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The Influence of Somatic, Audio, Visual Learning Models, Intellectual (SAVI) Rock PhET Against Students' Activities and Learning Outcomes

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Abstract: The SAVI learning model combines four learning styles, for example *visual* (understanding everyday life phenomena through modules), *somatic* (collecting data), *intellectual* (solving problems), *Auditory* (communicating observations in front of the class). The purpose of this study was to determine the effect of the *PhET-Assisted Somatic, Audio, Visual, Intellectual Learning Model* (SAVI) on Students ' Activities and Learning Outcomes. This study uses a *Quasi Experimental Design*, the design used is the *Nonequivalent Control Group Design* . Sampling using *probability sampling technique* , then, the type used in this study is *simple random sampling*. So that we get class XI IPA 1 as the experimental class and class XI IPA 2 as the control class. Student activity measured by observation for the two classes experienced a fairly far comparison, the average control class activity was 69.72 while the experimental class was 78.88. For the analysis of student learning outcomes , $t_{count\ is}$ 3.01, with t_{table} 2.81, which means $t_{count} > t_{table}$, the conclusion is $H_{0\ is}$ rejected and H_{1} is accepted which means there is an influence of *Somatic, Audio, Visual, Intellectual Learning Models* (SAVI) *PhET Assisted* on Activities and Learning Outcomes.

Keywords: SAVI, *PhET Simulation* , Activity, Learning Outcomes

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INTRODUCTION

According to the National Law no. 20 of 2003 concerning the National Education System states that education functions to develop capabilities and shape the character and civilization of a dignified nation in the context of educating the nation's life, aiming to develop the potential of students to become human beings who believe and fear God Almighty, have noble character, are healthy. , knowledgeable, capable, creative, independent, and become a democratic and responsible citizen. The government's efforts to realize the educational goals stated in the Law above, education can be achieved through three educational channels, namely formal, non-formal and informal education. Formal education in Elementary School, Junior High School, High School, and College.

Physics is one of the subjects of the Mathematics and Natural Sciences (MIPA) specialization group in the 2013 curriculum given in high school (SMA). Physics as a science has developed since the early 14th century. Physics together with biology, chemistry, and astronomy are included in the group of *natural sciences* or briefly called *science* . *Science* is knowledge obtained by using methods based on observation. According to Trianto (in Alfiyani, 2015) Learning is a two-way interaction between teachers and students. How to teach a good teacher is the key and prerequisite for students to be able to learn well. The condition of students and teachers will determine the success of the learning process.

Based on the description above, physics learning can be interpreted as a teaching and learning process that studies natural phenomena and events with the aim of acquiring knowledge, skills, changes in attitudes, and emotions that are developed through learning experiences.

Based on the results of interviews that have been carried out by researchers at SMA Muhammadiyah 1 Palembang, it shows that, 1) teachers still use the lecture method; 2) lack of use of school facilities and infrastructure; 3) students do not participate in the investigation of knowledge; 4) students still find it difficult to understand and master the concept of Physics; 5) and the ineffectiveness of online learning.

Along with current technological developments, many experts are trying to develop various learning media, one of which is PhET simulation. Simulation *Physics Education Technology* (*PhET*) is an interactive simulation on the internet using the *Java* and *Flash programming languages* , which was developed by a team from the University of Colorado, United States. *PhET* has developed a series of interactive simulations that are very beneficial in integrating computer technology into learning (Perkins et al, 2006).

Due to the availability of inadequate laboratory equipment and *online learning as it is today, the researchers introduced PhET* simulation media in which PhET emphasizes the relationship between real-life phenomena and underlying science, supports an interactive and constructive approach, provides feedback, and provides a workplace. *The advantage of PhET* simulation is that it can ideally carry out experiments, which cannot be done using real tools.

In this study, we combine the SAVI learning model with the PhET learning media, which is known that learning is still done online. by using PhET learning media students can carry out demonstrations independently and also researchers have provided videos about tutorials using Phet simulations.

