



How to Use Multimedia Whiteboard Animation for Scientific Works Companying? (Case Study in UPBJJ UT Semarang)

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Abstract: The research objective is multimedia whiteboard animation's impact on understanding and completing the preparation of non-basic education (non-pendas) students' scientific work at UPBJJ UT Semarang. The research objects are 123 non-pendas students taking scientific work courses at UPBJJ UT Semarang, which are explored using a questionnaire. The research used a qualitative analysis of the completion of the preparation of scientific papers using the Whiteboard Animation learning media. The learning process showed the average good and very good answers of 63.41% in the high category, 68.09% in the very high category for content of learning materials, and 60.16% in the high category for the impact of Whiteboard Animation. Overall, students' perception of the Whiteboard Animation-based learning process is very effective, proven by: 1) 85 students (69.10%) uploaded their scientific work before the lecture was over, 2) the average value of students' perceptions for all indicators was high. The limitations are the difficulty of controlling respondents because the experiment was carried out by students online. The factors assessed are only learning media. To determine whether students will pass or fail, it is not the tutor in charge of this course but the students. Even though students have uploaded scientific papers, they cannot determine it.

Keywords: whiteboard animation; scientific work; media; learning

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INTRODUCTION

Modern technology has created an unprecedented leap in all fields. The breadth of information and the internet network makes accessing information easy. Therefore, technology must be used in all areas of life and knowledge, including education, to improve students' intellectual and cognitive abilities (Jafar & Alstersawi, 2019). Therefore, it is imperative to use information techniques and innovations to improve the quality of education by developing programs or media that can increase students' understanding. Modern technology contributes to the development of educational processes, scientific research, and learning media where new electronic technologies are introduced and developed to improve understanding of learning in the educational process. The emerging technology field provides interactive media that make the educational process more flexible and enhance cognitive abilities that contribute to increased achievement.

In the teaching and learning process, especially in higher education, it is necessary to use appropriate teaching materials or methods so that learning becomes more interesting. Computers are tools to assist and facilitate the teaching and learning process. A great learning model is a media-based arithmetic learning model. Students are relied on to be more active in learning, positive, inventive, helpful, and inspiring (Dalis, 2017). The interactive concept in multimedia technology helps the human brain to improve the learning process. In addition, the different multimedia approaches make lessons entertaining and provide information more effectively and faster. Learning media can clarify the presentation of messages and information to facilitate and improve students' learning processes and outcomes. Learning media can increase and direct students' attention, leading to learning motivation (Kustandi & Bambang, 2013). The development of learning media in the form of animation is the most dominant thing formulated very creatively. Animation plays a vital and effective role in creating attractive and accessible media for students to remember.

Learning media is very important in learning because the ambiguity of the material presented can be helped by using the media as an intermediary. All the complexities of teaching materials can be further simplified with the help of media. Learning media can represent what the lecturer cannot convey through particular words. Learning media can also help in concretizing abstract material. In addition Hasan (2017) revealed that "Media-based screencast o-Matic videos can increase interest in learning and the easy absorption of the material." Through videos, teaching materials can be virtualized in various formats to be more interesting and dynamic, motivating students to go further in the learning process. Learning video media is a tool used by educators to stimulate the feelings, thoughts, and desires of students by displaying ideas, ideas, messages, and information

in an audio-visual way (Wisada & Sudarma, 2019). The use of instructional video media can stimulate students' motivation to learn because there is curiosity about the videos displayed to increase students' understanding of the material (Kirana, 2016). Whiteboard animation is interactive video media, usually displayed as a whiteboard or something resembling a whiteboard. Unlike traditional animation, whiteboard animation can represent concepts and does not focus solely on narrative explanations. Whiteboard animation places an animated picture to help students understand the concept of the learning material. With this animated picture, it is hoped that the learning process will be easier to understand the steps that must be taken and can convey the main points of the learning objectives. This whiteboard animation process starts from images made in the form of animation to facilitate learning that contains multimedia media with emotional designs. Emotional design is a term used to describe visual design elements in a learning environment that affect students' emotions and encourage learning (Plass et al., 2014).

