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Usage Effectiveness of Video and Mama Card in Biology Learning of Reproductive System

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Abstract

Student learning outcomes of human reproductive system material under passing grade become an obstacle for students to achieve the learning objectives. Some students are not enthusiastic about human reproductive system material because it is considered difficult. Students still do not understand related to the structure and function of reproductive organ systems, abnormalities, and hormones. Based on the problems above then it takes a learning to attract attention or enthusiasm of students. Media is one of the important factors of teaching and learning process. Use of media aims to facilitate teachers in convey learning so students become more easily understand the material. The purpose of this research is to analyze the usage effectiveness of video and mama card in Biology lesson of human reproductive system material. This research used True Experimental Design with Pretest-Posttest Control Group Design. The analysis of data includes quantitative data on student activities and learning outcomes, then descriptive analysis of teacher's opinion and students' opinion. The result of this research showed that student activities and student learning outcomes in the experimental class is higher than the control class. Teacher and students gave positive reviews to the learning process. Based on the result of research, it was concluded that use of video and mama card was effective in increasing student activities and student learning outcomes in human reproductive system material.

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INTRODUCTION

Regulation of Minister of Education and Culture of the Republic of Indonesia Number 81A Year 2013 on the Implementation of the General Education Curriculum Guidelines states that learning is a process of educational activities which provides an opportunity for learners to develop their potential. Therefore, learning strategies should be directed to facilitate the achievement of competence which has been designed in curriculum documents and is able to cover some of the qualities that should be realized in the learning process such as creativity, self-reliance, cooperation, solidarity, leadership, empathy, tolerance, and skills of learners.

One of the main factors of successful learning is the ability of teachers in teaching, including the ability to develop teaching strategies that correspond to the learning objectives (Mikran *et al*, 2012). The success of teaching and learning can be seen in terms of process and outcome. In terms of the process, teachers can be said to be successful if it is able to involve the majority of students actively in the learning process, while in terms of results, the teacher said to be successful when learning that it provides is able to change the behavior of most students toward competency of basic competencies that good (Djamarah & Zain, 2010). Activities of students in the learning process are the thing to watch out for on the principle of learning is doing (*learning by* doing). That is why the student activities are the principle or principles that are important in the learning process (Mikran *et al*, 2012).

The use of media in the learning process aims to improve teacher in delivering material to the students become more easily understood and grasp the subject matter (Novrizal, 2015). One of the media used in the learning process is video. The video is an audio-visual media that can reveal objects or events such as the actual situation so that students are able to understand the materials which are abstract (Primavera, 2014). Other media that is used in learning is mama card (make a match card), a media that is used in learning that *makes a match* emphasis on student activities in search of knowledge (Ikasari, 2013).

The observation which is made during the month of July 2016 until the month of January 2017 at MAN 1 Magelang shows that during the last 2 years student learning outcomes in the human reproductive system material is only 10% -45% of students who pass the KKM (minimum score criteria). That is because the students still do not understand the material related to the human reproductive system structure and function of the reproductive organ system and hormonal disorders. In addition, students in learning activities are still less because students don't have an enthusiasm for items that associate the reproductive system hormones. According to Wianti (2010), student activities influence the student learning outcomes. The more activity the students do, the more materials they will get. In addition, learning activities in the classroom will affect the achievement of learning outcomes as the embodiment of good teaching can be seen from the learning activities of students in participating it.

Percentage of students who comprehend biology materials about the National Examination SMA/MA 2014/2015 school year mentioned the ability tested on material that explains the structure and function of the human organ system, as well as disorders/diseases that may occur in the organ at the level of the City/County Magelang has only 54.61% of absorption (Puspendik, 2015).

Based on the above problems, it can be understood that in the classroom, especially in the material about human reproductive system takes a learning that can attract or gain enthusiasm of students that are expected to create liveliness and motivation in learning so that students will have good learning outcomes.

One alternative to overcome the above problems is to use video and make a match card (mama card) as a learning media of human reproductive system learning. According to Wildan

(2015), studies which use video will improve learning outcomes and according to Rosmala (2015), application of learning models with Mama card at SMK Negeri 6 Purworejo can increase student participation from 62.50% to 83.65%. Therefore, the use of video and Mama card is expected to be easier for students to understand the material of human reproductive system.

