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The Effect of Utilization of Mysql On The Results of Student Learning In Subject of Data Basis

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ABSTRACT
This study aims to determine: (1) differences in learning activities between students who use MySQL and students who use Ms. Access on subjects in Database Processing with basic competencies in understanding language in class XI of the RPL Department of SMK 2 Surabaya; (2) differences in learning outcomes between students who use MySQL and students using Ms. Access on Database subjects with basic competencies in understanding language in class XI of the RPL Department of SMK 2 Surabaya.The research design used was a "non - equivalent control group design" design which involved two classes, namely XI RPL1as an experimental class with a total sample of 33 students and class XI RPL-2 as a control class with a total sample of 34 students. The place of research was conducted at SMK Negeri 2 Surabaya. The study found that: (1) learning activities for students who studied using MySQL applications were significantly higher than the learning activities of students who studied using Ms. Access; and (2) learning outcomes for students who learn using MySQL applications are significantly higher than the learning outcomes of students who study using Ms. Access.

Keywords*: MySQL; Database; Learning; Outcomes; Vocational students.*

INTRODUCTION

In order to improve the quality of the learning process, teachers must be able to choose, utilize and develop learning media in line with the development of science and technology so that the quality of student learning outcomes increases. Media as an intermediary that delivers information between sources and recipients so that films, television, photos, radio, audio recordings, projected images, printed materials and the like (Heinich, Molenda, Russell, & Smaldino, 2002). While (Kozma, 1991) views that media is a technology that makes it easier for students to learn so that their learning outcomes become better. Media is anything that can convey and channel messages from a planned source, so as to create a conducive learning environment where the recipient can carry out the learning process effectively and efficiently (Munadi, 2013). Therefore, learning media must always keep up with existing technological advances, so that student and teacher competencies can develop in

a better direction (Courville, 2011). The accuracy of the selection and use of instructional media is very important and necessary in the learning process in the classroom.

One of the subjects in the Department of Software Engineering (RPL) is "Implementing the Use of Databases", which aims to provide knowledge, attitudes, and skills for vocational students so that they have competencies in accordance with the needs of the business/ industry and society. Competence is basic knowledge, skills, and values reflected in the habit of thinking and acting. The habit of thinking and acting consistently and continuously can enable a person to be competent, in the sense of having the basic knowledge, skills and values to do something.

Since the creation of a database requires deep mastery of how to assemble (design) a database, implement it, and test it, and how it works from a database system to be used, then the use of direct learning models in database learning is an alternative that needs to be considered. MySQL has become one of the free software database systems, making it easier for students to learn database systems, because the existing guidebook uses paid software (commercial or proprietary software). (Tilestone, 2003) in his scientific article entitled "The Importance of Media in the Classroom" concluded that more than 87% of students in the class were interested in learning using media (audio visual). Moreover, the results of Tilestone's research also revealed that 98% of information entering the brain is through the senses. Therefore, the use of learning media is the right strategy in delivering lesson material in the classroom.

More than that, (Lahiji, 2008) in his article entitled "Critical Media Education: Youth Media Production As A Space of Creativity For Lifelong Learning" concluded that good media is a medium created through a combination of observing and writing, not just about understanding only, but also able to foster creativity and productivity. The use of the right media, can influence productivity, innovation, creation, and critical thinking skills of students. But according to (Law of The Republic of Indonesia Number 19, 2002) in the first section concerning the function and nature of copyright (article 2) reads: "The Creator or Copyright Holder of cinematographic works and computer programs has the right to give permission or prohibit other people who without renting out the work for commercial interests ".

By looking at the current 2013 curriculum structure, database subjects in class XI are still at the stage of using Microsoft Office Access database applications (Ms. Access). In addition, in connection with the preparation of Industrial Work Practices conducted by class XI students at the end of semester 2. It should be before students carry out industrial work practices, already equipped with advanced database applications. Therefore, the teacher of SMK Negeri 2 Surabaya has the idea of inserting sub-topics in basic competencies in understanding the language for managing databases using MySQL database applications. Thus the suitability of Dual System Education (PSG) goals, where competencies obtained at school can be applied to actual work situations, namely by going directly to workplaces such as companies, agencies, government institutions, BUMN/ BUMD and so on in accordance with their competency provisions each. Thus MySQL becomes an alternative as a learning media for database subjects in class XI of SMK Negeri 2 Surabaya which needs to be considered by the teacher.

