



## The Application of Quantum Learning Interactive Multimedia Assisted Learning Model towards the Student's Learning Outcomes in Animalia Material

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### Abstract

The observation was done to biology teachers and students in MAN 2 Semarang so that students have not experienced the difficulty of learning the Animalia material. The less of media and facilities make students' motivation low, so it impacts on learning outcomes. The classical completeness average of daily tests on the material value of invertebrates is less than 60% with a minimum completeness criteria (KKM) is 75. The model can be used in providing an understanding of Animalia matter is learning *Quantum Learning*. The *Quantum Learning* is learning to use a syntax TANDUR (Tandur/Grow, Alami/Natural, Namai/ Name, Demonstration/Demonstrate, Ulangi/Repeat, Rayakan/Celebrate). This research was conducted in MAN 2 Semarang with the research method used Pre-Experimental, One Shot Case Study. The research design used in this research is quantitative. The research steps include making proposals and instruments, testing trial and feasibility, instrument validation, application of learning method and end data processing. The results are cognitive and psychomotor learning outcomes. The cognitive learning outcomes showed the classical completeness of experimental class 95% and 90%, the average value of class X IPA 1 85 and 80. Psychomotor learning outcomes showed the experimental class average 82 and 81 with good criteria. Based on the data obtained indicates that the method applied is effective to maximize the learning outcomes. The learning outcome is effective when classical learning completeness reached  $\geq 75\%$  of the total and  $\geq 75\%$  for psychomotor aspect. Therefore, according to the results of this study, it can be concluded that the application of *Quantum Learning- assisted Interactive Multimedia* learning model towards student's learning outcomes in Animalia material on SMA / MA and teachers to give a positive response to the applied learning. Further, it can be implied that *Quantum Learning-assisted interactive multimedia* learning model effect on student learning outcomes.

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## INTRODUCTION

The curriculum improvement that occurred in 2013 is the reference to be able to utilize the information, media, information and communication technology (ICT) in teaching and learning in schools (Fadlilah, 2014). This is also supported by Permendikbud No. 22, 2016, which states that one of the principles of learning that is used is to utilize Information and Communication Technology (ICT) so that the efficiency and effectiveness of teaching in schools is increasing.

The Animalia material listed in the syllabus of learning high school in curriculum 2013, which is set in Permendikbud No. 59 2014. One of the basic competencies that must be achieved in the material that students can apply the principles of classification to classify animals into phyla based on the observation of anatomy and morphology, and hook the role in life.

The preliminary study through interviews with one of the teachers of biology on MAN 2 Semarang about Animalia material has a broad scope and many unfamiliar terms that make students have difficulties on learning Animalia material, the tendency of students who think that biology is a lesson to memorize becomes a problem in studying biology at MAN 2 Semarang. On the learning biology in the classroom, the teachers have not applied many variations of the learning model yet. As for the results of Animalia, student learning materials is still low. The minimum completeness criteria (KKM) for subjects of Biology class X MAN 2 Semarang is 75 while based on the data obtained by the value of daily tests for class X for Animalia material in the academic year 2016/2017 showed only <60% of students who pass the KKM.

The learning outcomes can also be influenced by the motivation to learn. The low learning outcomes can be caused by a low learning motivation. The results of frequently asked questions and a questionnaire with 32 students on MAN 2 Semarang, instructional media used by students not fully make students motivated to learn. The learning biology in the classroom in general use instructional media such as Student Worksheet, textbooks. However, during this time Student Worksheet (LKS) assessed the students still do not meet the learning needs of students. Compared with LKS interest of the students was higher against the media that is able to visualize well as interactive media such as animation or video, while learning the material Animalia biology teachers not yet fully optimize interactive learning media. Teachers simply use instructional media such as books, worksheets, and some preserved animals. So, expect in the form of interactive multimedia animations and images are expected to evoke the spirit and motivation to learn and help students learn the material of Animalia.

Learning biology can be effective not only supported by instructional media, however, learning strategies or models of student-centered learning with fun learning methods is necessary. One is the use of a learning model of Quantum Learning.

*Quantum Learning* is a form of learning that combines a fun learning method has not left meaningfulness in reaching the learning objectives. The media, as well as the learning model, plays an important role in the learning process of biology. This is supported by Minarti statement (2014) that the classroom atmosphere designed with quantum learning model-based learning using information technology in the form of a slide show media trying to create an atmosphere of learning becomes fun. The fun learning process can create a sense of comfort in learning. The student motivation can be raised by their interest in methods and media appropriate learning and interest so that students do not feel bored when the learning process. The media that are accompanied by music and animation strongly supports the creation of a fun learning environment, so as to facilitate the students to understand the material.