METHOD

Based on the problems that have been stated previously, this type of research is quantitative research. This study uses a *Quasi Experimental Design* where this design has an experimental class and a control class. The sampling technique used is probability sampling by using probability sampling educators provide equal opportunities for the population to be

sampled. Then, the type used in this research is simple random sampling. The target population in this study were students of class XI MIPA 1 and XI MIPA 2 at SMA Muhammadiyah 1 Palembang.

In general, the procedure of this research can be divided into three, namely: 1) the preparation stage; 2) implementation stage; 3) final stage. Analysis of the experimental class and control class was conducted to test the truth of the hypothesis proposed in the study. the point is to see whether the average difference in the final test results between the experimental class and the control class is significant or not. In the analysis and processing technique of learning outcomes, the data used are data on learning outcomes in the cognitive, affective and psychomotor domains.

RESULT AND DISCUSSION

The results of this study are answers to predefined problem formulations that can strengthen a hypothesis or previous provisional answer. Analysis of student learning outcomes was obtained from the pretest and posttest instrument questions with 8 essay questions for each that had been adjusted for learning outcomes indicators. It has been mentioned that there are three research procedures, the first is the preparation stage, carrying out school observations, in this observation the researcher collects data related to learning activities at the research location, the researcher interviews physics teachers and students. Next, the researchers prepared by reading books, articles, journals, and other writings related to "The Effect of PhET -assisted Somatic, Audio, Visual, and Intellectual Learning Model (SAVI) on learning activities and outcomes". Then the researchers made a research design by determining the sample. , making learning tools, teaching materials, research instruments, and others before going to the field.

The instruments in this research are test techniques and non-test techniques where the test techniques used are Pre-test and Posttest , while the non - test techniques used are observation of student activities during learning, student response questionnaires after the PhET Assisted SAVI learning model is implemented , and interviews. The main discussion of the interviewees is the learning model used in schools, the use of facilities and infrastructure, and the involvement of students in the investigation of knowledge.

The two stages of implementation, At this implementation stage, researchers go directly to the field by carrying out what has been planned, giving treatment to the experimental class with the Somatic, Audio, Visual, and Intellectual (SAVI) learning model assisted by PhET and the control class with the Somatic model, Audio, Visual and Intellectual (SAVI) .

The final three stages, the results of this study are the results of the pretest and posttest of students, the data of these results are used as a description of the learning outcomes of students before and after the implementation of the learning model. The following is the data from the pretest and posttest results for students in class XI IPA 1 and XI IPA 2.

Table 1. The Average Results of Students ' Pretest-Posttest Scores

Class	Mark	Average Learning Outcomes
XI IPA 1 (experimental class)	Pretest	45.29
	Posttest	78.16
XI IPA 2 (control class)	Pretest	42
	Posttest	68.7

Based on the table above, it can be seen that the results of class XI IPA 1 are higher than those of class XI IPA 2. Students' learning mastery is obtained from the *posttest scores* in the experimental class. *The following is the completeness data of posttest* learning outcomes in the experimental class and the control class.

Table 2. Completeness data on posttest learning outcomes for the experimental class and the control class.

Class	Value Range	Number of Students	Category
Experiment Class	0-69	3	Not Complete
	70-100	21	Complete
Control Class	0-69	12	Not Complete
	70-100	12	Complete