RESEARCH METHOD

The research was conducted in the second semester of 2016/2017. This research uses a True Experimental Design with Pretest-Posttest Control Group Design. The population used in the research were all students of class XI Science. The specified sample is XI Science 1 and XI Science 2. The sampling method uses Random Sampling.

Procedures that compiled in this research were (1) an interview with Science eleventh grade teacher in MAN 1 Magelang; (2) planning of learning activities and learning tools; (3) making instruments and testing instruments; (4) testing the instrument on the sample; (5) analyzing trials using the validity, reliability, distinguishing features and level of difficulty; (6) implementing the learning activities and video *mamacard* on the human reproductive system material; (7) analyzing the data in the form of student learning outcomes, student activities, student and teacher responses; (8) finishing the results and evaluation.

RESULTS AND DISCUSSION

The results of this research include student activities, student learning outcomes, student's and teacher's responses. Data obtained from observation of student activities during the learning process of the human reproductive system is using video and mama card. Data obtained from the results of students' grades *pretest*, *posttest*, Student Discussion Sheet (SDS), and tasks.

The results of the student activities obtained from observations made by the observer. The result of student activities is used to determine the extent of enthusiastic students in each class during 8 meetings of the human reproductive system of learning material are presented in Table 1.

Table 1 Student Activities in Materials Human Reproductive System using Video and Mama Card in MAN 1 Magelang

CRITERIA	EXPERIME	EXPERIMENTAL CLASS		CLASS	
	Range Frequency		Range	Frequency	
Very high	80-100	11	80-100	5	
High	60-79.9	20	60-79.9	25	
Medium	40-59.9	0	40-59.9	0	
Low	20-39.9	0	20-39.9	0	
Very low	1-19.9	0	1-19.9	0	
Highest value	89.84		84.38		
Lowest value	61.72		61.72		
Average	77.14		73.07		

Based on the results of the student activities in table 1, it can be seen that the student activities during learning in the experimental and control classes included in the category of high and very high (Arikunto, 2007).

In the experimental group, 64.5% of student activities including high category and 35.5% are very high. while in the control class 75% of student activities including high category and 25% is very high. In general, both the experimental and control classes included in the category of high and

very high. Nevertheless, the student activities in the experimental class are higher than the control class.

To find out the difference between the results of the student activities experimental class and control class, then T-test showed in Table 2 below.

Table 2 t-Test Result of Student Activities H_0 rejected if the value sig(1-Tailed) < 0.05

	Levene's Test for t-test for Equality of Means Equality of Variances							
	F	Sig.	t	df	Sig. (1 tailed)	- Mean Difference	Std. Difference	Error
Equal variances assumed	0.038	0.846	-2.504	59	0.00375	-4.065	1.623	

 H_o accepted if the value sig(1-Tailed) >0.05

Based on the t-test Result of student activities in table 2, it shows that there are differences in the value of the results of the student activities which is the value of the experimental class is greater than the control class. It can be known from the value sig (1-tailed), namely 0.375> 0.05. Differences in the results of student activities that occurs between experimental class and control class can be caused by several factors, which are the use of media in the experimental class in a video that has the characteristics of audio (voice) and visual (image) (Haryoko, 2009) that would make students more enthusiastic in learning the reproductive system (Wibisono, 2011). In addition to the video, the experimental class also has the use of media such as mama card that emphasizes collaboration between students (Rosmala, 2015) with a couple looking concepts or topics while learning in an enjoyable atmosphere (Rohendi *et al.*, 2010).

Another factor that can affect the activity of students is students' interest towards learning factor (Mustikasari, 2012). According to the feedback, video and mama card can provide a clearer picture of the material so that students become enthusiastic and interested in learning. Moreover, it can be known from the questionnaire responses of students in the experimental class of studying the human reproductive system. According to the students, learning using video and mama card can make the students enjoy to learn the material on the human reproductive system. In addition, students become more active to interact with other students in learning. Results related to the activity of student responses to the use of video media and mama card on the human reproductive system materials shown in table 3.

