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The Effect of Experimental and Computer-Based Multimedia Learning Application on the General Biology Learning Achievement

Ferny Margo Tumbel
Department of Biology, Faculty of Science and Mathematic,, State University of Manado, Indonesia
* E-mail: margo.tumbel@yahoo.com

Abstract

This research aims to know the effect of experimental and computer-based multimedia learning method application on the General Biology learning achievement. This research is conducted in Biology Department, Mathematics and Natural Science Faculty, UNIMA. The population is all semester I students batch 2012 and the sample is class A students (experimental method), class B (computer-based multimedia), and class C (conventional method); where each class consists of 27 students. The hypothesis testing use ANOVA and Bonferroni test. The first hypothesis test result obtains F_{count} (48.368) > F_{table}(3.114) at α = 0.05; which means that there is significant effect of experimental, computer-based multimedia, and conventional learning methods on the General Biology learning achievement. The second hypothesis testing obtains Sig.(0.001) < α(0.05); which means that there is significant difference of the General Biology achievement average of the student group which is taught using experimental learning method and the other group which is taught using computer-based multimedia. The third hypothesis testing shows Sig.(0.000) < α(0.05), which means that there is significant difference of the General Biology learning achievement average of the student group which is taught using experimental learning method and the other group which is taught using conventional learning method. The fourth hypothesis testing obtains Sig.(0.000) < α(0.05); which means that there is significant difference of the General Biology learning achievement average of the student group which is taught using computer-based multimedia and the other group which is taught using conventional learning method. This research is expected to be input for the General Biology lecturer team to develop and utilize the learning method variation in General Biology learning.

Keywords: Experimental, Computer-Based Multimedia, Learning Method, Conventional Learning Method, Learning Achievement

1. Introduction

There are many factors that cause the learning process in campus not maximal. For the example, the lack of facility and lecturer capabilities. The other condition is the special coaching for improvement of the first year student achievement is not conducted. The other effect is the students have not been able to adapt with the learning atmosphere at campus. The freshmen are still accustomed with learning style at highschool. This condition causes their learning achievement is still not maximal yet. At the other side also, the interaction of student and lecturer has not created a good learning interaction yet. This condition has to be coped with various methods. The learning model at the first year must be able to bring a change that lead to systematic learning way. This condition cannot be allowed. It needs some continuous efforts to improve this condition. Therefore, this research aims to fouces at the biology learning problem at campus, such as learning process plan at class and the lecturer capability to conduct the biology learning so that the biology learning becomes interesting and fun for all students which impact to their learning achievement.

The student learning achievement at all department of Mathematics and Natural Science Faculty at the first year, especially for the general biology I is not maximal where there are still many students get less that 3 score. This indicates that the students at all departments of Mathematics and Natural Science get obstacles in learning General Biology. The learning process improvement is still striven so that the learning achievement of the students can be improved. The evaluation system continuously improved to obtain good lecture.

The student mastery ability improving at General Biology subject can be conducted trough well-conducted lecture process. Learning using contextual approaching may be an option to be conducted in General Biology lecture to build advanced scientific concepts and application in various fields of science.

At another condition, beside the learning approaching through learning model changes, the assessment process

also needs to be developed in accordance with changes in learning mechanisms. Through proper assessment, it can give good feedback to the students themselves also for lecturers. Good learning process must also be accompanied with a good assessment process, in order to be really able to measure the student learning achievement. Good assessment process will also encourage a competitive spirit for students to excel, but otherwise the poor judgment can ruin students' desire to excel.

Learning characteristic and culture in Indonesia, where the students always observe the transformation process which is given by teachers in this faculty, the tendency of groups to discuss the material, writing during the transformation learning process, and also ask and comment during the learning process. Another prominent trait in the study behavior is the students tend to learn seriously if it will be assessed. Therefore, to assess the success of the student learning, it should not only be observed but the tests are necessary. The test results will be used as one of the main basis for referring the future process or action. If the assessment process is less able to assess the actual learning achievement, it would lead to not maximal further activity. Therefore, an assessment is important in the learning process includes learning on campus. The implementation of this study aims to find out about:

1) The effect of experimental learning methods, computer-based multimedia and conventional teaching methods on General Biology learning achievement.
2) The General Biology learning achievement differences of student group which is taught using the experimental method and the group which is taught using computer-based multimedia.
3) The General Biology learning achievement differences of student group which is taught using the experimental method and the group which is taught using conventional method.
4) The General Biology learning achievement differences of student group which is taught using computer-based multimedia and the group which is taught using conventional method.

