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THE INFLUENCE OF EXPERIMENTAL LEARNING METHODS AND APPLICATION OF THE MULTIMEDIA COMPUTER-BASED AGAINST THE RESULTS OF HIGH SCHOOL PHYSICS LEARNING

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ABSTRACT

This research aims to know the influence of the application of experimental learning methods and computer-based multimedia results studied physics in HIGH SCHOOL. This research was carried out in SMA Negeri 3 Manado Class X with the entire population of students of the semester I force 2017 and the sample was grade A (experimental methods), class B (multimedia computer-based), and class C (conventional method); with each class consists of 27 students.

Hypothesis testing using the ANOVA Bonferroni test and test. The first hypothesis test results obtained Fhitung (48,368) > Ftabel (3,114) at $\alpha = 0.05$; that means there is a significant influence of experimental learning methods, multimedia, computer-based and conventional learning methods against the results studied physics in HIGH SCHOOL. Hypothesis testing-2nd retrieved Sig (0.001) < α (0.05); that means there is a significant difference in average outcomes studied physics HIGH SCHOOL groups of students taught with the use of experimental learning methods and the Group taught by using computer-based multimedia. The third hypothesis testing shows Sig (0.000) < α (0.05), which means there is a significant difference in average outcomes studied physics HIGH SCHOOL groups of students taught with the use of experimental learning methods and a group of students who are taught by using conventional learning methods. The fourth hypothesis testing retrieved Sig (0.000) < α (0.05); that means there is a significant difference in average outcomes studied physics HIGH SCHOOL groups of students taught with the use of computer-based

and multimedia groups of students taught by either using conventional learning methods. This research is expected to be input for HIGH SCHOOL physics teacher teams to develop and exploit the variation method of learning in learning Physics in HIGH SCHOOL.

KEYWORDS: *Experimental Learning, Multimedia, learning, Learning achievement.*

INTRODUCTION

The learning achievements of students in all grades X SMA Negeri 3 Manado on subjects of HIGH SCHOOL Physics is not a maximum where there are still many students who earn less than the value of the KKM, this gives an indication that students in all grades X SMA Negeri 3 Manado suffered a hitch d nature of learning Physics in HIGH SCHOOL. Improvements to the learning process continues so that student learning achievements will be increased. evaluation systems continue to be addressed in order to obtain a good learning.

Increase in the ability of the student's mastery in subjects Physics HIGH SCHOOL can be done among others through a process of learning that goes well. Learning with the contextual approach can be one of the options to be applied in HIGH SCHOOL Physics learning builds advanced scientific concepts and implementation in various fields of science.

On other conditions besides learning approach via model changes also can be applied to learning assessment process need to be developed in accordance with the changing mechanisms of learning. Through proper assessment can give good feedback to the students themselves also for teachers. A good learning process must also be accompanied by a good assessment process, in order to really be able to measure the achievement of student learning. The assessment process will demonstrate its competitive zeal for students to Excel, but rather the assessment process that the less well can undermine the desire of students to Excel.

The characteristics and cultural study in Indonesia, where students always observe the process of transformation of the teaching given in this group, the tendency of teachers discussing the matter, writing during the transformation process of learning to walk, ask and commented when lessons take place. Other properties that stand out in the learning behavior is likely to be serious students learn if would have done the appraisal. Therefore to assess the success of student learning not only observed but need to do tests. The test results will be used as one of the main basis for referring the process or action. If the evaluator process is less able to assess the results of a study that can actually cause the maximum not the next

activities. Therefore the assessment becomes important in a process of learning including learning at school. The implementation of this research intended to find out about:

1) Influence of experimental learning methods, multimedia, computer-based and conventional learning methods against the results studied physics in HIGH SCHOOL.

2) Difference results studied physics in HIGH SCHOOL a group of students who are taught by using experimental methods and groups of students taught using computer-based multimedia.

3) Difference results studied physics in HIGH SCHOOL a group of students who are taught by using experimental methods and groups of students taught using conventional methods.

4) to avoid an outcome studied physics HIGH SCHOOL groups of students taught with the use of computer-based and multimedia groups of students taught by using conventional methods.

