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EFFECT SIZE OF MODEL APPLICATION *REACT* ON PHYSICS STUDENT'S ACHIEVEMENT

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ABSTRACT

Implementation of the in realizing learning objectives must be student-centered (active learning). The reality in the field, learning Physics in class X Mathematics and Natural Sains shows that the teacher still takes a direct approach and does not involve students in the learning process, so that students lack participation in learning which results in low learning outcomes. To overcome that, researchers use learning models *REACT*. This study aims to determine the effect of applying the model *REACT* on the physics learning outcomes of Class X MIPA students. This type of research is quasi-experimental research (*Quasi Experimental Design*). The research design used*Post-test Only Control Design*. The research population is students of class X Mathematics and Natural Sains in Senior High School. The research sample was taken using the technique*Cluster Random Sampling*. The data collection instrument used was a test instrument. The data analysis technique used is descriptive statistical analysis, normality test, homogeneity test, and t-test. From the research results, the average final test result for the experimental class was 81 and the control class was 76.52. Based on calculations from the t test for a significance level of 0.05, the value is obtained t count = 2.127 greater than t table = 1.688. It can be concluded that using the *REACT* learning model impacts student learning outcomes more than not using the *REACT* learning model or the Discovery Learning learning model used in the Momentum, Impulse, and Simple Harmonic Vibration materials.

Keywords :REACT models; learning outcomes

I. INTRODUCTION

Education is a relationship between educators and students who interact with each other in order to achieve educational goals and play a role in the educational environment. Educational interactions help advancing and building all the skills and attributes of the participantpotential learner. Those features among othersmovement, intelligence,learning styles, social development, emotional development, moral development and spiritual [1].

Along the time, world of education toowillforced tofix, make education even better and make sure not lagging behind other countriesinitially lagging progress[2]. On moment this, world already entering the 21st century, and Century 21 is saidas the century of openness and globalization century. 21st century skills include life and work skills, learning and innovation skills and information skills, media and technology [3].

In this world education, that curriculum happen at school studied for findapproach to break educational problems [4]. For increas equality educationin the homeland, government make curriculum changes with apply 2013 curriculum. Application The revised 2013 curriculum requires teachers to develop learning through cohesiveness four main pillars. Wrong only one is a skill for 21st century technology, but we need to push learning active which is centered on student and develop skill swhich needed for 21st century [5].

Based on the initial observations of researchers at SMAN 1 Rao, found that participation student still in class relatively low. In the process learning, teacherd the learning process according to the model learning that given as discussion while learning, cooperation in the shape of group. However, Thing this is far from optimal and effective and process learning tends passive. As a result ofstudent passivity, results study students become less optimal and

learning objectives that have been setpreviously not reached.

To solve the problemon, need to be determined or selected which model corresponding. One of the models theis a learning model *REACT*. Learning model *REACT* is a model connect problems that exist in lifeeveryday life and apply contextual learning so that student could live experience and feel itin his life. Direct experience this then combined with experience before to create new concepts and understandings realistic and relevant. The REACT strategy is the development of the contextual learning approach or Contextual Teaching and Learning (CTL). It is a learning approach that involved students in full to connected the material study with real-life contexts so that the knowledge is obtained by students is more meaningful [6].

The process of implementing learning by using a learning model *REACT* is a cycle which activities continuous. In other words, the process is never interrupted. Learning started with Relating stages, this is learning based on knowledge and experience obtained previously. Experience, that is learning goes through research activity, experimentation, orobservation. Applying, namely application concepts foundin trouble. Cooperating, that is learn through activity together, exchange thought, communicate with another student, and transferring, that is contextualize what isstudied, namely learningin a new context from previous observations [7].

Learning model *REACT* includes depthunder standing students, give opportunity to student for participate active in the learning process, develop feel togetherness and belonging advancing skills for the future,and growfeellove. Create environment and make it learning inclusive. Based on this description, this study discusses "The Influence of Model Application *REACT* Against the Learning Outcomes of Class X Semester 2 Students of SMAN 1 RAO Pasaman Regency.

II. METHOD

This research is an experimental research with a research designquasi experiment usinggroupcontrol.This group is notcould control for all irrelevant variables that can affect implementation experimental study. The only study designwhich is used ispost-test control design. The research design can be seen in Table 1.