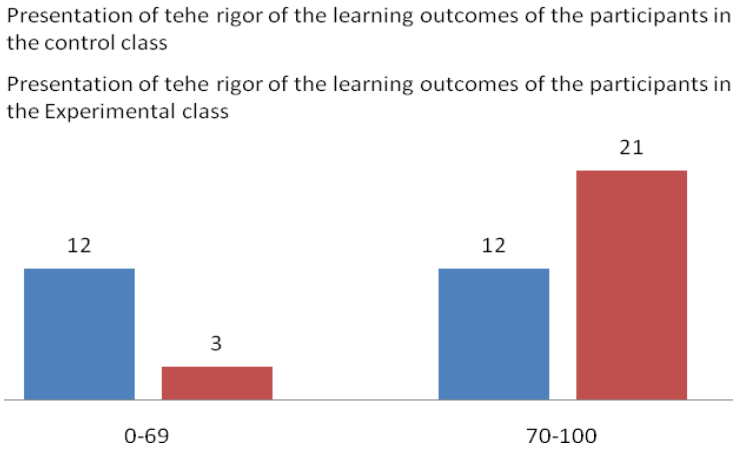

Figure 1. Graph of The Presentation of Student Learning Outcomes Completeness

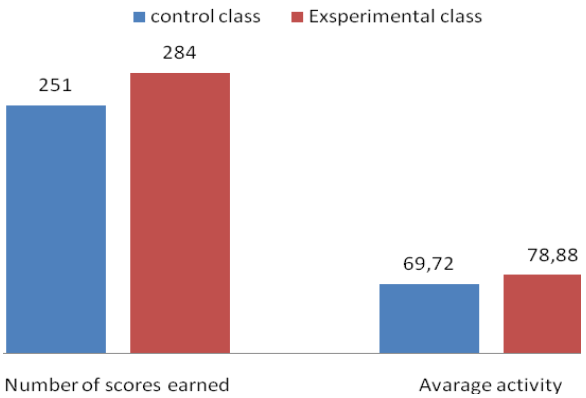

Figure 2. Graph of The Student activities:

The following are the results of researchers' observations on student activities, based on the graph above, it can be concluded that the activity of students increased during the learning process. At the first meeting and the second meeting for the control class, the total score was

251 with an average of 69.71 (quite active) and in the experimental class it was obtained 284 with an average of 78.88 (active).

***Somatic, Audio, Visual, Intellectual* (SAVI) learning model assisted by *PhET* for student activities.**

The PhET -assisted SAVI Learning Model is applied in physics learning because it has been able to increase the active participation of students, especially in an effort to gain new experiences through direct involvement of students in simulation activities. This is as stated by Meier (2002) that learning with the SAVI Model is able to arouse students' creativity and improve students' psychomotor abilities.

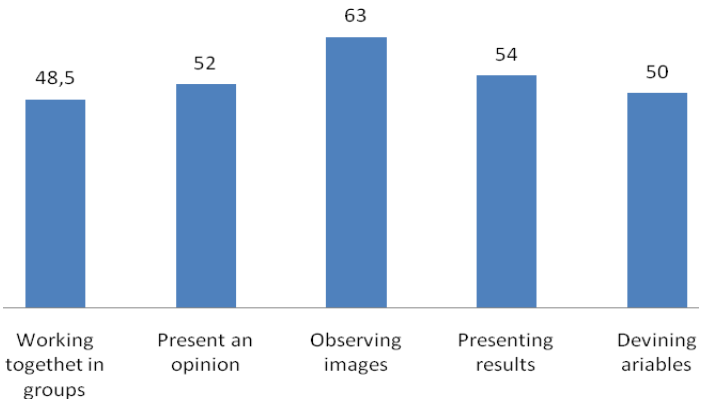

Figure 3. Graph of The Results of The Average Observation of Student Activities

The results of the observation of the analysis of the average activity of students during physics learning in the experimental class and control class can be seen in graph table 3 shows that an average of five activities observed, the average result of activity is working together in groups of 48.5, expressing opinions 52, observing pictures 63, presenting the results of group discussions 54, determining variables, analyzing data, working on *post-test questions* 50. At the time of observation, observing pictures and observing experiments (*visual activities*) is the highest while the lowest activity is determining variables, analyzing data, working on *post-test* questions (*mental activities*)

This is because students do not understand and rarely do experiments in learning physics. In addition, to formulate hypotheses before conducting experiments, adequate learning resources are needed, as well as the lack of use of existing learning media in the current era, which is known that at this time learning is carried out online so that students and educators only use textbooks and worksheets, as well as the lack of being able to take advantage of existing technology.