According to Slameto (2010:82) method is a way or path that must be traversed to reach the learning objectives that have been set. Study aims to gain the knowledge, attitudes, skills, and skills, the methods used will become a habit.

The learning method is a set of components that have been dikom ¬ binasikan optimally for the quality of learning (Trianto, 2007:32). According to Uno (2008:2) method of learning is defined as the way a teacher, in the exercise of their functions is a great tool to download ¬ achieve learning objectives. Learning methods more procedural in nature, i.e. contains certain stages. According to Smaldiono in private (2010:42) is the process of learning methods or procedures used by the teacher or instructor to achieve objectives or competencies. According to Taufik (2010:13), learning methods can be defined as a method that is used to implement the plans already drawn up in the form of real and practical activities to reach the learning objectives. So, learning methods are all planning or procedures to be used in carrying out the activities of teacher learning to achieve a goal of learning.

Experimental methods or experiments are often also called the experiment. According to Djamarah (2002:95) experimental method is a way of presenting the rig ¬ ran, where students experiment with experienced something that is learned. On the learning process, with the method eksperimensiswa was given the opportunity to do it yourself, follow a process, and observe an object. According to Roestiyah (2001:80) experimental method is a way of teaching, where students perform an experiment about something, watching the process and

results of his experiments, and then write down the observations it submitted to the classroom and evaluated by the teacher.

Learning with the method of experiment teaching and training the learners (students) to learn the concept of nature as well as a scientist in the field of science. Experimental method encourages students to actively learn by following the stages of the lesson. Thus, students will find themselves in accordance with the concept of results in ¬ acquired over learning.

Experiments can be carried out at a laboratory or outside the laboratory. Whereas the method of experimentation in learning is a way of presentation materials that allow students to experiment to prove itself a question or hypothesis that is studied. In the learning process by the method of experiment students were given the opportunity to experience yourself or do it yourself, following the process, observing an object, analyze, draw conclusions and prove myself about an object, the State or specific process. The role of teachers in the method of experimentation is giving guidance so that the experiment was done carefully so it does not happen confusion or error.

There are several ways to overcome the weakness of the experimental method, namely: 1) the teacher should explain in palpable results to be achieved with the experiment; 2) teacher should explain the procedure of experiments, experimental materials required, necessary equipment usage, variables that need to be controlled, and it should be noted that during the experiment; 3) oversee the execution of experiments and provide assistance if students are having difficulty; 4) ask each student to report the process and results of his experiments, membanding-bandingkannya, and discuss it to know the shortcomings and errors that may occur; and 5) for more details regarding this will be given instructional steps-steps what needs to be done in applying experimental learning methods.

Thus, the experimental method is a method in which in was directly involved in student learning both physically, mentally, and emotionally, because this method is in the form of an experiment performed in the lab nor outside the laboratory.

According to Sudrajat (2010) computer is a type of media that can provide virtually immediate response against the results of a study conducted by the students. More than that, the computer has the capability of storing and manipulating information according to your

needs. The rapid development of technology currently has allowed computer load and serve the diverse forms of media in it.

Audio visual technology how to produce or deliver the material with the use of mechanical machinery and electronics to present audio visual messages. Teaching through audio-visual clearly characterized by the use of the hardware during the learning process, such as machine movie projector, tape recorder, and a wide visual projector. So, teaching through audio visual is the production and use of material absorption through sight and hearing as well as not entirely depends on the understanding of a word or symbol symbols are similar. The main features of the audio visual media technologies are as follows (Azhar A, 2015).

The study delves into the three types of Computer supported cooperative learning strategies (STAD, Jigsaw II, and TAI) as a way to overcome a poor performance in physics at the secondary school level in Nigeria. All three computer supported cooperative learning strategies have a positive effect on the attitude of students towards Physics versus individualised computer instruction (ICI). However, Jigsaw II is a computer supported them. Cooperative strategies to have a positive effect on student learning performance compared to the ICI. In addition, cooperative learning strategies do not improve retention compared to ICI. (Gambari Isiaka Amosa, and Joseph Olalere Mudasiru, 2017:16).