Recent research in the development of whiteboard animation has shown that whiteboard animation has been used as an effective and fascinating tool to encourage learning (Bradford & Bharadwaj, 2015). The use of whiteboard animation is considered more effective in education than traditional methods (explaining) (Lee et al., 2013). Learning media with whiteboard animation provides a difference between the results of students taught by videoscribe media and the learning outcomes of students taught without videoscribe (Ismail & Enawaty, 2016). Whiteboard animation is suitable as a learning medium (Purnama et al., 2017). The application of whiteboard animation in learning is better than students taught conventionally (Rasyid et al., 2022). Learning with interactive whiteboard media improves students' motivation and learning outcomes. Educators also increase their ability to develop learning (Manny-Ikan et al., 2012). Koçak and Gülcü (2013) in their research concluded that learning using whiteboard media can solve the difficulties experienced by students in receiving lecture material. While research using whiteboard animation was put forward by (Wijayanti et al., 2018), stating that whiteboard animation-based mathematics learning media is very effective in increasing students' motivation and learning outcomes.

In the tutorial process for the scientific *Karya Ilmiah* (Karil) students, there are problems understanding the preparation of scientific papers. It occurs in the majority of students taking scientific work courses. Another factor that causes students difficulty composing scientific papers is the lectures' remote guidance instead of face-to-face. This condition results in insufficient attention and material absorption. The insufficient absorption capacity is reflected in the quality of scientific work far from the criteria it should have. Another factor in the field is that scientific work tutors still do not use suitable media. Some tutors still rely on exposing the core of teaching materials, and others use projectors to convey the core of teaching materials without using interactive media to encourage and make students understand the material. Seeing such problems, tutors must take advantage of animation media, one of which is Whiteboard animation. Based on research and the problems in arranging students' scientific work, it is more due to the lack of tutors in utilizing technology. Therefore, this study seeks to assess and measure the impact of using multimedia whiteboard animation on understanding and speed of completion of the preparation of scientific papers for non-basic education students at UPBJJ UT Semarang. The problem is that researchers are trying to find answers from the use of this learning media, which is to find out the impact of using Video Scribe Whiteboard Animation-based learning media in increasing students' motivation and understanding in taking scientific work courses and whether this can increase speed in completing the preparation of the scientific work.

METHODS

The research will analyze "Impact of the Use of Multimedia Whiteboard Animation on Understanding and Completion Speed of Scientific Writing for Non-Basic Education Students (Non-Pendas) at UPBJJ UT Semarang." This research intends to explain the impact of the use of Multimedia Whiteboard Animation on the speed of completion of scientific work. Knowledge through students' perceptions with a previously formulated questionnaire. The object of the research is non-pendas students at Pokjar UPBJJ-UT Semarang with students at the Faculty of Economics and Faculty of Law, Social, and Political Science. The analysis of students' learning motivation in this study was carried out using a questionnaire. The result measurement criteria use a classification determined by the ideal mean and standard deviation.

Table 1. Classification of Students' Learning Motivation

Score	Classification
$X \geq 69$	Very high
$65.99 > X \geq 57.5$	High
$56.99 > X \geq 46$	Low
$X < 45.99$	Very low

To find out the increase in students' learning motivation with whiteboard animation-based media, researchers used a questionnaire at the end of the lesson with the same statement in each questionnaire. This was done to ensure that researchers knew how much students made increased positive attitudes.

Table 2. Classification of Students' Learning Outcomes

Score	Classification
$X \geq 80$	Very high
$79.99 > X \geq 66$	High
$65.99 > X \geq 56$	Low
$X < 55.99$	Very low

The criteria for success in this study include: (1) lecturers carried out learning with good classifications to increase students' motivation and learning outcomes, (2) students' learning motivation is very high, (3) 66% of students' learning outcomes score are on high criteria.

