [21].

Learning media in the form of the TikTok application can be applied to Android and IOS. This allows learning media to be accessed and operated anytime and anywhere. This type of learning media is included in the category of mobile learning-based learning media. This statement is to the definition of mobile learning by O'Malley, which is learning in which the learner does not stay in one place or learning activities that occur when students use technological devices. TikTok is an application that provides unique and interesting special effects that users can easily use so they can make short videos with cool results. This short video social application has a lot of music support so that its users can perform with dance, freestyle, and much more so that it encourages creativity to use it as a content creator.

The TikTok application includes several features that assist in the learning process, namely: (1) Voice recording, which records sound through the device and is then integrated into the TikTok account; (2) Recording a video using the device to record the video, then integrate it into the TikTok account; (3) Background is a feature that allows you to add background sounds that can be downloaded from the TikTok application storage media; (4) Edit which functions to improve and edit previously made draft videos; (5) Share function which is used to share created videos; and (6) Duet, which allows for collaboration with other TikTok app users.

The research problem is formulated as follows: (1) Is the developed TikTok content-based learning media appropriate for use to improve science learning outcomes?; (2) Is the developed TikTok content-based learning media effectively used to improve science learning outcomes?

2. METHOD

The research that will be carried out is a type of research on the development of video learning media based on TikTok content. This type of research uses the Research and Development (R&D) method. According to Mulyana [22], R&D research is a type of research whose goal is to create and develop new products using certain steps. development model Alessi and Trollip [23] provide a model for developing interactive multimedia materials that have three attributes that are always present and three phases, each consisting of various problems to be addressed and actions to be taken. The three attributes are standards, continuous evaluation, and project management. The three phases are planning, design, and development. This model is illustrated in the following Figure 1:



Figure 1. Alessi and Trollip Design and Development Model [24]

This research is located at SMK Negeri 2 Kisaran which is located at Jalan Besar Sei Renggas, Sei Renggas Village, West Kisaran District, Asahan Regency. This research was conducted in the even semester of the 2022/2023 school year. Research subjects are research boundaries where researchers can determine them with objects, things, or people to attach research variables. The subjects in this study were class X students of SMK Negeri 2 Kisaran. Class X APAT is the experimental class and class X TKJ 1 is the control class. The object of this study is material on Economic Behavior and Social Welfare in Science Science lessons.

The procedure in this study adopts the learning multimedia development model developed by Stephen M. Alessi and Trollip which has three stages as follows: the planning stage, design stage, and development stage. This model was chosen to help create effective educational programs and have a more practical process. The steps refer to the three stages of implementing the research and development strategy.

- Planning Stage (Planning): Determine Scope; Identify Student Characteristics; Identify Supporting Resources; Doing Brainstorming;
- Design Stage (Design): Determine Learning Scenarios and source material; Create flowcharts; Determining and prepare the application;
- Development Stage (Development): Preparing material for the TikTok application. The material is prepared and arranged according to the learning objectives; Merge all the components that have been created. After the material is prepared, the components in the form of text, sound, and video animation are combined into the application we want to use; Create products. After the material is prepared, the next step is to make the product. The product is in the form of learning videos that have been compiled by combining text, sound, and video animation into the TikTok application, and the videos are used as learning content. Before the product is produced, the product is first tested or validated by material experts, media experts, and design experts. Material experts are carried out by Educational Technology Lecturers and Science subject teachers at SMKN 2 Kisaran. Then the media expert will be validated by the Educational Technology Lecturer and the design expert will be validated by the Educational Technology Lecturer. Then the product was tested on class X students at SMKN 2 Kisaran. after being tested, the product is ready

to be used as a video learning media based on TikTok content.

d. Product Trial: Trial Design; Validators and Test Subjects.