Table 3 The Result of Students' Responses Related to Student Activities of The Use of Video and Mama Card in Human Reproductive System in MAN 1 Magelang

N	STATEMENT	PERCENTAGE(%)	INFORMATION
1	Students enjoy learning the material human	91.6	EXCELLENT
	reproductive system by using video and mama card		
2	Students feel in need of a friend to the discussion in	78.7	GOOD
	the videos and mama card		
3	Learning that used is making students more active in	78.7	GOOD
	class discussions and group		
4	Students can interact/collaborate with friends when	79.4	GOOD
	using video and mama card		
5	Students are motivated to seek and resolve the	81.3	EXCELLENT
	problems in SDS		

Based on the result of the students' responses related to the student activities in table 3 it can be seen that the students are an enthusiast for learning the human reproductive system. It can be seen that the highest percentage of student responses that students enjoy learning using video and mama card (91.6%). Students are also motivated to find and solve problems in SDS (81.3%). In addition to the results of the students' responses related to student activities can also be seen that the students become active in learning. It can be seen that students need a friend to the discussion (78.7%) and interact or collaborate with friends when using video and mama card (79.4%), making students more actively in class discussions and group (78.7%).

Student activities in the human reproductive system can affect learning outcomes. Student activities in learning are quite complex and varied (Djamarah & Bahri, 2008). With optimal learning activities, students can achieve optimal learning results (Sardiman, 2009). In the human reproductive system, students are stimulated to do activities such as listening, watching, reading, remembering and thinking. At the time of learning using video, students are stimulated to do activities such as listening, looking, remembering and thinking, while in learning to use mama card students are stimulated to do activities such as reading, considering and thinking (Hamalik, 2011). Therefore, learning using video and mama card stimulate students to perform the activity, video and mama card is a media that fits the needs of students in the human reproductive system (Ikasari, 2013).

Student learning outcomes in this research were obtained from the results of the pretest, posttest, tasks, and Students Discussions Sheet (SDS). The results of students in the experimental class and control class can be seen in Table 4.

Table 4 Students' Final Score in Human Reproductive System Learning using Video and Mama Card in MAN 1 Magelang

RANGE	EXPERIMENTAL CLASS	CONTROL CLASS
	Frequency	Frequency
1-19.9	0	0
20-39.9	0	0
40-59.9	0	0
60-79.9	27	28
80-100	4	2
Highest Value	83.4	73.2
Lowest Value	80.6	68.4
Average	77.34	72.77

Based on the results of the final score of the experimental and control classes in table 4, it is known that the experimental class has the higher average value than the control class. The average value of the experimental class is 77.34, while the control class is 72.77. The experimental class of 31 students contains five students who have a final score under KKM (minimum score criteria) so that 16.13% students must attend remedially. While in the control class of 30 students there are 21 students who have a final score under KKM so that 30% students follow remedially.

Differences between the results of the final score of the experimental class and a control class cause an accumulation of the value of the pretest, posttest, tasks and SDS which higher in the experimental class. To determine the difference in student learning outcomes between the experimental class and the control class can show by t-test. t-test student learning outcomes are shown in table 5 below.

Table 5 t-Test Results of Student Learning Outcomes

		\mathcal{O}							
	Levene's Test	for Equality	t-test for I	Equality of	Means				
	of Variances								
•	F	Sig.	T	Df	Sig.	(1-	Mean	Std.	Error
					tailed)		Difference	Differ	ence
Equal variances assumed	4.068	0.048	-4.689	59	0.000		0.048	-4.689	

 H_0 rejected if the value sig(1-Tailed) < 0.05

 H_0 accepted if the value sig(1-Tailed) > 0.05

Based on t-Test Results of Student Learning Outcomes in table 5 showed that value of student learning outcomes of the experimental class is higher than control class. It can be known from value sig (1-tailed) 0.000>0.005. Differences of student learning outcomes between experimental class and control class are caused by several factors such as the use of media video in the experimental class so that students can see and hear the video content so students will be more easy to understand and remember the human reproductive system material (Wibisono, 2011).

In addition to the video, the experimental class also has the use of media such as mama card which can make an entertaining presentation and make students do not feel like learning so that students can understand and explore the human reproductive system material in a fun way (Rosmala, 2015).