RESULT AND DISCUSSION

Analysis of Students' Learning Motivation

Multimedia whiteboard animation with material for the preparation of scientific works aimed at improving students' ability to solve problems (problem-solving) in preparing scientific works for teachers. Multimedia is simply the coordination of verbal messages and images. Interactive multimedia controls the user, and the user can use it according to the rhythm of his learning. Interactive multimedia forms used for learning are tutorials, drills and practices, edutainment, simulations, and problem-solving. One of the characteristics of multimedia is the use of animated whiteboard videos to present material. Whiteboard animation is similar to motion graphics, a combination of various visual-based digital art forms, including photos, images, and graphics, with music. The impact of whiteboard animation on students' learning motivation in this study is based on students' perceptions. This study looks at the initial learning process up to students' outcomes, in this case, is the process of compiling student scientific papers sent to the website of Universitas Terbuka, which is the students' right. Based on the data on the questionnaires filled out by students, it can be broadly classified as follows:

Table 3. Students' Answers Regarding the Learning Process with Whiteboard Animation

Question	Answer	Score	F	%
Do you enjoy the learning process using the Whiteboard Animation media?	Very bad	1	1	0.81%
	Bad	2	3	2.44%
	Average	3	42	34.15%
	Good	4	59	47.97%
	Very good	5	18	14.63%
Are you more focused on learning using the Whiteboard Animation media?	Very bad	1	1	0.81%
	Bad	2	7	5.69%
	Average	3	46	37.40%
	Good	4	50	40.65%
	Very good	5	19	15.45%
Is the learning process more interesting by using the Whiteboard Animation media?	Very bad	1	1	0.81%
	Bad	2	5	4.07%
	Average	3	36	29.27%
	Good	4	52	42.28%
	Very good	5	29	23.58%
Are you more active in learning activities using the Whiteboard Animation media?	Very bad	1	1	0.81%
	Bad	2	4	3.25%
	Average	3	40	32.52%
	Good	4	57	46.34%
	Very good	5	21	17.07%

Source: Data processed, 2022

Based on Table 3, from 123 students, the average of 56.10%-71.54% gave good and very good ratings. In good and very good categories, Sixty-nine students (56.10%) are more focused on learning using the Whiteboard Animation media. In the same categories, 81 students (71.54%) stated that the learning is more

interesting using Whiteboard Animation media. Overall, students' perceptions regarding learning process showed that the students' average learning motivation is 63.41% in the high category with the use of the Whiteboard Animation-based learning. Based on the data from the questionnaires, it can be broadly classified as follows:

Table 4. Students' Answers Related to Learning Content with Whiteboard Animation

Question	Answer	Score	f	%
Do the content and features of the Whiteboard Animation media help your understanding in writing scientific papers?	Very bad	1	1	0.81%
	Bad	2	7	5.69%
	Average	3	36	29.27%
	Good	4	60	48.78%
	Very good	5	19	15.45%
Does the suitability of the illustrations in the Whiteboard Animation media help your understanding in writing scientific papers?	Very bad	1	1	0.81%
	Bad	2	6	4.88%
	Average	3	36	29.27%
	Good	4	58	47.15%
	Very good	5	22	17.89%
Can examples of Compilation of Scientific Papers on Whiteboard Animation media help you in writing scientific papers?	Very bad	1	1	0.81%
	Bad	2	6	4.88%
	Average	3	37	30.08%
	Good	4	60	48.78%
	Very good	5	19	15.45%
Can the readability level of the summary at the end of the chapter on the Whiteboard Animation media help you in writing a scientific paper?	Very bad	1	1	0.81%
	Bad	2	4	3.25%
	Average	3	43	34.96%
	Good	4	53	43.09%
	Very good	5	22	17.89%
Can the order of presentation of the material in each illustration image on the Whiteboard Animation media help you in writing a scientific paper?	Very bad	1	1	0.81%
	Bad	2	3	2.44%
	Average	3	36	29.27%
	Good	4	61	49.59%
	Very good	5	22	17.89%