## RESEARCH METHOD

This study will be conducted in March 2018 at MAN 2 Semarang Bangetayu located at Jalan Raya, Semarang. In class X-1 and X IPA IPA-2 Semester Year 2018. The population in this study were students of class X MAN 2 Semarang IPA in subjects who took Biology at Animalia matter of five classes, totaling 239 students. Based on the results obtained purposive sampling as the sample class is class X IPA 1 and X IPA 2. The Class of X Science 1 totaling 42 students and X IPA 2 totaling 40 students. The total number of students is 82 people. Two sample classes are experimental classes. The selection of the sample with purposive sampling was selected based on the average grade is almost the same and the same teacher. The sources of the data include students and teachers of MAN 2 Semarang as a subject. The data is taken in the form of basic data and supporting data. The basic data is in the form of cognitive learning outcomes, and psychomotor. The supporting data is in the form of student feedback questionnaire, questionnaire responses observer on the learning process and teacher interviews. The data were analyzed by descriptive quantitative

## RESULTS AND DISCUSSION

### The results of cognitive Value

The cognitive learning outcomes are student learning outcomes related to aspects of students' knowledge. These students' cognitive value is the value of the posttest and Student Discussion Sheet.

**Table 1** Results of Students' Cognitive Domains On the Application of Quantum Learning Model Interactive Multimedia Learning Against Assisted Learning Outcomes at Animalia material in SMA / MA

Variation	X IPA -1	X IPA -2
The number of students	42	40
Average	84.62	79.67
The highest score	92.00	80
The lowest value	64.58	63.79
Number of students completed	40	36
The number of students does not complete	2	6

Based on the table above, it can be seen that the average value of cognitive science class X 1 at 84.62 and the average value of class X IPA 2 for 79.67. The value above is obtained from the value of the posttest and LDS, posttest value is the value obtained by students to work on the problems after learning implemented. Students who achieve a minimum value of 75 in the class X IPA 1 are 40 students from 42 students or 95% and in class X IPA 2 are 34 students from 40 students or 85% of students who did not complete the class X IPA 1 by 2 students and on class X IPA 2 by 6 students.

**Table 2** Psychomotor value on Animalia experimental class learning with Quantum Learning models

No.	aspects Psychomotor	IPA Class 1		IPA Class 2	
		Percentage	Criteria	Percentage	Criteria
1.	The ability to analyze data	63.2	Well	60.0	Pretty good
2.	The ability to make conclusions	96.7	Very good	100	Very good
3.	Accuracy in collecting duties	83.3	Very good	96.50	Very good
$\bar{X}$ end (%)		83.02	Very good	85.5	Excellent

The average value report obtained X IPA 2 class lower than the class X IPA 1. This affects the value of psychomotor students. The value of the affected student's psychomotor aspects of data analysis in the form of student assignment report. In the reports, there are three things that rated to the analysis of data, making inferences, and timeliness in collecting reports. Low student reports occurred in aspects of analyzing the data are less precise. It I caused by lack of researchers in providing instruction to students so that the students are less than the maximum in the process.

### Final Score Students

The final value is obtained from the assessment LDS students, post-test, and the value of the assignment in the form of the report.

**Table 3** Number of Students Based on the Final Score Criteria Level Five Students in Applied Learning.

Criteria Value End	The number of students (%)	
	X IPA 1	X IPA 2
Very good	7.14	5
Well	85.71	60
Enough	7.14	32.5
Less	0	0
Ugly	0	0

The final value is obtained from the assessment LDS students, post-test, and the value of the assignment in the form of the report. Recapitulation final grades of students in two classes studied are presented in. Based on the results of the final value of the fact there are still 2 of 42 students who have not completed the KKM for class X IPA -1 and 4 students from 40 classes of X IPA-2. According to the results of interviews with teachers of students in class X IPA 2 has the ability to receive readiness is lacking in learning biology. It is seen from some of the students' biology test scores before. From the observations of researchers, one of the differences between class X IPA 1 and X IPA 2 that is the character of students in the classroom. In X IPA 1, students tend to pay more attention when the teacher explains and students more enthusiastic in learning. In class X IPA 2 mostly students are not ready to follow the learning, and motivation in the process of learning so that the learning is not maximum, but the discussion has been relatively smooth. This affects the final value of learning outcomes which both have a difference of 2.05%, X IPA 1 is superior. The learning process greatly affects the outcome of learning. In addition, researchers are evaluating ourselves that lack of the ability to teach their own research and experience that is less than the old rules of thumb teacher who has taught at the school.