Differences in student learning outcomes between experimental class and control class also supported by a comparison of N-gain, presented in table 6.

Table 6 Measurement of N-gain towards the Learning Outcomes of Human Reproductive System with Video and Mama Card in MAN 1 Magelang

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		EXPERIMENTAL CLASS		CONTROL	CLASS		
CATEGORY	CRITERION	Number	%	Number	%		
g > 0.7	High	0	38.7	20	0		
$0.3 \le g \le 0.7$	Medium	12	61.3	10	33.3		
g < 0.3	Low	19	0	0	66.7		

Based on the results of the measurement of N-gain in table 6, the experimental class shows that 38.7% of students obtain the higher N-gain criterion, and 61.3% of students obtain the medium N-gain criterion, while the control class is 33.3% of students obtain medium N-gain criterion and 66.7% of students obtain low N-gain criterion. This proves the experimental class has increasing learning outcomes than the control class. The higher the value of N-gain, the better improvement student learning outcomes have (Fitriyani, 2011). Improvement of that learning outcomes can be stated that the treatment given to the experimental class has improved the learning outcomes.

To determine the difference between the result of pretest and posttest scores of students in experimental class and control class statistically, the results are presented in figure 1.

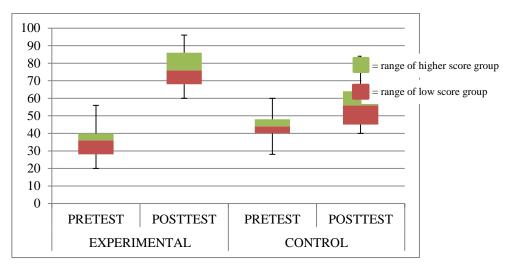


Figure 1 Diagram of the result of pretest and posttest in the experimental class and control class

Based on the pretest and posttest on figure'1 can be seen that there is an increase of the student learning outcomes of experimental class and control class seen from the posttest score that higher than the pretest scores. Although scores of both classes are increasing, the improvement from pretest to posttest scores in experimental class is higher than control class. It can be seen from the difference between pretest and posttest scores of an experimental class higher than the control class.

The result of the students assignment score combines with the task score summarizes and creates the scientific work. The student task scores are presented in table 7.

Table 7 A score of Students' Tasks in the Human Reproductive System with Video and Mama Card in MAN 1 Magelang

RANGE	EXPERIMENTAL CLASS	CONTROL CLASS
	Frequency	Frequency
1-19.9	0	0
20-39.9	0	0
40-59.9	0	0
60-79.9	0	1
80-100	31	29
Highest value	90	88.5
Lowest value	82	79.5
Average	87.645	84.867

Based on the score of students' task in the experimental class and control class, it shows that the average score of the experimental class is higher than the control class. Differences in the average scores of the experimental class and control class due to the experimental class students have a deeper understanding of the material than the control class. Understanding the material deeper is obtained through learning using video (Haryoko, 2009) because the video is a medium that can make learning process in the classroom become enthusiastic and students become more receptive to the material provided by the video (Hall & Wright, 2006)

Results of the score of Student Discussion Sheet (SDS) is a combination within a score of the structure and function of the reproductive organs SDS, reproductive organ tissue structure SDS, oogenesis and spermatogenesis process along with hormones that affect the process SDS. Results of students' SDS score are presented in Table 8.

Table 8 Students' SDS Score of Human Reproductive System Learning with Video and Mama Card in MAN 1 Magelang

RANGE	EXPERIMENTAL CLASS	CONTROL CLASS
	Frequency	Frequency
1-19.9	0	0
20-39.9	0	0
40-59.9	0	0
60-79.9	0	0
80-100	31	30
Highest value	100	100
Lower value	100	100
Average	100	100

Students' SDS score in the experimental class and control class is 100. This means that students can complete SDS well. Results related to the learning outcomes of student responses to the use of video media and mama card on the human reproductive system materials shown in table 9.