Data collection was carried out using a questionnaire distributing questionnaires to the respondents, namely material experts, media experts, design experts, and students' responses. Respondents gave an assessment of the quality of video learning media based on Tiktok content with the provisions of the research criteria in Table 1 below:

Table 1. Scoring Rules

No	Category	Score
1	Very good	5
2	Good	4
3	Pretty good	3
4	Not good	2
5	Not good	1

Table 2. Interpretation of Eligibility for Media and Multimedia videos based on Tiktok content

No	Interval Mean Score	Interpretation	Acceptance
1	1,00 – 2,49	Not feasible	Low acceptance
2	2,50 – 3,32	Less feasible	Acceptance is sufficient
3	3,33 – 4,16	Decent	High Acceptance
4	4,17 – 5,00	Very decent	Acceptance is very high

(Source: Sriadhi, [25])

Based on the quantitative data from the results of the validator by material experts, media experts, and student response questionnaires, the next step is to analyze the data and calculate the percentage level of achievement based on the formula:

$$P = \frac{\sum x}{\sum x_i} \times 100 \%$$

Information:

x : The answer score from the validator

x_i : Score the highest answer

P : Presentation of eligibility level

The feasibility and effectiveness criteria achieved are used in the development of TikTok content-based video learning media described in Table 3 below.

Table 3. Product Validation Criteria

Percentage %	Validity Level	Information
81,00 – 100,00	Very valid	Can be used without revision
61,00 – 80,00	Valid	Usable with minor revisions
41,00 – 60,00	Less valid	It is recommended not to be used because it is heavily revised
21,00 – 40,00	Invalid	Shouldn't be used, needs major revision
00,00 – 20,00	Totally invalid	Should not be used

The video learning media based on Tiktok content that was developed received a positive response from students if the

percentage obtained from the student response questionnaire reached a score of $\geq 60\%$, then PjBL-based Interactive Multimedia learning media was categorized as feasible and effective.

Testing the hypothesis in this study was carried out by comparing experimental values, namely by comparing the posttest scores of students who used TikTok content-based video learning media with students who did not use TikTok content-based video learning media shown in Table 4 below:

Table 4. Product Effectiveness Treatment Design

Group	Pretest	Treatment	Posttest
A	To	X1	T1
B	To	X2	T1

Group A is an experimental class (X APAT) that uses video learning media based on TikTok content in learning science. Meanwhile, group B is the control class (X TKJ 1) which applies conventional learning (without using tiktok content-based video learning media). The learning achievement test was given to the two groups after undergoing three learning meetings to find out the difference in the average learning outcomes between the experimental class and the control class.

Product Eligibility:

$H_0 : \mu_1 \leq \mu_2$

$H_a : \mu_1 \geq \mu_2$

Information :

μ_1 : average learning outcomes of students using video learning media based on tiktok content

μ_2 : average student learning outcomes by not using video learning media based on tiktok content.

Furthermore, to test the hypothesis, the two-party test formula is used. The t test is used if the alternative hypothesis reads "bigger" or above ($>$). For research data that is normally distributed and homogeneous, the hypothesis testing uses the t-test with the formula:

$$t = \frac{\bar{x}_1 - \bar{x}_2}{S \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}$$

Where S is the root of the combined variance calculated by the formula:

$$S^2 = \frac{(n_1 - 1)S_1^2 + (n_2 - 1)S_2^2}{n_1 + n_2 - 2}, \text{ dimana } S = \sqrt{S^2}$$

Where :

\bar{x}_1 = average score of the experimental class

\bar{x}_2 = average score of the control class

n_1 = the average number of experimental classes

n_2 = the average number of control classes

S_1^2 = variance of the experimental class group

S_2^2 = variance of control class group

S = combined variance

t = calculation price

The test criteria are accepted H_0 if $t_{count} > t_{table}$ is obtained from the t distribution list with $dk = (n-1)$ with a significant level of $\alpha = 5\%$, then the teaching material is effectively used.

3. RESULTS AND DISCUSSION

3.1 RESULTS

The results of the assessment by media experts, material experts, individual trials, small group trials and limited field

trials for all aspects of the assessment are determined by the average score. The results of the assessment are then analyzed and determined whether or not it is appropriate to develop TikTok content-based learning media. The average percentage of the results of the assessment of media experts, material experts, individual trials, small group trials and field trials is shown in table 5 below:

Table 5. Average Percentage of Assessment Results for TikTok content-based learning media

No	Categorization	Percentage of average score%	Criteria
1.	Material Expert Validation	90,00	very feasible
2.	Media Expert Validation	85,26	very feasible
3.	Learning Design Validation	91,35	very feasible
4.	Individual Trial	92,66	very feasible
5.	Small Group Trial	95,40	very feasible
6.	Field Test	98,62	very feasible
Rata-rata		92,22	very feasible

TikTok content-based learning media shows that: Material Expert Validation is 92.94% very feasible category; Media Expert Validation of 91.76% very feasible category, Learning Design Validation of 95.55% very feasible category; Individual Trial of 94.00% very feasible category, Small Group Trial of 95.66% very feasible category; Field trials of 98.26% very feasible category, an average of 94.70% very feasible category, which means the use of TikTok content-based learning media meets the needs of students.