### Classical Completeness

The classical completeness of the data on both the class studied used as supporting data to assess the feasibility of the developed instructional design applied to future learning. The recapitulation of classical completeness in two classes studied showed that class X IPA 1 and class X IPA 2 reached the classical completeness, respectively for 97% and 90%. Thus the instructional design fit for use in future learning because it exceeds the criteria set out in this study ( $\geq 75\%$  of students achieve the Biological KKM subjects  $\geq 75$ ).

### Analysis Questionnaire Responses Students

The student response data is needed to determine the response of students to study with Quantum Learning-assisted learning model multimedia materials interactive on learning outcomes on Animalia in SMA / MA. This students' feedback is useful to know whether students feel happy, understand, interested in learning which is done or not. The data from student responses can be seen in Table 4.

**Table 4** The Analysis of Student Responses to the Quantum Learning aided interactive multimedia on Animalia in SMA / MA

No.	Grating	%	Criteria	%	Criteria
1	Interest in learning	91.2%	very good	80.35%	very good
2	Usefulness in learning	81.54%	very good	78.57%	very good
3	Learning motivating students for learning Animalia	83.92%	very good	76.19%	well
4	Pay attention to the teacher when relaying	86,31,7 4%	very good	78.57%	very good
5	Associating with the prior knowledge of the material presented	82.14%	well	80.95%	Very good
6	Getting a lot of fun learning experience	88.1 %	very good	83.92%	very good
7	Easy to understand the material	81.55%	very good	80.95%	
8	Was pleased to share ideas through discussion	88.1%	very good	80.95%	well
9	Being able to associate the concept of matter Animalia systems in everyday life	82.14%	very good	79.76%	Well
10	Managing information to draw conclusions	83.93%	Well	79.17%	well
11	Makes me feel happy to be able to communicate the results of the work.	86.31%		83.33%	
12	Trying to ask if there is an explanation that is less understood.	85.12%	very good		well
			well	85.12%	well
13	Were delighted when teachers use video, PPT, images.	88.69%	Very good	85.71%	well
14	Repetition of learning to make mind mapping/journal refers / summaries and summary strengthen the knowledge gained.	80.35%	well	85.12%	well
15	Awards received increasing motivation to do better.	86.31%	Very good	87.5%	Very good

The application of *Quantum Learning- assisted Interactive Multimedia* class for the six meetings by using the syntax "Tumbuhkan, Alami, Namai, Demonstration, Ulangi and Rayakan" (TANDUR). Teacher gives motivation to the stage of "grow" by doing a question and answer regarding the material can be found in daily life - day or conveys the benefits of learning about the material. Growing activity can cause students' motivation to learn more. According to Hamalik (2009) that the motivation arising from the student is able to direct the achievement of the overall objective of the learning process. The motivation can also be as a driver and encourage the students to study harder, the results of the responses stated 82.62% students pay attention to the teacher when delivering materials of Animalia and 86.9% gained motivation when following Animalia learning

The teachers at the stage of "Tumbuhkan" to apply the concept of "What is the benefit to me" (WIIFM) to deliver the benefits that would be obtained by students after receiving the Animalia material (Appendix 28). According to Roijackers (2008), he suggests that the lesson which begins with a good introduction will increase the students' attention. A good introduction will be in the form of

descriptions are intended as a link between the current teaching materials with contemporary news, which is already known by most students, so motivating the students as well as paying attention to the material that will be delivered. Based on the results of the responses, 82, 96% of students were able to link the knowledge beginning with the submitted materials

Students at the stage of "Alami" learning experience gained through the activities to observe, ask and explore. Exploration activities carried out by seeking information from various sources to work on the problems that are Sheet Discussion Students (LDS) (Annex 3, 5,7, and 9). This exploration is assisted with interactive multimedia such as Flash which contains materials about learning Animalia. According to Sabu (2018) in his research towards learning with interactive multimedia on nutrient content claim that interactive multimedia is able to increase higher order thinking skills, especially in classification skills as well as skills to compare among high school biology students. The use of interactive multimedia makes students feel more pleasure in understanding the material. This is supported by the statement of students say that 81.76% of students are able to associate the initial knowledge with the submitted materials

The students at the stage of "Namai" discuss the information obtained to answer questions on LDS Troubleshooting is done by the discussion that allows students to exchange ideas and understand the answers that have been found (Widodo & Kardawati, 2013). According to Pristiwanto (2013), the discussion method aims to develop the ability to think independently to solve problems and train students to be brave in arguing about an issue. The results of student responses showed 81.74% of the students are happy to share ideas through discussion.