Computer-based multimedia can also be utilized as a means of doing simulation to train specific skills and competencies. For example, the use of aircraft cockpit simulator that allows students in pe ¬ and Flight Academy can practice without risk of falling. Another example of the use of the multimedia computer-based multimedia lan ¬ winnowing fork is in the form of animation that allows students in the study of biological experiment without having to be in the lab.

Media in learning has a function as a tool to clarify the message guru. The media also serves to individual learning where to position the media fully serves the needs of student learning (bermedia patterns).

According to Priyanto (2009) use of computer-based multimedia in learning has benefits, among other things: 1) learners/students can work independently according to their ability level or in a small group, 2) more effectively to explain new material that is both an interactive simulation so that learners get an interesting learning experience, 3) existing

assessments can provide rapid feedback on the student to know his ability on a particular matter or issue so it can be used as a summative assessment, and 4) with the techniques of solving a problem, students will have its own way to solve the problem with the same material with his friend.

So, computer-based multimedia adalahberbagai tool digunakanoleh of teachers in one study in this case using a computer, which allows students studying a material with just audio (hearing), or visual (seeing), or audiovisual (seen and heard.

One of the learning models are still valid and are very much used by the teacher is a model of conventional learning. According to Djamarah (1996:51), conventional learning methods are traditional learning methods or also called the lecture, because historically this method has been used as a means of oral communication between teachers with students in the process of study and learning. In learning the history of the conventional methods marked with lectures accompanied by explanations, as well as the Division of tasks and exercises.

In general the characteristics of conventional learning are: 1) the student is a recipient of information passively, where students receive knowledge from a teacher and diasumsinya knowledge as a body of information and skills that are owned in accordance with standard, 2) learn individually, 3) very abstract and theoretical learning, 4) behavior built up habits, 5) the absolute nature of truth and knowledge is final, 6) teachers are deciding the course of the process of learning good behavior, 7) based on extrinsic motivation, 8) interaction among students, and teachers often Act 9) pay attention to process groups that occur in the groups studied. Also note that the teaching model is seen as effective or have superiority, especially: 1) various information not easily found elsewhere, 2) convey information quickly, 3) intriguing information, 4) teach students the best way of learning by listening, dan5) is easy to use in the process of teaching and learning.

While the weakness of the study is as follows: 1) not all students have the best way of learning by listening, 2) frequent difficulties to keep the students interested with what is learned, 3) students not knowing What is the purpose of their learning on that day, 4) emphasis is often only on the completion of the task, and 5) serapnya low power and fast are lost due to memorize. As for the conventional learning syntax is as follows: 1) delivering the goals, teachers deliver lessons that all goals to be achieved in these lessons; 2) present information, teachers present information to students in stage by stage with a method of

speaking engagements; 3) check out their understanding and provide feedback, teachers check out student success and provide feedback; 4) provides an opportunity for advanced exercises, teachers give additional tasks to do at home (Azyraf, 2013). So, the conventional learning method is a method of traditional learning, which in practice this learning more dominated by teachers rather than students themselves.

According to Sudjana (2006:22), learning and teaching as a process contains three elements can be distinguished, namely the purpose of teaching (instructional), teaching-learning experiences (the process), and the results of the study. Assessment activities i.e. an act or activity to see the extent of instructional objectives have been achieved or can be mastered by students in the form of the results of the study are shown after they drove their learning experience (teaching-learning process).

Sudjana (2006:22) Horward Kingsley divided the three kinds of learning outcomes, namely (a) skills and habits, (b) knowledge and understanding, (c) attitudes and ideals. Each type of learning outcomes may be filled with material that has been implemented in the curriculum. While Gagne mem ¬ for five categories of learning outcomes, namely (a) verbal information, (b) intellectual skills, cognitive strategies (c), (d) attitudes, and (e) motoris skills.

From the explanation above about the results of the study it can be concluded that a student in the following learning activities will receive the results of their learning which is the changes obtained after making the learning process that endured at school.

The hypothesis in this study that can be presented as follows:
1) There is the influence of experimental learning methods, multimedia, computer-based and conventional learning methods against the results studied physics in HIGH SCHOOL.
2) There may be differences in average outcomes studied physics in HIGH SCHOOL a group of students who are taught with the use of experimental learning methods and a group of students who are taught by using computer-based multimedia.
3) There may be differences in average outcomes studied physics in HIGH SCHOOL a group of students who are taught with the use of experimental learning methods and groups of students taught with the use of conventional learning methods.
4) There may be differences in average outcomes studied physics in HIGH SCHOOL a group of students who are taught with the use of computer-based and multimedia to ¬ lompok students who are taught with the use of conventional learning methods.