Based on the learning outcomes of students who were taught using video learning media based on Tiktok content at SMK Negeri 2 Kisaran, the lowest score was 70 and the highest score was 95. The average score was 84,593, mode 83.25, median 82.5 and standard deviation 7.404. To see student scores, interval class is used, namely the score between absolute frequency (the number of students who have learning achievement scores) and relative frequency (the number of percent of learning achievement scores). A complete description of learning outcomes using TikTok content-based videos is shown in table 6.

Table 6. Frequency Distribution of Experiment Class Student Learning Outcomes

Kelas	Interval Kelas	F. Absolut	F. Relatif %
1	70 – 74	3	9,375%
2	75 - 79	6	18,75%
3	80 - 84	8	25%
4	85 - 89	6	18,75%
5	90 - 94	6	18,75%
6	95 - 99	3	9,375%
Jumlah		32	100

Berdasarkan hasil belajar siswa yang diajarkan dengan menggunakan pembelajaran konvensional di SMK Negeri 2

Kisaran diperoleh skor terendah 70 dan skor tertinggi 95. Nilai rata-rata skor 80.718, modus 81,25, median 80.5, dan simpangan baku 6,744. Secara lengkap gambaran tentang hasil belajar dengan menggunakan media pembelajaran konvensional ditunjukkan pada tabel 7.

Table 7. Frequency Distribution of Control Class Student Learning Outcomes

Class	Interval Class	F. Absolute	F. Relative %
1	70 - 74	3	9,375%
2	75 - 79	7	21,875%
3	80 - 84	9	28,125%
4	85 - 89	6	18,75%
5	90 - 94	5	15,625%
6	95 - 99	2	6,25%
Total		32	100

The analysis requirements test performed is the normality and homogeneity tests. Testing was carried out using the Liliefors test. A summary of the normality of the two samples can be seen in Table 8 below:

Table 8. Summary of Data Normality Test with Liliefors

No.	Data	Class	Lcount	Ltable	Conclusion
1	Pretest	Experiment	0,097	0,16	Normal
2	Pretest	Control	0,060	0,16	Normal
3	Posttest	Experiment	0,124	0,16	Normal
4	Posttest	Control	0,118	0,16	Normal

Based on Table 7, it can be seen that the results of the pretest data normality test in the experimental class obtained $L_{count} < L_{table}$ ($0.097 < 0.157$) and in the control class also obtained $L_{count} < L_{table}$ ($0.060 < 0.157$). The same thing also happened to the posttest data normality test results for the experimental class with $L_{count} < L_{table}$ ($0.124 < 0.157$) and in the control class obtained $L_{count} < L_{table}$ ($0.105 < 0.157$). Thus, it can be concluded that the pretest and posttest data in the experimental and control classes are normally distributed at the significance level $\alpha = 0,05$

A summary of the homogeneity of the two samples is seen in Table 9 below:

Table 9. Summary of Data Homogeneity Test with Fisher's Test

No.	Data	Class	Fcount	Ftable	Conclusion
1	Pretest	Experiment	1,02	1,83	Homogeneous
2	Pretest	Control			
3	Posttest	Experiment	1,61	1,83	Homogeneous
4	Posttest	Control			

Based on Table 8, it can be seen that the results of the calculation of the pretest data homogeneity test in the experimental class and control class at a significant level $\alpha = 0.05$ obtained $F_{count} < F_{table}$ ($1.02 < 1.83$), it can be concluded that the pretest data in the two classes have the same or homogeneous variance. Then in the posttest data homogeneity test in the experimental class and control class at a significant level $\alpha = 0.05$ obtained $F_{count} < F_{table}$ ($1.61 < 1.83$), it can be concluded that the posttest data in the two classes have the same or homogeneous variance.