The average value report obtained on X IPA 2 class lower than the class X IPA 1. The students communicate or present the results of LDS discussion on the stage of "demonstrating" (Appendix 6). This stage gives students the opportunity to demonstrate his abilities in learning activities such as answering questions, ask questions and give opinions or responses (Aka, 2016). These activities encourage the exchange of information and the emergence of inter-group communications so that the transfer of knowledge more and 86.9% of students are happy to be able to communicate it and 87.25% tried to ask if there is an explanation that is less understood. Students who feel good in communicating the work to the creation of a positive climate in the learning process. The creation of a positive climate can be an effective form of communication so that the subject matter can be easily understood students and creates a positive feedback by students, (Huda 2011).

Teachers at the stage of "Ulangi" give a repetition of material with the aim of increasing the understanding of students because of the materials provided allow for repeated and all of them can be absorbed (A'la, 2012). The teachers do repetitions with the help of interactive multimedia include images, video, and animations. The results of student responses showed that 89.36% of students are happy when teachers convey information using video and pictures or animations. Students who had the pleasure caused in the multimedia components contained in the form of combat, video or animation that can hold the attention of students (Astatine & Nurcahyo, 2016)

The phase of "Ulangi" is also done by students by making mind mapping outside class hours (Appendix 17). According to Nyna, *et al*, (2013), the learning method Quantum Learning to use a mind mapping can improve comprehension, creative thinking through ideas through writing into a map or chart making it easier to remember and understand the material. The study also corroborated by Tirtawati, *et al*, (2014) mind mapping or mind maps have great benefits is that it can be an easy note that is easy to learn by students because they make it with style and art students themselves, So it is great for students to relearn. Based on the responses of 83.98% of students expressed repetition of learning by making mind mapping strengthen the knowledge gained.

The teachers at the stage of "Rayakan" gave awards to students or the best group in the hopes of improving student motivation. The results of student responses stated that 89.1% Of students received awards argues that it increases the motivation to do better. This is in accordance with the

opinion of Damayanti (2015) that some forms and ways to motivate their school activities, among others with the reward, value, reward, and praise. The learning activities in the classroom in celebrated stage researchers give praise, value, and reward. Giving the exam is a form of positive reinforcement and is a good motivation. The right compliment will foster a pleasant atmosphere and heightens arousal learn and will raise their self-esteem. Giving gifts can also motivate students, (Sardiman, 2011).

Application of *Quantum Learning- assisted Interactive Multimedia* to provide a lot of learning experiences through the syntax "TANDUR". The results of the responses stated that 88.16% of students gain a lot of fun learning experience, 83.28% of students understand the material easily on Animalia.

### Response Results of Teachers

The response of teachers in teaching and learning of Animalia material using *Quantum Learning- assisted Interactive Multimedia*.

**Table 5** Results Summary of Teacher Responses of the application of Quantum Learning teaching model-assisted interactive multimedia.

No.	Principal Questions	Summary of Teacher Responses
1.	Impression toward learning	Give a good impression, because the design of applied learning is able to optimize student learning outcomes and student learning activity is also very good
2.	Student activity	Students are actively involved in the discussions and presentations and more digging his knowledge independently
3.	excess design	Learning more organized, learning more meaningful for students and motivate students to argue.
4.	design flaws	Students will busy themselves if not monitored properly then extra
5.	Suggestion	scrutiny to run conducive Learning in preparing better and better supervision of students to be increased.

The data of teacher interview result shows that from the five aspects in question, the teacher said that learning has been applied to optimize the activity and student learning outcomes. Teachers stated that learning can motivate students to be more active in the learning process. The teacher gives advice for learning remain always under the supervision of teachers despite freeing fit what students liked.

Based on the information of the teacher-subjects of Biology says that the average value of learning results daily test students on the material Animalia before using model study of Quantum Learning-assisted interactive multimedia is less than 60 % who graduated KKM. This is in contrast with the average value of learning outcomes cognitive students through learning activities using Quantum learning-assisted learning model of the interactive multimedia.

The use of multimedia is used as a medium to make the students get information about the knowledge that wants to get. Read the information from the media student has attempted to implement literacy activities. Nopilda & Kristiawan (2018) states that multiliterate activities, as well as reading media literacy (Literacy Media), can increase students' interest cultivate students' interest, also can cultivate character, creativity and innovati as well as making skills while enhancing the achievement of copyrighted works. The students in the learning process seek to process the information and concluded the information and pass the results through discussion after reading literacy through learning resources by using these learning media. The total of 80.23% of Quantum Learning-assisted learning interactive multimedia makes the students rejected and concluded with good information

## CONCLUSION

Based on these results, it can be concluded that the application of the results of student learning material on the body's defense system on SMA effectively optimizes both cognitive and psychomotor of students. This is evidenced from the cognitive classical completeness has reached  $\geq 75\%$  of the total number of students in the classroom and to the achievement of the psychomotor have achieved  $\geq 75\%$ .

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