Table 9 The result of Students' Responses Related to Student Learning Outcomes of The Use of Video and Mama Card in Human Reproductive System in MAN 1 Magelang

STATEMENTS	PERCENTAGE (%)	INFORMATION
Learning process using video and mama card can	85.8	EXCELLENT
develop the capability and critical thinking skills for		
students		
Students can solve SDS well by video and mama card	83.9	EXCELLENT
Students become easier to understand human	83.9	EXCELLENT
reproductive system material through video and mama		
card		
Students gain concept/knowledge about human	94.2	EXCELLENT
reproductive system material		
Students can interpret material from video and mama	78.1	GOOD
1		
	Learning process using video and mama card can develop the capability and critical thinking skills for students Students can solve SDS well by video and mama card Students become easier to understand human reproductive system material through video and mama card Students gain concept/knowledge about human reproductive system material	Learning process using video and mama card can develop the capability and critical thinking skills for students Students can solve SDS well by video and mama card 83.9 Students become easier to understand human 83.9 reproductive system material through video and mama card Students gain concept/knowledge about human 94.2 reproductive system material Students can interpret material from video and mama 78.1

Based on the result of student's response related to student learning outcomes of the use of the video media and mama card shows that students can complete the SDS either using video and mama card (83.9%). Learning by using video and mama card students gain concept/knowledge about the human reproductive system (94.2%), were able to develop critical thinking skills (85.8%), easier to understand the material (83.9%) and is able to interpret the material in everyday life (78.1%).

Student learning outcomes indicate the extent of students are able to receive and understand the material. A series of assessments conducted during the study of human reproduction system measures how much material that can be absorbed by the students. Student learning outcomes reflect the flexibility, depth, complexity of the knowledge gained by the students and the results can be measured (Sugandi, 2007). The success of student learning can indicate the extent of students achieve learning goals in learning (Hakim, 2005). If the student learning outcomes are optimal, it can be said that the learning objectives achieved.

Media is one of the factors supporting the learning success. Students have a different way of learning. The more varied the media that used, the more students become acquainted with the learning materials. The important aspect of the use of the media is to help to clarify the message of

learning for information presented by the teacher verbally sometimes fully understood by the student (Susilana & Riyana, 2009).

Learning media is a way that can be used to accelerate the learning process. Students use more senses to learn so students who learn to use the media will remember for longer because the media makes the students use a variety of senses to learn. The sooner students catch learning materials faster the learning objectives achieved (Susilana & Riyana, 2009).

The use of video as a medium of learning will make students become more interested and enthusiastic about learning. In addition, by using the video students become active in learning because students are required to report what they had seen (Cakir, 2006). Through video, students will also be easier to understand the material. Students can see and listen to the content of the video so that students will be more easy to understand and remember. During the use of video appropriate to the topics presented, the video will facilitate teachers and students in learning so that learning objectives can be achieved (Wibisono, 2011).

Video can be utilized in the learning program because it can provide an unexpected experience to the students. The capability of video in visualizing the material is particularly effective to transfer dynamic material (Daryanto, 2011). According to Hall & Wright (2006), the video is useful in learning activities because discussions with the video can make a enjoyable learning and students can more easily understand the material. Moreover, it can help students to understand the process of human reproductive system material (Haryoko, 2009).

Mama card is media that are used in cooperative learning. Cooperative learning is included in active-collaborative learning where the emphasis on cooperation so that students are not only smart and active individually but also smart socially (Rosmala, 2015).

According to Suprijono (2010) in learning use make a match. The card is a learning use cards which it contains questions card and another card contains answers card about the human reproductive system. One of the advantages of mama card is students can find a pair of concept or topic while learning in an enjoyable atmosphere (Rohendi *et al*, 2010). This is in accordance with research conducted by Rosmala (2015) that learning using Mama cards entertained and learning fun, making students feel not like learning, can be alternative to understand and deepen the material and make students have passion and enthusiastically following the following research.

Using mama card in the study of the human reproductive system helps students to learn and can be used as a medium that is *edutainment* so that students are more interested to be more active in participating the learning activities. Students work together to find a partner among the questions and answers that fit within the card (Suprihatin, 2014) so that the interaction between students and they do exchange ideas to pair the appropriate card.

CONCLUSION

Based on the analysis and discussion that had been done, it can be concluded that the use of video and mama card on the human reproductive system of biology learning can improve student learning outcomes and student activities.

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