***Somatic, Audio, Visual, Intellectual* (SAVI) learning model assisted by *PhET* on student learning outcomes.**

The learning outcomes assessed in this study were the cognitive aspects obtained from the post-test scores. It can be seen from picture graph 3 in the experimental class that there is an increase in learning outcomes of 72.57%, while the increase in learning outcomes in the control class is an average of 63.57%.

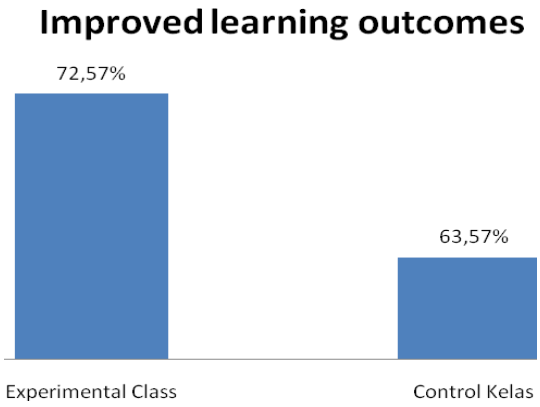

Figure 4. Graph of The Improvement in Learning Outcomes in The Experimental Class and Control Class

Based on the statements given by students by filling out questionnaires, it shows that after learning is carried out it is positive because it can lead to good cooperation between students, students are required to be actively involved in learning to make it easier to understand. physics concepts taught. In addition, students said they were happy because the PhET simulation, group discussions and presentations made them not feel bored in taking physics lessons.

The application of the PhET-assisted SAVI learning model in physics learning can make students more active so that the learning outcomes obtained by students are also better. The use of the PhET-assisted SAVI learning model is proven to make students feel happy and not bored, more enthusiastic, active and able to increase student activity during learning and also affect student learning outcomes. By using the PhET-assisted SAVI learning model, students' ability to remember the material they have learned is better than before because students are directly involved in learning.

CONCLUSION

Based on the results of data analysis, the effect of the PhET -assisted SAVI learning model on the activities and learning outcomes of physics at SMA Muhammadiyah 1 Palembang, it can be concluded that the results of the analysis of student learning outcomes t count , amounting to 3.01, with t table 2.81, meaning t count > t table , the conclusion is that H 0 is rejected and H 1 is accepted which means there is an Influence of PhET Assisted Somatic, Audio, Visual, Intellectual Learning Model (SAVI) on Activities and Learning Outcomes.

SUGGESTION

Some suggestions are proposed as follows Learning using the PhET-assisted SAVI learning model should be an alternative for teachers to be applied in classroom learning, and to apply learning using the PhET-assisted SAVI learning model on a subject, you should consider whether or not the learning is suitable for the subject to be taught in order to minimize time.

REFERENCES

Arikunto, S.2010. Research ProceduresA Practical Approach. Jakarta: Rineka Cipta.

Alfiyani, R (2015). The effect of the SAVI (Somatic, Auditory, Visual, Intellectually) approach with the experimental method on learning outcomes and student learning activities in physics subjects at MAN.

Ministry of National Education. 2003. Law on the National Education System (UUSP N No. 20 of 2003. Jakarta: Ministry of National Education.

Ministry of National Education. (2008). Module Writing. Jakarta: Directorate General of PMPTK

Faudila, N., Suastra, IW, & Sujanem Rai (2017). Application of Discovery Learning Model Assisted with Interactive Quiz to Improve Physics Learning Achievement of Class X BKP State Vocational High School Students. Journal of Physics Education Undiksha, Vol. 7 No.2 Year 2017 (ISSN. 2599-2554)

Finkelstein, Adams, Keller, Perkins, and Wieman. 2006. Hightech Tools For Teaching Physics: The Physics Education Technology Project. MerlotJournal of Online Learning and Teaching. Vol. 2(3): 110-121.