According to Slameto (2010:82), method is a way that must be past through to achieve the learning objectives that have been set. Learning aims to acquire the knowledge, attitudes, skills, in ways that used to be a habit.

This method of learning is a set of components that have been combined optimally to the quality of learning (Trianto, 2007:32). According to Sukardi (2003:2), learning method is defined as the way which is used by teachers, which in its function is a tool for achieving learning objectives. The learning method is more procedural, which contains certain stages. According to Smaldiono in Pribadi (2010:42), learning method is a process or procedure that is used by teachers or instructors to achieve goals or competencies. According to Taufik (2010:13), the method can be interpreted as a way of learning that is used to implement a plan that has been prepared in the form of real and practical activities to achieve the learning objectives. Thus, learning is the whole plan or procedure that is used by teachers in carrying out the learning activities to achieve a learning objective.

Experimental methods are often also referred to trial. According to Djamarah (2002: 95) the experimental method is a way of presenting lesson where the students experiment with their own experience of learning something. In the learning process, the experimental method gives opportunity to do by themselves, following a process, and observe an object. According to Pribadi (2010: 80), the experimental method is a method of teaching, where the students conduct an experiment on something, watch the process and write down the results of his experiments, and the observation results are presented to the class and evaluated by the teacher.

Learning using experimental method trains and teaches the learners (school students or university 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 learning stages. Thus, students will find the concept by themselves in accordance to the obtained result during the learning.

Experiment can be conducted at a laboratory or outside the laboratory. While the experimental method in the study is the lesson presentation method that allows students to conduct experiments to prove by themselves a question or hypothesis that is being learned. In learning using experimental methods, the students are given the opportunity to experience for themselves or doing it by themselves, follow the process, observe an object, analyze, prove and draw their own conclusions about an object, situation or process. The role of teachers in the experimental method is to provide guidance so that the experiment is done carefully so that no mistake or error.

There are several ways to overcome the weaknesses of the experimental method, i.e.: 1) the teacher should explain clearly the results to be achieved through the experiment, 2) the teacher should explain the experiment procedure, experiment materials that are needed, the required tools and how to use them, the variables that need to be controlled, and it must be noted during the experiment; 3) oversee the implementation of the experiment and provide assistance if students have difficulty; 4) asks each student to report the process and the results of his

experiments, comparisons, and discuss to find flaws and errors that may occur, and 5) for more details on this study, it should be given step by step what needs to be done in applying experiential learning methods.

Thus, the experimental method is a method of learning in which students are directly involved in either physically, mentally, and emotionally, because these methods is in the form of an experiment conducted in the laboratory and outside the laboratory.

According Sudrajat (2010), computer is a media type that can virtually provide immediate response to the study results conducted by the students. More than that, the computer has the ability to store and manipulate information according to the needs. The rapid change of technology today has allowed the computer to load and display various forms of media.

Today, computer technology is no longer just used as a computing and word processing (word processor) tool but also as multimedia learning media which enable learners to make a design and enginering a concept science. Computer-based multimedia can be defined as a technology that optimizes the role of the computer as a means to display and manipulate text, graphics, and sound in an intergrated appearance. An appearance that can combine various elements to deliver information and messages, the computer can be designed and used as an effective media technology for learning and teaching relevant lesson, e.g. graphic design and animation.

Computer-based multimedia can also be used as a means of doing simulations to practice certain skills and competencies. For example, the use of an aircraft cockpit simulator that allows the students in the aviation academy can practice without the risk of falling. Another example of the use of computer-based multimedia is multimedia appearance in the form of animation that allows students to perform experiments to study biology without having to be in the laboratory.

The media in learning has a function as a tool for teachers to clarify the message. Media also works for individual learning where media notch fully serve the needs of student learning (pattern of media).

According Priyanto (2009) the use of computer-based multimedia learning has benefits, i.e.: 1) learners/students can work independently according to their ability level or in small groups, 2) more effective to explain the new material in the form of interactive simulation so that learners get a engaging learning experience, 3) existing assessment can provide instant feedback on students' ability to learn in a particular matter or material that can be used as a summative assessment, and 4) with a problem-solving techniques, students will have their own way to solve the same problem with their peers.