RESEARCH METHODS

The research was carried out in SMA Negeri 3 Manado Class X that are located in the administrative subdivisions of the city of Manado Tuminting. Implementation time research on the odd semester academic year 2016/2017. Research method used is the method of experimentation. Where the results of the study which is the data from the studies were grouped into three, namely 1) results of study class taught by using experimental learning methods, 2) results of study on classes that are taught with the use of multimedia-based computer, and 3) results of study on classes that are taught by using conventional learning methods. Design research is the Posttest-Only Control Design.

Conceptual Definition

1) Experimental Method, teachers can develop the involvement of physical and mental, emotional as well as students. Students had the opportunity to train their skills in order to obtain the results of the learning process that is the maximum. The experience can be directly embedded in his memory. The involvement of physical and mental and emotional students required it can be introduced in a way or the condition of learning that can foster a sense of confidence and also innovative and creative behavior.

2) Cereal-based multimedia computer can be defined as technology that optimizes the role of computers as a means to display and reverse text, graphics, and sound in an integrated display. With display can combine various elements of information and delivery of messages, the computer can be designed and used as an effective technology to learn and teach the relevant learning material such as draft graphics and animation.

3) Conventional learning methods are traditional learning methods or also called the lecture, because historically this method has been used as a means of oral communication between teachers with students in the learning process and learning.

4) Learning Outcome is an outcome that has been achieved by the students after doing a learning activity especially on the material of the cell, environment, and reproductive systems of animals and plants.

Variable treatment

Experimental Method I: treatment or experiment is often also called the experiment, is a way of presenting the lesson, in which students conduct experiments with experienced something that is learned. In the process of teaching and learning, with the method of

experiment, students were given the opportunity to do it yourself, wheezing ¬ kuti a process, observing an object, process or state something.

Treatment II: Multimedia computer-based Dishes can be defined as technology that ¬ se optimize the role of computers as a means to display and reverse text, graphics, and sound in an integrated display. With the display that can mengkom ¬ binasikan various items of information and delivery of messages, the computer can be designed and used as an effective technology to learn and teach the relevant learning material such as draft graphics and animation.

Treatment III: Conventional learning Method is a method of traditional learning, because this method has been used since long ago as a communication tool in the learning process and learning conventional look that the learning process more many teachers or teacher-dominated as "pen-transfer", while science students more passive as the "recipient" of science. Learning using this method that is commonly done by teachers or teacher that is giving the material through lectures, exercises a matter then the giving task. The lecture is one of the ways of delivery of information by oral from someone to a number of listeners in a room. Activities centered on direct communication and a lecturer from the reader to the listener. In general the conventional learning characteristics among others are: student or student is recipient information passively, where students receive knowledge from a teacher and diasumsinya knowledge as a body of information and skills that are owned in accordance with the standards, also often known to learn individually, as well as very abstract and theoretical learning, built up habits.

Learning outcome variables

The results of the study are the score shown by students after being given the treatment with the experimental methods applied and computer-based multimedia; then given questions that illustrate the capabilities of students including, understanding, knowledge, and analysis on subjects of HIGH SCHOOL Physics curriculum SMA Negeri 3 Manado Class X listed in the the purpose of the learning activity in particular on kinematics, dynamics and materials.

Population: the population in this study are students of the semester I SMA Negeri 3 Manado Class X 2016 host.

Sample: sampling in this study conducted in random sampling techniques are divided into three classes; where a class as a method of treatment of experimental classes, one class as a class treatment by using computer-based multimedia, and one class as kelaskontrol where learning method using pem ¬ belajaran conventional.

Data collection techniques: HIGH SCHOOL Physics learning results Data obtained by giving the test.