Hypothesis testing uses the t-test with the formula, namely:

$$t = \frac{\bar{x}_1 - \bar{x}_2}{s \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}$$

The following is the formulation of this statistical hypothesis, namely:

- Ho : $\mu A1 \leq \mu A2$
 Ha : $\mu A1 > \mu A2$

Information:

- $\mu A1$: average student learning outcomes taught using TikTok content-based learning media on the subject of IPAS
 $\mu A2$: average student learning outcomes taught without using TikTok content-based learning media on the subject of IPAS

The t-test is used as a hypothesis-testing tool because the research data is normally distributed and homogeneous. The hypothesis in the research is:

- Ho: TikTok content-based learning media is not effective in improving science learning outcomes.
 Ha : TikTok content-based learning media is effective in improving science learning outcomes

Hypothesis testing in this study was carried out using the t-test formula. The t-test was conducted to find out whether there were significant differences between learning outcomes in classes taught using video-based TikTok content (experimental class) and learning outcomes taught using conventional learning media (control class). The calculation results obtained $t_{count} = 2.18$ and $t_{table} = 1.66$ so that $t_{count} > t_{table}$ at a significant level $\alpha = 0.05$. Based on these results, that H_0 is

rejected and H_a is accepted or in other words, there is a significant difference between student learning outcomes in the experimental and control classes at a significance level of 5%. Thus, the learning outcomes of students who are taught using video learning media based on TikTok content have differences from the learning outcomes of students who are taught with conventional learning media and are declared feasibility tested.

To test the effectiveness of videos based on TikTok content being developed, the following calculations are carried out:

$$X = \frac{\text{total score obtained}}{\text{ideal total score of all items}} \times 100\%$$

$$= \frac{26}{32} \times 100\%$$

$$= 81,25\%$$

The value of the effectiveness of the Print Module can be seen as follows:

$$X = \frac{\text{total score obtained}}{\text{ideal total score of all items}} \times 100\%$$

$$= \frac{20}{32} \times 100\%$$

$$= 62,5\%$$

Based on the calculation of the effectiveness test on both, the results were obtained that the learning outcomes of students who were taught with videos based on TikTok content were higher than those of students with conventional learning media ($81.25\% > 62.50\%$). Thus it can be concluded that videos based on TikTok content are more effectively used in science learning at SMK Negeri 2 Kisaran compared to using conventional learning media.

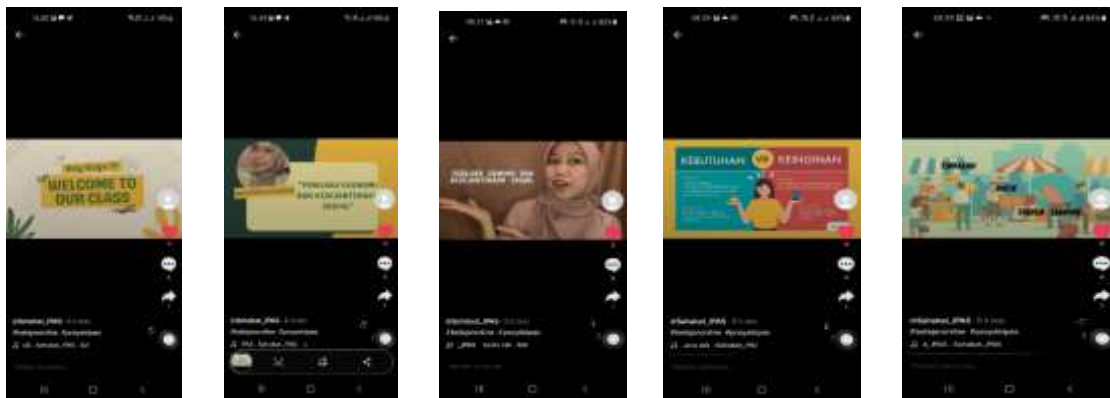


Figure 1. Video display based on science-learning TikTok content

3.2 DISCUSSION

Based on the results of the validation that has been carried out, the TikTok content-based video product is declared feasible to continue in field trials. The TikTok content-based videos that have been developed meet standards based on the design of the development of learning materials and learning media. For the assessment of learning material experts, a score of 90% was obtained which was categorized as very feasible and an assessment from learning media experts obtained a score of 85.26% which was categorized as very feasible. The score of student responses in individual trials was 92.66% (Very Eligible), small group trials were 95.40% (Very Eligible), and field trials were 98.62% (Very Eligible). Based on the results of the questionnaire, which were validated by material experts, and media experts and then continued with product trials, it can

be concluded that videos based on TikTok content in science learning are stated to be very suitable for use as learning media for SMK Negeri 2 Kisaran students.