Thus, computer-based multimedia tools is various tools that are used by teacher in learning process, in this case is computer which allows students to learn the material just with audio (hearing), or visual (seeing), or audiovisual (seeing and hearing).

One model of learning that is still valid and very much used by the teacher is a conventional learning model. According to Djamarah (2002: 51), conventional teaching methods are traditional learning methods or lecture method, because this method has always been used as a means of oral communication between teachers and students in the learning process. In teaching history, the conventional method is marked with lectures which accompanied by an explanation, and the division of tasks and exercises.

In general, the characteristics of conventional study are: 1) the student is a passive recipient of information, where students receive knowledge from the teacher and the knowledge is assumed as a body of information and possessed skills in accordance with the standards, 2) individual learning, 3) learning very abstract and theoretical, 4) built on custom behavior, 5) knowledge of truth is absolute and final, 6) the teacher is determinant of the learning process, 7) good behavior based on extrinsic motivation, 8) lack of interaction between students, and 9) teachers often acts giving attention to the learning groups. Also note that this model is deemed effective or have advantages, notably: 1) a variety of information that is not easily found elsewhere, 2) convey information quickly, 3) generate interest in the information, 4) teach students how to learn best by listening, and 5) easy to use in teaching and learning.

While the weakness of this learning are as follows: 1) not all the students have learned best by listening, 2) occurs often difficult to keep students stay interested in what is learned, 3) the students do not know what purpose they learned that day, 4) emphasis is often only on completion of the task, and 5) low absorption rate and rapidly lost because it is memorized. The conventional learning syntax is as follows: 1) presents the objectives, the teacher delivers all learning objectives to be achieved in the subjects; 2) presenting information, the teacher presents information to students step by step with the lecture method; 3) checking understanding and provide feedback behind, teachers check student success and provide feedback; 4) provide advanced training opportunities, teachers provide additional tasks to be done at home (Azyraf, 2013). Thus, conventional learning

method is a traditional method of learning, which in practice this learning more dominated by teachers rather than by the students themselves.

According to Sudjana (2006: 22), learning and teaching as a process contains three elements that can be distinguished, i.e. the goal of teaching (instructional), experience (process) of teaching and learning, and the results of the learning assessment. Assesment activity is a activity to see how far the instructional objectives have been achieved or mastered by students in the form of learning achievement after they go through the learning experience (learning process).

In Sudjana (2006: 22), Horward Kingsley splits three kinds of learning achievement, i.e. (a) the skills and habits, (b) knowledge and understanding, (c) attitudes and ideals. Each of these learning achievement types can be filled with a material that has been implemented in the curriculum. While Gagne divides in five categories of learning achievement, i.e. (a) verbal information, (b) intellectual skills, (c) cognitive strategies, (d) attitudes, and (e) motor skills.

From the above description of the learning achievement, it can be concluded that the students in participating learning activities will obtain the results of their study which is the changes obtained after learning that happened at school.

The hypothesis in this study that can be submitted as follows:

1) There is an effect of experiment learning methods, computer-based multimedia and conventional teaching methods on General Biology learning achievement.
2) There is an average difference of General Biology learning outcomes of student group which is taught using experiment learning methods and the group which is taught using computer-based multimedia.
3) There is an average difference of General Biology learning outcomes of student group which is taught using experiment learning methods and the group which is taught using conventional learning method.
4) There is an average difference of General Biology learning outcomes of student group which is taught using computer-based multimedia and the group which is taught using conventional learning method.

2. Research Method

The research is conducted in Biology Department, Faculty of Mathematics and Natural Science, UNIMA which is at Tataaaran and Koya sub-district, Minahasa Regency. The study is conducted at the first semester of 2012/2013 academic year. The used learning method is experiment method. While the learning achievement data which is the research data is grouped into three, i.e. 1) the learning achievement of the class which is taught using experiment learning methods, 2) the learning achievement of the class which is taught using computer-based multimedia, and 3) the learning achievement of the class which is taught using conventional learning methods. Design research is Posttest-Only Control Design.