Fitriani, S, L,. et al (2016). The Use of Phet Simulation Media With Guided Inquiry Approach To Improve Students' Critical Thinking Skills On The Subject Of Heat At Sma Negeri 12 Banda Aceh. Indonesian Journal of Science Education, Vol. 04, No.02, Hlm 45-52, 2016. Http://Jurnal.Unsyiah.Ac.Id/Jpsi

Jauhari, T., Etc. (2016) The Effect of Phet-Assisted Problem-Based Learning Model on Physics Learning Outcomes of Class X SMAN Gunungsari School Year 2015/2016. Journal of Physics and Technology Education (ISSN. 2407-6902). 2(1): 1-6.

Meier, Dave. 2002. The Accelerated Learning Handbook (Creative and Effective Guide to Designing Education and Training Programs. Bandung: Mizan Media Utama.

Mulyani, T. (2010). Application of Joyful Learning-Based Learning Variations to Improve the Quality of Student Learning Process and Outcomes: Classroom Action Research at SMA Muhammadiyah 1 Surakarta. Unpublished Thesis, Sebelas Maret University, Surakarta

Natalia, S,. (2018) the effect of applying PhET simulation on improving student learning outcomes in class XI IPA SMA Negeri 1 Ngemplak on light refraction based on Bloom's Theory: Yogyakarta, 2018

Novitayani, L., Etc. (2016) Development of Somatic, Auditory, Visual, Intellectual (Savi)-Based Physics Modules to Increase Learning Creativity of Class X High School Students With the Topic of Heat and Its Transfer. Journal of Inquiry (ISSN): 2252-7893, Vol 5, No. 2, 2016 (Pages 20-29)

Nurmalia, Dkk. The Effectiveness of the Application of Somatic, Audiotory, Visualization, Intellectully (Savi) Learning Models on Increasing Students' Critical Thinking Ability in Science Subjects. Edutcehnologia, Year 3, Vol 3 No. 2, August 2017.

Rusman. (2015). Integrated Thematic Learning: Theory, Practice and Assessment. Jakarta: PT RajaGrafindo Persada.

Sasmita, P, R,. (2017). Application of Guided Inquiry Method Using Physics Kit Media Efforts to Improve Students' Physics Activities and Learning Outcomes. Al-Biruni Scientific Journal of Physics Education, 06 (1) (2017) 95-102. (P-ISSN: 2303-1832)

Sugiyono (2008) Educational Research Methods Quantitative, Qualitative, and R&D Approaches Bandung: Alphabeta

Sudjana, N. 1989. Assessment of Teaching and Learning Outcomes. Bandung: Youth Rosda Karya.

Sudjana, N. 2005. Statistical Methods. Bandung: Tarsito.

Sumargo, E,. & Yuanita, L,. (2014) Application of Virtual Laboratory Media (Phet) on Reaction Rate Material with Direct Teaching Model. Unesa Journal Of Chemical Education Vol.3, No. 1, PP. 119-133, January 2014

Sunni, MA, Wartono, and Diantoro, M. 2014. The Effect of PhET-Assisted Problem Solving Learning on Mastery of Physics Concepts and Critical Thinking Ability of High School Students. Malang : Post Graduate MPIPA State University of Malang.

Perkins, et al. 2006. PhET: Interactive Simulations for Teaching and Learning Physics. Journal of The Physics Teacher. Vol. 44

Yulianti, S., et al (2018). Application of Video Media in the SAVI (Somatic, Audio, Visual and Intellectual) Learning Model on Student Learning Outcomes in Physics Subjects Class X1 IPA at SMA N 1 Rambatan. National Seminar on Mathematics and Science Education, IAIN Batusangkar. 21st Century Skills; Learning Development Strategy, Research, Mathematics and Science. 21 July 2018