The effectiveness test for videos based on TikTok content that has been developed is carried out to fulfill the procedures of the Alessi and Trolop models. The purpose of testing the effectiveness of this product is to determine whether the product needs to be used continuously because it is effective or discontinued. After all, it is not effective. Testing the effectiveness of the product on the developed TikTok content-based videos has been carried out by comparing the average value of student learning outcomes taught using TikTok content-based videos with those using conventional learning media. From the results of research data processing conducted, there were differences in learning outcomes between students

who were taught using videos based on TikTok content and those who used conventional learning media (81.25% > 62.50%).

This is in line with Santyasa [26] which states that the learning process should contain five communication components, namely the teacher (communicator), learning materials, learning media, students (communicants), and learning objectives. While learning media are all physical devices that can present messages and stimulate students to learn in the form of books, films, tapes, and so on [27].

Furthermore, Suryani [28] states that learning media are all forms and means of conveying information that is created or used by learning theory that can be used for learning purposes and convey messages, stimulate thoughts, feelings, attention, and willingness of students to encourage a learning process that is intentional, purposeful and controlled.

Media in education is used to create interaction and communication between teachers and students in the learning process. Teaching aids, learning resources, and teaching aids are called learning media [29]. Audio visual media is a media device that can simultaneously display sound and images at the same time and contain learning messages. Audio-visual media that display motion is called video [30].

The TikTok application learning media can be run on Android and iOS-based mobile devices. So that learning media can operate anytime and anywhere. This learning media is included in the category of mobile learning-based learning media. This is by the definition of mobile learning stated by O'Malley in Purbasari [31], which is learning in which the learner does not stay in one place or learning activities that occur when students use mobile technology devices.

This is to Miarso's statement in Mahnun [32] which states that the first thing a teacher must do in using media effectively is to find, find, and choose media that meet children's learning needs, attracts children's interest, according to their developmental maturity and experience and special characteristics that exist in the study group. These characteristics include the maturity of the child and his experience and background as well as mental conditions related to the age of his development. In addition to the problem of student interest in media, the representation of messages conveyed by teachers should also be considered in selecting media.

In terms of user experience, TikTok has optimized the experience in terms of interface design and interactive content production models [33]. As well as these applications are friendly to use while at the same time providing content production more broadly and easily for use in learning [34]. TikTok is an audio-visual application that provides pedagogical abilities, realistic experiences, increases motivation, and involves students as creators [35] and is very good for supporting student creativity [36].

This is in line with Aji [37] who stated that the use of the TikTok application as an interactive learning medium helps students understand and accept the learning process carried out by the teacher. Interactive learning media can represent what the teacher cannot convey, making the learning process more effective and efficient. Through the TikTok application, a teacher can easily create interactive learning to adapt to the environment, situation, and conditions of students.

Then according to Mufidah [38], the TikTok application can be used as an effective learning medium. The TikTok application meets the learning needs of students, can attract students' interest because of its novelty, and has many features that can be implemented in learning, and finally, the TikTok application is equivalent to the development of maturity and the characteristics of students who are millennials, who are attached and close to the world digital.

Based on some of the explanations above, it can be concluded that video learning media based on TikTok content can be called good learning media if the learning media can improve student learning outcomes. The use of TikTok content-based video media allows students to easily understand learning and master learning material. This is also to the results of the development of TikTok content-based video learning media at SMK Negeri 2 Kisaran which obtained decent results in terms of product development and was effective in improving student learning outcomes in the Sciences subject. In addition to the use of this media, the ability of the teacher also plays an important role as a motivator which greatly influences student learning outcomes because students must be motivated to be fully responsible for their learning assignments.