Source: Data processed, 2022

Table 4 about indicators of learning content with whiteboard animation presents the 123 students' answers to the questionnaires. The average of students assesses that the Whiteboard Animation content is good and very good (60.98 %-78.86 %). The least number of good and very good assessments is at the level of readability of the summary at the end of the chapter, with 60.98% (75 students). The most number of good and very good assessments is at the indicator of explaining the example of a compilation of scientific papers, with 78.86 % (81 students). Overall, the students' perception of the content of learning materials based on Whiteboard Animation achieved an average of good and very good answers of 68.09%, while students' learning motivation with Whiteboard Animation is in Very high category. Based on the data from the questionnaires, it can be broadly classified as follows:

Table 5. Students' Answers Related to Learning Content with Whiteboard Animation

Question	Question Answer	Score	f	%
Do you apply the material in each learning material session by drafting a scientific paper?	Very bad	1	1	0.81%
	Not enough	2	1	0.81%
	Enough	3	48	39.02%
	Well	4	54	43.90%
	Very good	5	19	15.45%
Is the draft of your scientific work easier after using the Whiteboard Animation media?	Very bad	1	1	0.81%
	Not enough	2	1	0.81%
	Enough	3	46	37.40%
	Well	4	52	42.28%
	Very good	5	23	18.70%

Source: Data processed, 2022

Table 5 about the indicators of the impact of learning with whiteboard animation presents the 123 students' answers to the questionnaires. The average number of students giving good and very good assessments is between 59.35% and 60.98%. The least number of good and very good assessments is at applying the material in each learning material session by drafting a scientific paper, with 59.35% (73 students). The most number of good and very good assessments is at drafting easier after using the Whiteboard Animation media, with 60.98% (75 students). Overall, the students' perceptions of the impact of Whiteboard Animation achieved an average of good and very good answers of 60.16%, while students' learning motivation with Whiteboard Animation is in high category.

Analysis of Learning Results

Based on the data from the questionnaires, it can be broadly classified as follows:

Table 6. Students' Answers Related to Learning Content with Whiteboard Animation

Research variable	Month	Number of Students Upload	Percentage
Upload scientific work to http://karil.ut.ac.id	April	38	44.71%
	May	14	16.47%
	June	33	38.82%

Source: primary data processed, 2022

Table 6 about the indicators of students uploading scientific works to <http://karil.ut.ac.id> presents the 123 students' answers to the questionnaires. Eighty-five students (69.10%) uploaded their scientific work to the web. Based on the month, most uploads were in April, with 38 students (44.71%). Overall, students' perception of the Whiteboard Animation-based learning process on UPBJJ UT Semarang is very effective. The indicators are the learning process, the content of the learning media, and its impact on students' understanding of scientific work writing. It is juxtaposed with the progress of students' scientific work, the learning media based on Whiteboard Animation, proven by: 1) 85 students (69.10%) uploaded their scientific work before the lecture is over, 2) the average value of students' perceptions of the indicators of the learning process, the content of the learning media, and its impact was high.

CONCLUSION

This study aims to determine the impact of whiteboard animation multimedia on understanding and completion of the preparation of non-basic education (non-pendas) students' scientific work at UPBJJ UT Semarang. It can be concluded that the learning process based on Whiteboard Animation assists students in completing scientific papers categorized as high, the content of learning materials based on Whiteboard Animation assists students in completing the scientific work categorized as very high, and the impact of Whiteboard Animation assists students in completing the scientific work categorized as high. Overall, students' perception of students shows various things related to the Whiteboard Animation-based learning process. This is very effective as evidenced by: 1) 85 students (69.10%) have uploaded scientific works before the lecture is over, 2) the average value of students' perceptions of the indicators of the learning process, the content of the learning media, and its impact was high. Of 123 students, 85 students upload scientific papers before learning is finished. So the percentage of success of the Whiteboard Animation learning media on the speed of completion of scientific papers is 69.10% in the high category. Whiteboard Animation media, in conclusion, is very effective.

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