Conceptual Definition

1) Experimental method, teachers can develop physical, mental, and emotional engagement with students. Students have the opportunity to practice skills in order to obtain the maximum learning results. Experience can be embedded directly in his memory. Physical, mental, and emotional involvement of student is expected can be introduced in a manner or condition of learning that can foster self-confidence and also innovative and creative behavior.
2) Computer-based multimedia presentation can be defined as a technology that optimizes the role of the computer as a means to display and manipulate text, graphics, and sound in an integrated display. With a combining view of the various elements of the delivery of information and messages, the computer can be designed and used as an effective technology medium to learn and teach relevant lesson, such as graphic design and animation.
3) Conventional learning method is traditional learning method or called lecture method, because since long age this method has been used as verbal communication medium between teacher and students in the learning and teaching process.
4) Learning achievement is an result that has been achieved by student after doing learning activity, especially cell, environment, and animal and plant reproduction system lesson.

Treatment variable:

Treatment I: Experiment or trial methods, is a way of presenting a lesson, in which students conduct experiments by themselves to learn something. In the learning process, the experimental method, students are given the opportunity to do their own, follow a process, and observe an object, situation or process.

Treatment II: Computer-based multimedia presentation can be defined as a technology that optimizes the role of the computer as a means to display and manipulate text, graphics, and sound in an integrated display. With a combining view of the various elements of the delivery of information and messages, the computer can be designed and used as an effective technology medium to learn and teach relevant lesson, such as graphic design and animation.

Treatment III: Conventional learning method is the traditional learning methods, since this method has been used long ago as a means of communication in the process of learning and conventional learning is seen that the learning process is mostly dominated by professors or teachers as "someone who transfer" the science, while students are more passive as "recipient" science. Learning by using this method is usually done by a professor or teacher that is to give lessons through lectures, exercises and then giving the task. Lecture is one way of delivering information orally from one to the number of listeners in a room. Activity is centered on the direction of the speaker and reader communication to the listener. In general, the characteristics of conventional learning are, i.e.: the student is a passive recipient of information, where students receive knowledge from the teacher and the knowledge is assumed as a body of information and possessed skills in accordance with the standards, also commonly known as individual learning, and the learning is very abstract and theoretical, which is built on habit.

Learning achievement variabel:

Learning achievement is demonstrated by the student scores after treatment through applied experimental methods and computer-based multimedia; then they are given questions that describe the ability of the students that includes understanding, knowledge, and analysis on General Biology subject according to the curriculum of Biology Department that is written in learning objective, especially at the cell, environmental, and reproductive systems of animals and plants lessons.

Population: The population in this study is the first semester students of the Biology Department Batch 2012.

Samples: This research uses random sampling techniques that are divided into three classes; where one class as a treatment class of experiment learning method, one class as treatment class of computer-based multimedia, and the class as control class where the learning activity use conventional learning methods.

Data Collecting Technique: The data of General Biology learning achievement is obtained by giving test.

Before carrying out the test, the test items is tested (valid and reliable). The validity test of the learning achievement instrument use biserial correlation coefficient for the score items were dis-continuum (item score of 0 or 1). The used formula to calculate the correlation coefficient between item score of question with the total score of the test are: Reliability test of learning achievement instrument using the KR-20 formula.

Data Analysis Technique: The obtained data is then processed and analyzed with the following steps: Normality Test: Normality test aims to determine whether the obtained data has normal distribution or not. In this research, the normality test is conducted using Liliefors test. Homogenity Test: The homogeneity test of variance is used to find two or more groups of data samples that is from populations which have the same variance or not. The variance homogeneity test of the post-test data in this research is analyzed using SPSS 17.0 software. Statistical testing is based on the average data (Based on Mean).

Hypotheses Test:

The hypotheses test use Analysis of Variance (ANOVA), that is *One way Analysis of Variance* with the help of SPSS 17.0 software. The used significance level signifikansi is 95% or with $\alpha = 0.05$. If $F_{count} > F_{table}$ at the significance level where H_o is rejected and Ha is accepted. If there is average difference of parameter among the tested groups, for $F_{count} \leq F_{table}$, it means H_o is accepted or there is no parameter average difference of the tested groups or the average is same.

3. Research Resuls and Disscussion

Research Results

The data in this research is obtained from three sample classes, i.e. class A, class B, and class C semester I of

Biologi Department. The analyzed data in this research is the *post-test* result data of the three sample classes.