4. CONCLUSION

Based on the formulation of the problem, objectives, results, and discussion of research on the development of TikTok content-based video learning media previously described, the following conclusions can be drawn:

1. Video learning media products based on TikTok content that has been developed meet the requirements and are suitable for use as learning media. This was concluded based on research results from learning material experts (90%), media experts (85.26%), student responses to individual trials (92.66%), small group trials (95.40%), field trials (98.62%) who overall stated that TikTok's content-based video learning media was in the "very feasible" category.
2. The effectiveness of the developed TikTok content-based video learning media is considered more effective than conventional learning media. The results of hypothesis testing prove that there is a significant difference between the learning outcomes of students who are taught using videos based on TikTok content and the learning outcomes of students who are taught using conventional learning media. This is indicated by the results of data processing obtained $t_{count} = 2.18$ and $t_{table} = 1.66$ so that $t_{count} > t_{table}$ at a significant level $\alpha = 0.05$. So the learning outcomes of students taught with TikTok content-based video learning media have a higher effectiveness of 81.25% compared to learning outcomes using conventional learning media with effectiveness of 62.50%.

5. REFERENCES

- [1] Arsyad, A. 2017. Media Pembelajaran. Jakarta: Rajawali Pers.
- [2] Serevina, V. Astra, I., & Sari, I. J. 2018. Pengembangan E-modul Berbasis Problem Based Learning (PBL) Pada Kalor dan Temperatur untuk Meningkatkan Keterampilan Proses Sains Siswa. Jurnal Online Teknologi Pendidikan Turki-TOJET, 17(3), 26-36
- [3] Jaenudin, J., Nindiasari, H., & Pamungkas, A. S. 2017. Analisis Kemampuan Berpikir Reflektif Matematis Siswa Ditinjau dari Gaya Belajar. Prima: Jurnal Pendidikan Matematika, 1(1), 69-82.