Table 1. Research Guidelines*Design Control Posttest*

Group	Treatment	Postest
Eksperiment	X	O_1
Control	-	O_2

Source:[8]

The population of this research is students Class X MIPA registered at SMAN 1 RAO, Pasaman Regency academic year 2021/2022. There are 215 students in6 MIPA class. Sampling technique stargeted which is used in this research find relatively comparable end-of-semester average scoresbased on the domain in women physics lessons in classes taught by the same educator and in classes taught by different educatorssame. Exists analysis showsthat class X MIPA 1 and X MIPA 4 are classessample.

The abilities measured in this studybased knowledge. This aspect of knowledge is measured by using research tools in the form of multiple choice questions developed and analyzed by researchers. The instrument was tested for validity, reliability,different power,and the difficulty of the question.

Tice consists of 20 about with 5 alternative choice answer. Aspects of knowledge that are measured relate to momentum, impulse, and vibration harmonic simple with use some indicator which corresponding with research material already prepared.

This researchdone in 6 sessions. Learning process going on for five session face to face which aims to dominat elearning materials Momentum, Impulse and Simple Harmonic Vibration. The research activity ends with a final test (posttest) which aims to determine students' abilities in studying physics after learn model *REACT*.

Research data analysis was carried out to support the hypothesis proposed to testyield increase learn physics measurable. Achievement of research results were analyzed statistically with test post-test scores student in the experimental class and control class. The test in the form of a normality test, test homogeneity, and equality test of two means with statistics form t-test Level significance (α) usedin testing this hypothesisis 0.05.

III. RESULTS AND DISCUSSION

Data on the ability of students' physics learning outcomes obtained from the post-test scores between the experimental class and the control class are presented in table 2.

Table 2. Data on physics PE post-test abilitiess also educate

CLASS	N	LOWEST SCORE	HIGHEST SCORE	$\bar{X}$	S	S^2
Eksperiment	35	35	50	81	8.87	78.71
Control	36	25	40	76,52	9.13	83.38

Based on data on Table 2, we know that the average of the experimental classis 81 and average control classis 76,52. After work done on class examplein the form of a learning model reactive and models discovery learning, revealed differences in physics learning out comes significant student between the two class the.

Statistical Test of Students' Physics Learning Outcomes Ability

One of the characteristics of quantitative research is statistical data validation. Data statistics tested with the aim of analyzing research data so that later it can bedirect researc hers to find janswer from the formulation of the problem in research as well as to test the hypothesis of the research that filed. Seriess tatistic test performed on data obtained from the experimental and control classes before testing the hypothesis. Analysis statistical test data proficiency Physics learning outcomes are presented in Table 3.

Table 3. Analysis Test Results Stat Characteristics of the Experimental Class and Control Class

No.	Tested	Test Type	Results	Table	Conclusion
1	Normality	Test Lilliefors	0,097 and 0,140	0,149 and 0,147	Normal Data
2	Homogeneity	Test F	1,41	1,84	Homogeneus Data
3	Similarity of the means	Test t	2,127	1,668	Result are not the same (there is influence)

Referring to the results of the experimental class value analysis and class control shown in Table 3, normality of the data tested with test Lilliefors found show level significance 0,097 for class experiment and control. Both of them smaller than valuel table andf table. From here we could conclude that data distributed normal. Where ason data homogeneity test,whene xperimental class learning out comes and control class physically tested with test F is obtained significance level 1,41, which is smaller than F table 1.84. There fore, we conclude that data have the same variability for the data forhomogeneous population orforeachsample.

Data analyzed regularly normal distributed and from the population homogeneous and class sample. Test the similarity of the two ways thenanalyzedusing the t-test. From Table4, we can see that the significance level is 2.127, and H_1 accepted because score level no significance with in the tolerance range H_0. Result stestingThis shows that the results of learning physics not the same for learning model which different. It shows impactwhichsignificant oneffect application of models *REACT* student physics learning out comes Class X Mathematics and Natural Science Semester 2 Public High School 1 RAO Pasaman. Given the average post-test experimental class is more big from the average post-test control class, then the *REACT* learning model can improve results learn physics students in terms of momentum, impulses and simple harmonic vibrations.

Application of models *REACT* not only affects the learning out comes of students in general, but also affects the activities of students while participating in class learning. When learning using models *REACT* students seem to be more trying to understand the material being studied in order to be able to connect between the concepts being studied and the knowledge they have in everyday life. At stages *relating* students are expected to be able to build and find the information obtained so that students have concepts that will be deepened in the stages *experiencing*.