Based on the research background as described above, the problem is formulated as follows: (1) whether there are differences in learning activities between students who use MySQL and students using Ms.Access on Database Processing subjects with basic competencies in understanding language in class XI of the RPL Department SMKN 2 Surabaya ?; (2) is there a difference in learning outcomes between students using MySQL and students using Ms.Access in Database subjects with basic competencies in understanding language in class XI of the RPL Department of SMK 2 Surabaya? To answer this problem formulation, research is needed with the title "The Effect of MySQL Utilization on Student Learning Outcomes in Database Subjects at the Surabaya 2 Vocational High School."

As explained above, that teachers need to be aware of the importance of choosing learning media, especially related to the complex and unique learning process, the accuracy of media selection will greatly

influence student learning outcomes. Therefore, in the selection of media, consider that the learning process can take place effectively and efficiently is the main consideration. For this purpose, it is necessary to: (1) hold the right media selection so that it can attract the attention of students and provide clarity of the object being observed, (2) the learning material to be taught is adjusted to the learning experience of the students.

According to (Arsyad, 2014), several principles that need to be considered by teachers in choosing and using instructional media are: (1) there is no single media that is superior for all purposes, because one medium is only suitable for certain learning purposes, but may not be suitable for others. (2) media is an integral part of the learning process; (3) any media that is intended to be used, the ultimate goal is to facilitate student learning, so that aspects of student learning ease should be used as the main reference for the selection and use of a media; (4) the use of various media in one learning activity is not just a distraction / time-filler or entertainment, but rather has a purpose that is integrated with ongoing learning; (5) media selection should be objective (based on learning objectives), not based on personal pleasure; (6) the use of several media at the same time can confuse students, arguing that the use of multimedia does not mean using a lot of media at once, but certain media are chosen for certain purposes and other media for other purposes too; and (7) the goodness and ugliness of the media does not depend on its concreteness and abstractness, because the concrete media of its form, may be difficult to understand because of its complexity, but abstract media can provide the right understanding.Thus, it is clear that the selection and use of media in the learning process must consider the seven principles mentioned above.

Based on several principles that need to be considered by the teacher in choosing and using learning media as described above, this study aims to determine: (1) differences in learning activities between students who use MySQL and students who use Ms.Access on subjects in Database Processing with basic competencies in understanding language in class XI of the RPL Department of SMK 2 Surabaya; (2) differences in learning outcomes between students who use MySQL and students using Ms.Access on Database subjects with basic competencies in understanding language in class XI of the RPL Department of SMK 2 Surabaya.

Along with the rapid development of science and technology today, teacher professionalism is not enough only with the ability to teach students, but also must be able to manage information and the environment to facilitate student learning activities (Ibrahim, 2001). The concept of the environment includes learning places, methods, media, scoring systems, and facilities and infrastructure needed to organize learning and tutoring so that students are easy to learn. Therefore the selection of learning media is an important job for professional teachers, taking into account the conditions for selecting learning media.

There are several studies related to the use of MySQL media in the learning process. (Letkowski, 2015) found that in learning business subjects with the theme "solving classical computing payroll problems in spreadsheets", student learning activities using MySQL database applications were significantly higher than students who used Ms. database application. Access. The results of the study by (Denton & Peace, 2012), also found that students who studied using MySQL had higher learning activities in learning. Student learning activities on the ability to define and manipulate databases in a text-based manner (typing), and their mastery of the material and understanding the language to manage the database, turned out to be better and more skilled. The use of MySQL encourages students to learn more actively, because they understand the language for managing databases (SQL language) through writing. In line with the results of these studies, (Vebrianto & Osman, 2011)found that the average score of learning outcomes for students using MySQL learning media was significantly higher than students who studied using conventional media. Effective and efficient use of MySQL is in line with the results of (Ghavifekr & Rosdy, 2015) research which concluded that the use of media in the learning process in the classroom is very effective and efficient for teachers and students.

Based on the findings of several studies mentioned above, the following hypotheses were formulated: (1) learning activities for students using MySQL applications were significantly higher than students who used Ms. applications Access; and (2) learning outcomes for students who use MySQL applications are

significantly higher than students who use Ms. applications Access.