- [4] Setyawati, S. M. 2018. Biodiversitas Capung Subordo Anisoptera di Sekitar Aliran Sungai Muria Desa Colo Kudus. *Jurnal of Biology Education*, 3(1), 1-10.
- [5] Dimiyati, & Mujdiono. 2006. *Belajar dan Pembelajaran*. Jakarta: PT Rineke Cipta
- [6] Susanto, S., Safrida, L. N., & Kurniati. D. 2015. Analisis Proses Berpikir Siswa dalam Pemecahan Masalah Terbuka Berbasis Polya Sub Pokok Bahasan Tabung Kelas IX SMP Negeri 7 Jember. *Kadikma*, 6(1), 12-22.
- [7] Suardi, M. 2018. *Belajar dan Pembelajaran*. Bandung: Deepublish
- [8] Baharuddin H dan Esa Nur Wahyuni. 2016. *Teori Belajar dan Pembelajaran*. Yogyakarta : Ar- Ruzz Media
- [9] Wirda, Y., Ulumudin, I., Widiptera, F., Fujianita, S. 2020. Faktor-faktor Penentu Hasil Belajar Siswa. Jakarta: Pusat Penelitian Kebijakan, Badan Penelitian dan Pengembangan dan Perbukuan, Kementerian Pendidikan dan Kebudayaan
- [10] Hamid, Abdul K. 2014. *Teori Belajar dan Pembelajaran*. Medan: Program Pascasarjana Universitas Negeri Medan
- [11] Sadiman, A. Rahardjo, R. & Harjito. 2012. *Media Pendidikan*. Jakarta: Rajawali Pers, p.6.
- [12] Suryani, N., Setiawan, A., & Putra, A. 2018. *Media Pembelajaran Inovatif dan Pengembangannya*. Jakarta: Remaja Rosdakarya, p.32
- [13] Arsyad, A. 2017. *Media Pembelajaran*. Jakarta: Rajawali Pers. p.13
- [14] Suryani, N., Setiawan, A., & Putra, A. 2018. *Media Pembelajaran Inovatif dan Pengembangannya*. Jakarta: Remaja Rosdakarya, p.14
- [15] Pakpahan, R., & Fitriani Y. 2020. Analisa Pemanfaatan Teknologi Informasi dalam Pembelajaran Jarak Jauh di Tengah Pandemi Virus Corona Covid-19. *JISAMAR (Jurnal Sistem Informasi, Terapan, Manajemen, Akuntansi dan Riset)*, 4(2), 30-36.
- [16] Ramli, M. 2012. *Media dan Teknologi Pembelajaran*. Banjarmasin: Antasari, p.2.
- [17] Rusman. 2013. *Belajar dan Pembelajaran Berbasis Komputer*. Bandung: Alfabeta, p.218
- [18] Yu, J. X. 2019. Original Paper Research on TikTok App Based on User-Centric Theory. *Applied Science and Inovative Research*, 3(1), 28-36.
- [19] Dillon, M. 2020. *Introduction to sociological theory: Theorist, concept, and their applicability to the twenty-first century*. USA: John Wiley & Sons
- [20] Koumi, J. 2015. Learning outcomes afforded by self-assessed, segmented video print combination. *Cogent Education*, 2(1), 10-41
- [21] Jung, et all. 2019. Embedded cooling with 3D manifold for vehicle power electronics application: single-phase thermal-fluid performance. *International Journal of Heat and Mass Transfer*, 130 (2), 1108-1119.
- [22] Mulyana, M., Intaha, A. M., Saputra, Y. M. (2020). Pengaruh Media Poster dan Video Pembelajaran Terhadap Penguasaan Keterampilan Pencak. *Jurnal Penelitian Pendidikan*, 20(2), 145-153.
- [23] Alessi, S. M. & Trollip, R. S. 2001. *Media for learning: Methods and development (3rd ed.)*. Boston: Allyn and Bacon, p. 407-561
- [24] Alessi, S. M. & Trollip, R. S. 2001. *Media for learning: Methods and development (3rd ed.)*. Boston: Allyn and Bacon p. 407-561
- [25] Sriadhi. 2018. Instrumen Penilaian Multimedia Pembelajaran V2.1. Retrieved April 13, from Research Gate: https://www.researchgate.net/publication/329656294_Instrumen_Penilaian_Multimedia_Pembelajaran_V21
- [26] Santyasa, I. W. 2007. *Model-model Pembelajaran Inovatif*. Bali: Universitas Pendidikan Ganesha, p. 3
- [27] Sadiman, A. Rahardjo, R. & Harjito. 2012. *Media Pendidikan*. Jakarta: Rajawali Pers
- [28] Suryani, N., Setiawan, A., & Putra, A. 2018. *Media Pembelajaran Inovatif dan Pengembangannya*. Jakarta: Remaja Rosdakarya, p.5
- [29] Ramli, M. 2012. *Media dan Teknologi Pembelajaran*. Banjarmasin: Antasari, p.2.
- [30] Sadiman, A. Rahardjo, R. & Harjito. (2012). *Media Pendidikan*. Jakarta: Rajawali Pers, p.74.
- [31] Purbasari, M. 2013. Pengaruh Supervisi Akademik Terhadap Kinerja Mengajar Guru Sekolah Dasar. *Jurnal Pendidikan Dasar*, 4(1), 46-52.
- [32] Mahnun, N. 2012. *Media Pembelajaran (Kajian Terhadap Langkah-langkah Pemilihan Media dan Implementasinya dalam Pembelajaran)*. *Jurnal Pemikiran Islam*, 37(1), 56-78
- [33] Yu, J. X. 2019. Original Paper Research on TikTok App Based on User-Centric Theory. *Applied Science and Inovative Research*, 3(1), 28-36.
- [34] Dillon, M. (2020). *Introduction to sociological theory: Theorist, concept, and their applicability to the twenty-first century*. USA: John Wiley & Sons.
- [35] Koumi, J. 2015. Learning outcomes afforded by self-assessed, segmented video print combination. *Cogent Education*, 2(1), 10-41
- [36] Jung & Zhou, et all. 2019. Embedded cooling with 3D manifold for vehicle power electronics application: single-phase thermal-fluid performance. *International Journal of Heat and Mass Transfer*, 130 (2), 1108-1119.
- [37] Aji, Wisnu Nugroho. 2020. “Aplikasi Tik Tok Sebagai Media Pembelajaran Keterampilan Bersastra”. *Jurnal Metafora*. 6(2)
- [38] Mufidah, Alfi dan Rifa Mufidah. 2021. Aplikasi TikTok dan Instagram Sebagai Salah Satu Alternatif dalam Media Pembelajaran IPA. *PISCES: Proceeding of Integrative Science Education Seminar*. 1(1).