Stages *experiencing* or the group work phase is the stage that is carried out after students have the concept of initial knowledge individually. *Experiencing* is a learning strategy through exploration, discovery and creation [9]. In this group work phase students will convey the knowledge they already have to complete the worksheets that have been distributed. At stages *Applying* learning that is carried out by applying or applying the concepts or information obtained when carrying out problem-solving activities, either through worksheets, assignment exercises, or other activities that involve students being active in learning.

Cooperative learning is carried out in the context of giving each other input, responding and communicating in problem solving [7]. Then on stage *cooperating* students who have sat in groups earlier are asked to be able to solve the problems contained in the student worksheets by working together or in discussion and students are asked to search from various sources regarding the material being studied, so that students are required to have the responsibility to understand and associate information obtained, at this stage the researcher also guides students who do not understand in solving the problems contained in the student worksheets. With the cooperation stage, students are given the opportunity to think about solving a problem together and collaborating with peers or being able to transfer their knowledge in the form of small groups, social interaction communication, so that all students can be active in learning. Students who carry out learning activities individually are usually unable to show significant development compared to students together or in groups in solving problems [10]. This is in line with research that science process skills are related to cognitive development and skills development can help students' way of thinking in solving problems, expressing reasons and making students creative [11].

The last stage is *transferring*. After the groups agree to determine the answers from the worksheet, each group will display the answers they have obtained in front of the class. Groups that have relatively different answers will represent the answers in front of the class and other groups will respond to the results described. So at this stage the advantages of the model can be seen *REACT* it self. Where students who initially lack confidence in the answers that have been obtained will feel more confident if the answers obtained are an agreement in groups. After each group appeared for the presentation, at the end of the lesson the researcher gave the opportunity to the students to provide conclusions on the material being studied, and then the researcher also reinforced the conclusions presented by the students. And this was also said that the talk in the discussion might be dominated by students who are brave and are used to speaking [12]. With the discussion method the courage and creativity of students in expressing ideas becomes aroused, students exchange ideas with friends, respect and accept the opinions of others and more importantly through discussion they will learn to be responsible for the results of shared thinking.

In line with the results obtained in Ririn Zaharbiah's research which said that learning *REACT* proven effective in increasing student achievement in the cognitive and psychomotor domains [13]. Student learning outcomes in classes that use learning models *REACT* relatively high. The increase in student learning outcomes is due to the application of learning *REACT* which is a type of cooperative learning that requires students to be more active and fully responsible in understanding learning material both in groups and individually.

The high value of learning outcomes because of learning with learning models *REACT* encourage students to be totally involved in finding, assembling, observing and analyzing the title of the material presented by the teacher and involved in group work. So that in the class that is applied to learning *REACT* students independently look for the material being studied and then assemble it in the form of a resume.

Application of learning models *REACT* as a whole can improve student learning outcomes because this model departs from contextual and constructivist learning which emphasizes the meaningfulness of learning. Learning will be more meaningful if students experience what they learn will only memorize. Contextual learning encourages students to make connections between the knowledge they have and its application in everyday life.

The advantage of this model is that it has a gradual understanding strategy from the basic understanding that appears in stages *Applying* and deep understanding of the stages *Transfering* [14]. At stages *Applying* students are focused on meaningful learning activities through the provision of various assignments. Meanwhile at the stages *Transfering* students exchange ideas with other friends and show ability to learn knowledge and apply it in new situations and contexts. Stage *Experiencing* in the learning model *REACT* is an important stage for students to build science process skills because at this stage it involves students directly inconducting experiments to solving problems, not just memorizing and reading or listening to lectures from the teacher.

IV. CONCLUSION

After going through the learning process by using the *REACT* type contextual learning method in class X Mathematics and Natural Science 4 and in class X Mathematics and Natural Science 1 using the method learning discovery learning, then it can concluded that the results of the analysis are known the tcount value is 2,127 and the probability is 0.00. Because the probability value shows 0.00 < 0.05 then H0 rejected. So can it can be concluded that there is a significant effect between the learning outcomes of experimental class and control class. It is known the value of tcount is 2.127 while the ttable value is 1688. Based on these data, at test was performed two sides with the receiving area H0 between (-1.691) to (1.691). tcount value of 2,127 is in the rejection area ttable or H0 rejection area, then can known H0 rejected. Based on the results it can be concluded that the hypothesis (H0) which states “no influence application of learning models REACT models to results learning physics students of class X Mathematics and Natural Science Public High School 1 RAO" rejected. With thus it can be concluded that there is the application of the *REACT* model on Momentum, impulse and simple harmonic vibrations have a significant influence on the results of Learning Materials Physics Class Students X Mathematics and Natural Science Public High School 1 RAO at the level significance 0,05.

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