METHOD

This research is an experimental research type Quasi-Experimental Design with the design of "Nonequivalent Control Group Design" consisting of two classes namely XI RPL1 as an experimental class with a total sample of 33 students and class XI RPL-2 as a control class with a total sample of 34 students. The place of the study was conducted at SMK Negeri 2 Surabaya, where the number of class XI RPL was only 2 classes, namely class XI RPL-1 and class RPL-2, so this study used a total sample.The time for conducting the study was chosen and adjusted to the schedule of ongoing learning to process the database. The research design used in this study is "Nonequivalent Control Group Design" which is one form of Quasi- Experimental Design as follows:

E O1 X1 O2

K O3 X2 O4

The first step is to do an initial test before treatment (O1, O3), then after being subjected to treatment (X1, X2) within a certain period of time a final test (O2, O4) is carried out. The steps of data collection are carried out as follows: (1) interviews with database processing subject teachers of SMK Negeri 2 Surabaya, about how the learning process, student learning outcomes and learning tools are used, and the learning model used; (2) learning outcome data in the experimental class and control class were obtained through the results of the pretest and posttest results; and (3) student learning activity data obtained through teacher observation/ assessment when the learning process takes place.

The research procedure is carried out through 3 stages, namely: (1) the preparation stage, the implementation stage; and (3) data analysis stage and final report. In the preparation stage: (1) direct observation is made to the school; (2) preparation of research proposals; (3) preparation of research instruments consisting of pretest questions, posttest questions, and student learning activity observation sheets; (4) preparation of learning devices; and (5) validation of research instruments and instruments. The implementation phase includes: (1) giving pretest questions to the experimental class and the control class to know the initial ability before being given treatment; (2) the implementation of the experiment, the teacher gives treatment using the MySQL application, while the control class uses the Ms. application. Access; (3) the teacher gives the posttest questions to the experimental class and the control class with the same questions to find out the student learning outcomes; and (4) observation of student learning activities in the application of the use of MySQL applications when learning takes place. In the final stage are: (1) tabulation of data; (2) analysis of data obtained from research results; and (3) and compile research reports.

RESULTS

This research was conducted as an effort to determine the effect of MySQL applications and Ms. Access on database processing subjects by applying direct learning models to obtain data about student learning activities; and (2) student learning outcomes. The learning outcomes referred to in this study are the cognitive outcomes of learning outcomes. Scores of student learning activities as shown in Table 1.

Table 1. Student learning activities Score

Subject	**Average Student Learning Activity Score**	
	Using MySQL	Using Ms. Acces
Score	77.37	63.64
Category	Very Active	Active

Based on Table 1 above, it can be seen that learning activities for students who learn by using the MySQL application are higher than the learning activities of students who study using Ms. Access. To find out whether the difference was significant, Independent Sample t-test was used. Before the Independent Sample t-test was held, assumption tests were carried out, namely the normality test and homogeneity test. Data normality test was carried out using the Kolmogorov-Smirnov test, while the homogeneity test was carried out using

"homogeneity of variance test". Both the normality test and the homogeneity test were carried out with the help of SPSS 24 software. The results of the normality test are shown in Table 2 below.

Table 2. Results of Normality Test for Learning Activity Data (Experimental Class and Control Class

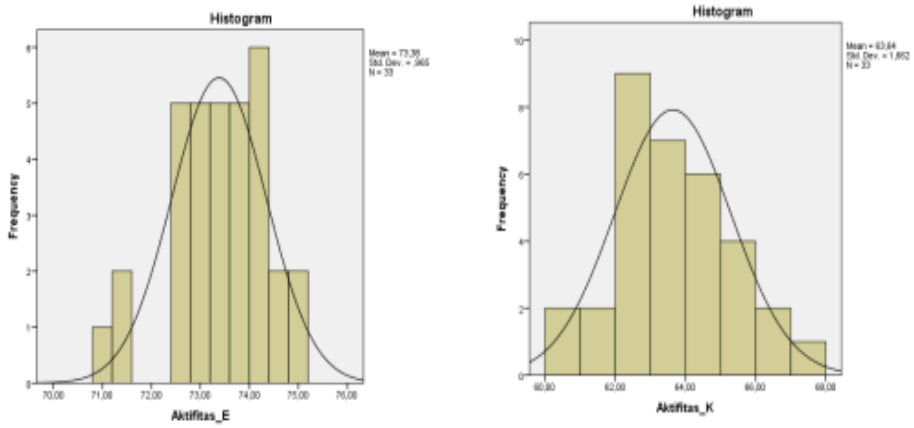
One-Sample Kolmogorov-Smirnov Test

Learning Activities Score			
Experimental Class Control Class			
N		33	34
Normal	Mean	77.37	63.64
Parameters a,b std			
	Deviation	2.610	1.382
Most Extreme	Absolut	.151	.117
Differences	Positive	.151	.117
	Negative	- .095	- .105
Test Statistic		.151	.117
Asymp. Sig. (2-tailed)		.073[c]	.190[c]

a. Test distribution is normal
b. Calculate from data
c. Lilliefors Significance Correction

Based on Table 2, it can be seen that the significance level of the average score of student learning activities in the experimental class is 0.073>0.05 and the significance level of the learning activities of the control class students is 0.190>0.05. Thus it can be concluded that the learning activities of the experimental class students and the control class are normally distributed. The histogram of the two learning activities (experimental class and control class) as shown in Figure 1 below.