Before carrying out the test, the test question tested (valid and reliability). Test the validity of the instrument using the correlation coefficient learning results biserial because score grain problem dis-continuum (score rounds reserved 0 atau1). The formula used to calculate the coefficient of biserial correlation between the score grain problem with score total test reliability Test instruments are: the results of a study using the formula of the KR-20, Engineering Data Analysis: Data obtained further processed and analyzed by the following measures: a test of normality: a test of normality aims to find out whether the data that is retrieved is a normal distribution or not. Test of normality in this research is done through the Liliefors test. Test of its homogeneity. Its homogeneity of variance test used to know two or more groups of data samples come from populations that have the same variance or not. Its homogeneity of variance test data is analyzed in this study posttest by using SPSS 17.0 software help. The test statistic is based on the average data (Based on the Mean).

Test the hypothesis

For testing this hypothesis using analysis of variance (ANOVA), analysis of variance of one way (One way Analysis of Variance) with the help of software SPSS 17.0. Level of significance used was 95% or with $\alpha = 0.05$. If the Fhit > Ftab at significant levels which Ho is rejected and the Ha are received. So there is a difference between the average parameters of the groups tested, preferably to Fhit ≤ Ftab, mean Ho accepted or not there is a difference the average parameters of the groups tested or mean the same.

RESULTS OF THE RESEARCH AND THE DISCUSSION

Research Results

The data in this study were obtained from three sampling classes, namely class A, class B, and class C the first SMA Negeri 3 Manado Class X the Data analyzed in this research is data from third class posttest results samples.

Table 1: Descriptive Data the results of the study.

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Eksperimental	27	70,7407	12,68734	2,44168	65,7218	75,7597	50,00	90,00
Multimedia	27	56,8519	13,45564	2,58954	51,5290	62,1747	35,00	85,00
Konvensional	27	28,7037	12,97872	2,49776	23,5695	33,8379	5,00	50,00
Total	81	52,0988	21,80688	2,42299	47,2769	56,9207	5,00	90,00

Based on table 1. the results of the study are obtained from third class, the next sample frequency distribution table is created. The shape of the table used is the distribution of the frequency distribution of the group.

Table 2: Results frequency distribution table studied physics HIGH SCHOOL students who were taught with the use of experimental method.

No. Kelas	Interval Kelas	Nilai Tengah	Frekuensi	Frekuensi Kumulatif	Frekuensi Relatif
1	50-56	53	3	3	(3/27) x 100 = 11,11
2	57-63	60	5	8	(5/27) x 100 = 18,52
3	64-70	67	8	16	(8/27) x 100 = 29,63
4	71-77	74	2	18	(2/27) x 100 = 7,41
5	78-84	81	3	21	(3/27) x 100 = 11,11
6	85-91	88	6	27	(6/27) x 100 = 22,22
Σ			27		100%

Table 2 shows that the score for the class that was taught by using experimental methods of 29.63% of students obtained average value; where 29.63% of students scored below the median − median and 40.73% mahsiswa scored above average.

Table 3: Frequency distribution Tables results of HIGH SCHOOL students who studied physics taught by using computer-based multimedia.

No. Clsas	Class Interval	Middle Values	Frequency	Frequency Cumulative	Frequency Relative
1	35-42	38,5	4	4	(3/27) x 100 = 14,81
2	43-50	46,5	7	11	(6/27) x 100 = 25,93
3	51-58	54,5	3	14	(3/27) x 100 = 11,11
4	59-66	62,5	5	19	(8/27) x 100 = 18,52
5	67-74	70,5	6	25	(3/27) x 100 = 22,22
6	75-92	83,5	2	27	(4/27) x 100 = 7,41
Σ			27		100%

Table 3 shows that the score for the class that was taught by using computer-based multimedia 11.11% of students obtained average value; where 40.74% of students scored below the median – median and 47.95% of students scored above average.

Table 4: Frequency distribution of the results of HIGH SCHOOL students who studied physics taught by using conventional.

No. Clsas	Class Interval	Middle Values	Frequency	Frequency Cumulative	Frequency Relative
1	5-12	8,5	3	3	(3/27) x 100 = 11,11
2	13-20	16,5	6	9	(6/27) x 100 = 22,22
3	21-28	24,5	3	12	(3/27) x 100 = 11,11
4	29-36	32,5	8	20	(8/27) x 100 = 29,63
5	37-44	40,5	3	23	(3/27) x 100 = 11,11
6	45-52	48,5	4	27	(4/27) x 100 = 14,82
Σ			27		100%

Learning methods

Table 4 shows that the score for the class that was taught by using conventional learning method 11.11% of students obtained average value; where is 33.33% of students scored below the median – median and 55.58% of students scored above average.