Table 1 Descriptive data of learning outcomes

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Experiment	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
Convensional	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 obtained learning achievement from the three sample classes then made frequence distribution table. The used distribution table is group frequence distribution.

Table 2. Frequence distribution table of General Biology learning achievement of the students who are taught using experiment learning method.

Class Number	Class Interval	Mean	Frequence	Cumulative Frequence	Reativity Frequence
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 among the score of the experiment learning method class, there are 29.63 % students who get average score; whereas 29.63 % students get score that is lower than average and 40.73 % students get score that is higher than average.

Table 3 Frequence distribution table of General Biology learning achievement of the students who are taught using computer-based multimedia.

Class Number	Class Interval	Mean	Frequence	Cumulative Frequence	Reativity Frequence
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 among the score of the computer-based multimedia method class, there are 11.11 % students who get average score; whereas 40.74 % students get score that is lower than average and 47.95 % students get score that is higher than average.

Table 4. the frequency distribution of learning outcomes, general biology students taught using conventional teaching methods.

Class Number	Class Interval	Mean	Frequence	Cumulative Frequence	Reativity Frequence
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%

Table 4 shows that among the score of the conventional method class, there are 11.11 % students who get average score; whereas 33.33 % students get score that is lower than average and 55.58 % students get score that is higher than average.

Validity Test: The validity test of learning achievement instrument use biserial correlation coefficient among the item score and test total score. Among 25 question items, it is obtained 20 valid question items ($r_{biserial} > r_{table}$) and 5 invalid question items ($r_{biserial} < r_{table}$). All valid question items are used to measure the learning achievement.

Reliability Test: The reliabity coefficient of the valid question items is counted using KR-20 formula. Based on the calculation, it is obtained the realibility coefficient (r_{ii}) = 0.905. This means that the reliability is very high.

The normality test of General Biology learning achievement data uses Liliefors Test using *Microsoft Excel* software. Liliefors Technique uses individual data check approaching in the whole (group).

Table 5. Normality Test Summary

Class	n	L_o	L_t	Conclusion
Experiment 1	27	0,122	0,173	Normal
Experiment 2	27	0,149	0,173	Normal
Control	27	0,207	0,173	Normal

Based on Table 5, it is seen that Liliefors L_{table} value of each class at significance level (α) = 0.05 is greater than L_o value at each class. So, it shows that experiment cllss 1, experiment class 2, and control class is derived from the normal-distributed population.

Homogenity Class: The homogeneity test of General Biology learning achievement data variance is analyzed using SPSS 17.0 software. The result is the *Based on Mean* statistical obtains Sig.=0.844. Because of Sig.(0.844) > α(0.05), then this research data is homogen or the Ho is accepted and Ha is rejected. Based on the pre-requirement test result, i.e. normality test and homogeneity test result, then parametric analysis may be conducted.

Hypothesis Testing: The first hypothesis testing uses Analysis of Variance (ANOVA) test, that is *One way Analysis of Variance* using SPSS 17.0 software. The one way ANOVA result shows that F test value is significant at the test group. This is showed by F_{count} value which is 72.789 and greater than F_{table}(0.05; 2.78) which is 3.114 ($F_{count} > F_{table}$), and is strengthened by the testing significance (Sig.) = 0.000 which is less than α = 0.05; then the H_0 is rejected.

The effect of independent variable on the dependent variable is calculated using determination coeffincient R^2= *JK(A)/JK(T).* Based on the calculation, it is obtained R^2 = 0.651. This means the learning factor can be explained that 65.1% is affected by General Biology learning variation.

For the second, third, and fourth hypothesis testing, *Post Hoc Tests* is conducted. The used *Post Hoc Tests* is Bonferroni test. Based on the *Post Hoc Tests* result, the ones that show the difference of learning achievement average is between experiment method with computer-based multimedia, experimental method with

conventional method, and computer-based multimedia with conventional learning method. Between the experimental method and computer-based multimedia method shows Sig.(0.001) < α(0.05); which means Ho is rejected and Ha is accepted. Between the experimental method and conventional method shows Sig.(0.000) < α(0.05); which means Ho is rejected and Ha is accepted. Also the experimental method with conventional method, the research result data shows Sig.(0.000) < α(0.05); which means Ho is rejected and Ha is accepted.