Figure 1. Histogram of Student Learning Activities (Experimental Class and Control Class)



Furthermore, the homogeneity test results on student learning activity data were carried out by the "homogeneity of variance test", as shown in Table 3 below.

Table 3. The homogeneity test results on student learning activity data.

Test of Homogeneity of Variances

Levene statistic	df1	df2	sig.	status
2.885	1	65	0.091	homogen

The test criteria used in Table 3 are if the F_{count} price is obtained at a significance level of <0.05,then the variance of the data group is not homogeneous, and vice versa if the price of F_{count} is at the significance level> 0.05, then the data group variance is homogeneous. Based on the test results as shown in Table 3, the F value = 2.885 obtained at the significance level of 0.091 (0.091> 0.05), which means that H0 is accepted, and H1 is rejected, so it can be concluded that the learning activity data from the experimental class and control class is homogeneous. To analyze whether the learning activities of students who use the MySQL application are significantly higher than the learning activities of students who use the Ms. Access, the Independent Sample T-test is used. The test results of the learning activity data from the experimental class and the control class using the Independent Sample T-test as shown in Table 4 below.

Table 4. Results of Learning Activity Hypothesis Testing

Independent Sample T-test

	T-test for Equality of Means					
					95% Confidence interval of the diff	
	T	df	sig.(2-tiled)	Mean Diff	std. Error Diff	
						Lowerupper
ValueEqual variances	-6.675	65	0.000	-9.20612	1.30526	-11.89205 -6.48899
Activities assumed equal						
ofVariances not						
LearningNot-assumed	-6.675	59	0.000	-9.20612	1.30526	- 11.8901 -6.48876

Based on Table 4, there is a significant level of 0,000 <0,05, then the hypothesis H0 which reads: there is no difference in learning activities between students using the MySQL application and students using the Ms. application. Access is rejected, and Ha's hypothesis which reads: learning activities for students using MySQL applications are significantly higher than students who use Ms. Access, accepted.

Furthermore, based on the tests given, the average score of learning outcomes obtained from the experimental class and the control class as shown in Table 5 below.

Table 5. Average Score of Student Learning Outcomes(Experiment and Control Class)

Subject	Score Average Student Learning Outcomes	
	Using MySQL	Using Ms. Access
Pretest	37.32	33.07
Posttest	80.82	73.37

Normality test was carried out using the Kolmogorov-Smirnov test, while the homogeneity test was carried out with "homogeneity of variance test". Both the normality test and the homogeneity test were carried out with the help of SPSS 24 software. The results of the normality test of learning outcomes data as shown in Table 6 below.

Table 6. Normality Test Results of Learning Outcomes Data (Experiment classand Control Class).

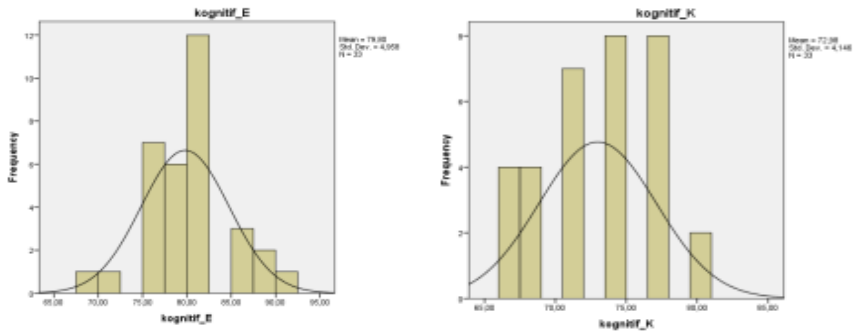
One-Sample Kolmogorov-Smirnov Test

TheScore of learning outcomes			
		Experiment Class	Control Class
N		31	38
Normal Parametersa,bstd	Mean	80.82	73.37
	Deviation	2.605	1.381
Most Extreme Differences	Absolut	.149	.118
	Positive	.149	.118
	Negative	- .096	- .104
Test Statistic		.149	.118
Asymp. Sig. (2-tailed)		.075c	.191c

a. Test distribution is normal
b. Calculate from data
c. Lilliefors Significance Correction

As shown in Table 6, that the significance level of the average score of the experimental class posttest results is 0.075> 0.05 and the significance level of the average score of the posttest results of the control class is 0.191> 0.05. Thus it can be concluded that the learning outcomes data from the experimental class and the control class are normally distributed. Histogram of student learning outcomes data from the experimental class and control class as shown in Figure 2 below.