Test the validity of the instrument validity

Test results: learn to use the coefficient of biserial correlation between the score grain problem with score total tests. From a 25-round reserved retrieved 20-valid question (rtabel > rbis) and 5 grain problem invalid (rbis < rtabel). All questions are considered valid is used to measure the results of the study.

Reliability test: Next rounds reserved valid calculated using the formula reliabilitasnya coefficient KR-20. Based on the calculation of the reliability coefficient is obtained (rii) = 0.905. This means that reliability is very high.

Data normality test results of HIGH SCHOOL Physics learning using Liliefors Test with the help of Microsoft Excel. Liliefors techniques using individual data inspection approaches in whole (Group).

Table 5: Normality test summary.

Class	n	L_o	L_t	Conclusion
Experiment 1	27	0,122	0,173	Normal
Experiment2	27	0,149	0,173	Normal
control	27	0,207	0,173	Normal

Based on table 5 Ltabel price Liliefors views that each class at a significant level (α) = 0.05 is greater than the value of Lo in each class. So this shows that experimental class 1, class 2, and class experiment a control derived from the Gaussian populations.

Its homogeneity test: testing of its homogeneity of variance data results studied physics in HIGH SCHOOL is analyzed using SPSS 17.0 software help. The results obtained bahwat score statistics Based on the Mean obtained Sig. = 0,844. Because the Sig (0,844) > α (0.05). With this research data is the more homogeneous or Ho and Ha was rejected. Based on the results of the prerequisite test, that test results of its homogeneity and normality, then parametric analysis can be done.

Hypothesis testing: testing the first hypothesis test using analysis of variance (ANOVA), analysis of variance in one direction (One way Analysis of Variance) with the help of software SPSS 17.0. One-way ANOVA test results has been done pointing ¬ kan that the values test F significant at this group test, indicated by the Fhitung value of 72.789 is greater than Ftabel (0.05; 2; 78) of 3.114 (Fhitung > Ftabel), reinforced with significance testing (Sig.) = 0.000 smaller than α = 0.05; then the zero hypothesis was rejected.

The magnitude of the influence of free variables against variable is calculated using the coefficient of determination R^2 = (JK (A))/(JK (T)). Calculation based on retrieved R^2 = 0.651. This means learning factors can explain that 65.1% influenced by variations in HIGH SCHOOL Physics learning.

For hypothesis testing second, third, and fourth is done further tests (Post Hoc Tests). Advanced test (Post Hoc Tests) used is the Bonferroni test. Based on the results of the ujil Post Hoc Tests which showed a difference of the average results of the study are between experimental methods with computer-based multimedia, experimental methods with conventional methods, and computer-based multimedia with conventional learning methods. Between experimental methods with computer-based multimedia shows the value of the Sig (0.001) < α (0.05); that means Ho denied and Ha is received. Between experimental methods with conventional methods of demonstrating the value of Sig (0.000) < α (0.05); that means Ho denied and Ha is received. Similarly, experimental methods with conventional methods of data research results show the value of Sig (0.000) < α (0.05); that means Ho denied and Ha received.

DISCUSSION OF RESEARCH RESULTS

HIGH SCHOOL Physics learning outcomes data tested the validity and reliability first. From as many as 25 grains of matter, retrieved 20-reserved 5 round a valid and an invalid question. As many as 20 rounds reserved this becomes a valid question posttest were used to measure the results of learning Physics in HIGH SCHOOL. Next do a test reliability, reliability test instrument based on the results of the study have very high reliability, i.e. (rii) = 0.905.

Its homogeneity and normality testing done before the hypothesis testing, because this is a test of statistical assumptions analysis requirements. The data used in this test is the third grade at posttest score samples with the material heat volunteered. Based on tests showing that third-grade samples come from a population of Gaussian and has variance homogeneity.