Results Disccusion

The validity and reliability of General Biology learning achievement data is tested first. Among 25 question items, 20 question items is valid and 5 question items is not valid. There is 20 valid question items that become the post-test question to measure the General Biolgy learning achievement. Furthermore, the reliability test is conducted, and based on the reliability test of learning achievement instrument, it has very high reliability, that is $(r_{ii}) = 0.905$.

The normality and homogeity test is conducted before the hypothesis testing, because this is the requirement test of statistic analysis. The used data in this test is *post-test* score at three sample class with heat lesson. The test shows that the three sample classes are from a normal-distributed populasi and has homogeneous variance.

The first hypothesis test in this research use Analysis of Variance (ANOVA) test, that is *One way Analysis of Variance*, then continue with Bonferroni test. The one way Analysis of Variance test aims to see the effect of experimental, computer-based multimedia, and conventional learning method on General Biology learning achievement of semester I students. Based on the conducted one way ANOVA test, it shows that $F_{count} = 72.789$ is greated than $F_{table}(0.05; 2.78) = 3.114$. Because $F_{count} > F_{table}$, then the H_0 is rejected and H_a is accepted which means that there is significant effect of experimental, computer-based multimedia, and conventional learning method on General Biology learning achievement. This decision making is also strengthened by the test significance (Sig.)= 0.000 which is less 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			

Furthermore, the effect of these three learning methods on General Biology learning achievement is calculated using determination coefficient using formula R^2 = *JK(A)/JK(T).* Based on the determination coefficient calculation, it obtains $R^2 = 0.651$. This means the learning factor can explains that 65.1 % is affected by General Biology learning variation, and the rest 34.9 % is certainly affected by the other factors that are not studied in this research.

Because the tabulation result of ANOVA test shows Ha is accepted (there is effect), then the next test (*Post Hoc Tests*) is conducted. The function of this function is to see which group is different. Based on the tabulation of *homogeneity test of variances* shows that the data variance of three groups are same, then the used next test (*Post Hoc Tests*) is Bonferroni test.

Experiment method with computer-based multimedia shows the value of Sig.(0.001) < α(0.05); Ho is rejected and Ha is accepted. This shows that there is significant difference of the General Biology learning achievement average of the student group which is taught using experimental learning method and the student group which is taught using computer-based multimedia. This is due to the one of the advantages of experiment method according Sumantri (1999: 158) is lesson is mastered and memorized well by the students who are directly involved in a General Biology learning in this case practicum; compared with the learning using computer-based multimedia which the students only see and listen a lesson material presentation without involved directly in an experiment.

The experiment learning method with the conventional learning method has the value of Sig.(0.000) < α(0.05). This means there is significant difference of the General Biology learning achievement average of the student group which is taught using experimental method and the student group which is taught using conventional learning method. At the third hypothesis test, Ho is rejected and Ha is accepted. The computer-based multimedia with conventional learning method has the value of Sig.(0.000) < α(0.05). This means that there is significant

difference of General Biology learning achievement average of the student group which is taught using computer-based multimedia and the student group which is taught using conventional learning method. At the fourth hypothesis test, Ho is rejected and Ha is accepted. Same with the opinion of Priyanto (2009), the computer-based multimedia in learning gives a new nuance to make the learning more interactive, effective, efficient, and interesting; which will certainly give direct impact to the students' learning achievement that become more optimal.

4. Conclusion

Based on the analysis result and discussion, then it may be concluded that:

1. There is significant effect of experimental, computer-based multimedia, and conventional learning method on the General Biology learning achievement, with F_{count} (72.789) > F_{table} (3.114). The 65.1 % of students' learning achievement is affected by General Biology learning variation.
2. There is significant difference between General Biology learning achievement average of the student group who is taught using experimental learning method and the student group who is taught using computer-based multimedia, with Sig. value (0.001) < α (0.05).
3. There is significant difference between General Biology learning achievement average of the student group who is taught using experimental learning method and the student group who is taught using conventional learning method, with Sig. value (0.000) < α (0.05).
4. There is significant difference between General Biology learning achievement average of the student group who is taught using computer-based multimedia and the student group who is taught using conventional learning method, with Sig. value (0.000) < α (0.05).

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