The first hypothesis testing in this study using a test analysis of variance (ANOVA), analysis of variance in one direction (One way Analysis of Variance), then proceed with the Bonferroni test. A one-way analysis of variance testing aims to see the influence of experimental learning methods, multimedia, computer-based and conventional learning methods against the results of HIGH SCHOOL Physics learning on student semester test ANOVA Based one. the direction has been done shows that the value of Fhitung = 72, 789lebih than Ftabel (0.05; 2; 78) = 3.114. Because Fhitung > Ftabel, then the zero hypothesis is rejected and the alternative hypothesis is accepted which means there is a significant influence of experimental learning methods, multimedia, computer-based and conventional learning methods against the results of the HIGH SCHOOL Physics learning as in table 6. Decision making is also reinforced with significance testing (Sig.) = 0.000 smaller than α = 0.05.

Table 6: Anova.

	Sum of Squares	df	*Mean Square*	F	Sig.
Between Groups	24770,988	2	12385,494	72,789	.000
Within Groups	13272,222	78	170,157		
Total	38043,210	80			

The third influence the magnitude of further learning methods to HIGH SCHOOL Physics learning results calculated using the coefficient of determination, with the formula $R2 = (JK (A))/(JK (T))$. Based on the calculation of the coefficient of determination $R2 = 0.651$ obtained. This means learning factors can explain that 65.1% influenced by variations in learning Physics in high school, and the rest is 34.9% certainly is influenced by other factors not examined in this study.

The results tabulate test ANOVA showed Ha accepted (no influence), then further testing (Post Hoc Tests) done. This test function to see which group is different. Based on tabulated test of homogeneity of variances showed that the variance of the third group of the same data, then further testing (Post Hoc Tests) used is the Bonferroni test.

Experimental methods with computer-based multimedia shows the value of the Sig (0.001) < α (0.05); HO denied and Ha is received. This shows that there are significant differences in average outcomes studied physics in HIGH SCHOOL a group of students who are taught with the use of experimental learning methods and a group of students who are taught by using computer-based multimedia. This is reasonable because one of the advantages of experimental methods according to Sumantri and also (1999:158) is the result of good students with controlled learning and lasting memories, because students are directly involved in a HIGH-SCHOOL Physics learning in this practical work; compared to learning with computer-based multimedia in which students only see and hear a presentation material without was directly involved in the operations of a lab course.

Experimental learning methods with conventional learning methods have value Sig (0.000) < α (0.05). This means there is a significant difference in average outcomes studied physics to HIGH SCHOOL students taught by lompok ¬ by using experimental learning methods and groups of students taught with the use of conventional learning methods. The third hypothesis testing, Ho and Ha rejected accepted. Computer-based multimedia with conventional learning methods have value Sig (0.000) < α (0.05). This means there is a significant difference in average outcomes studied physics HIGH SCHOOL groups of students taught with the use of computer-based and multimedia groups of students taught by either using conventional learning methods. The fourth hypothesis testing, Ho and Ha rejected accepted. In line with the opinions expressed by Priyanto (2009), namely that the computer-based multimedia in learning gives new shades to make learning to become more interactive, effective, efficient, and attractive; the course will have a direct impact on the results of the students learning to be more optimal.

CONCLUSION

Based on the results of the analysis and discussion of it can be summed up as follows:

1) there are significant effects of experimental learning methods, multimedia, computer-based and conventional learning methods against the results studied physics in high

school, with Fhitung (72,789) > Ftabel (3.114). The results of learning Physics students 65.1% influenced by variations in learning Physics high school students.

2) there are significant differences in average outcomes studied physics in HIGH SCHOOL a group of students who are taught with the use of experimental learning methods and groups of students taught with the use of mul timedia ¬ computer-based, with a value of Sig (0,001) < α (0,05).

3) there are significant differences in average outcomes studied physics to HIGH SCHOOL students taught by lompok ¬ by using experimental learning methods and groups of students taught with the use of conventional learning methods, with the value of the Sig (0,000) < α (0,05).

4) there are significant differences in average outcomes studied physics to HIGH SCHOOL students taught by lompok ¬ by using computer-based multimedia and a group of students who are taught by either using conventional learning methods, with the value of the Sig (0.000) < α (0,05).

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