Figure 2. Histogram of Student Learning Outcomes (Experiment & ControlClass)



Furthermore, the results of the homogeneity test on student learning outcomes data were carried out with "homogeneity of variance test", as shown in Table 7 below.

Table 7. Homogeneity Test Results on Data Results Learning (experimental class and control class)

Test of Homogeneity of Variances

Levene statistic	df1	df2	sig.	status
2.987	1	65	0.089	homogen

The test criteria used in Table 7 are if the F count price is obtained at a significance level of <0.05,then the variance of the data group is not homogeneous, and vice versa if the price of F_{count} depends on the significance level> 0.05, then the various groups of data are homogeneous. In Table 7, the amount of F_{count} = 2.987 is at a significance level of 0.089 (0.089> 0.05) which means that H_0 is accepted, and H_1 is rejected, so it can be concluded as learning outcomes data from the research class and the control class is homogeneous. The learning for students using the MySQL application is higher than the learning activities of students who use the Ms. Access, used "Independent Sample Test". Test results on the learning outcomes of the experimental class and control class using the "Independent Sample T-test" as shown in Table 8 below.

Table 8. Results of Testing Learning Hypothesis

"Independent Sample t-Test"

t-test for Equality of Means								
						95% Confidence interval of the diff		
		T	df	sig.(2-tiled)	Mean Diff	std. Error Diff	**Lower**	**upper**
Value of Learning Outcomes	Equal variances assumed equal	-6.675	65	0.000	-9.20612	1.30526	-11.89205	-6.48899
	Variances not Not-assume	-6.675	59.898	0.000	-9.20612	1.30526	- 11.8901	-6.48876

Based on the results of testing the hypothesis with "Independent Sample T-test as shown in Table 8 that the significance level obtained is 0,000, while the level of significance that has been set is equal to 0.05.Because the significance level is 0,000 <0.05, the hypothesis H_0 which reads: there is no difference in learning outcomes for students who learn by using the MySQL application and students learning using the Ms. application Access is rejected, and ha's hypothesis (H_1) reads: learning outcomes for students who learn by using the MySQL application are significantly higher than students who study using the Ms. application Access, accepted.

Discussion

This study found that learning activities for students using MySQL applications were significantly higher than students who used Ms. Applications Access. Good media is a media created through a combination of observing and writing activities, so as to foster creativity and productivity. The use of appropriate media, can affect productivity, innovation, creation, and critical thinking skills of students (Lahiji, 2008).

The results of this study are in line with the findings of (Letkowski, 2015), who concluded that in learning business subjects with the theme "solving the problem of classical computing payroll in spreadsheets", student learning activities using MySQL database applications were significantly higher than

students who used applications Ms. database Access. The results of this study also support the results of the study of (Denton & Peace, 2012), who found that students who learn using MySQL have higher learning activities in learning. Student learning activities the ability to define and manipulate databases in a text-based manner (typing), and their mastery of the material and understanding the language to manage the database, turned out to be better and more skilled. Thus it is proven that the use of MySQL turns out to encourage students to learn more actively, because they understand the language to manage databases (SQL language) through writing. The results of this study reinforce the results of the study of (Vebrianto & Osman, 2011) who found that the average score of learning outcomes for students using learning media was significantly higher compared to students who study using conventional media. Effective and efficient use of MySQL is in line with the results of (Ghavifekr & Rosdy, 2015) research which concludes that media in the learning process in the classroom, is very effective and efficient for teachers and students.

The results of this study are in line with the results of (Letkowski, 2014) study, which found that database learning can be done well through MySQL database applications. The results of this study support the policy that most database textbooks target database design and implementation for information system curricula supporting database systems (Oracle, MS SQL Server, DB/2, etc.). In connection with the most important aspects of database management is the form of design and implementation. Something that cannot be ignored is that the most widely used MySQL is open source, the relational database management system developed in Sweden in 1995 and now owned by Oracle Corporation. Thus, students' ability to learn the database using MySQL is one of the right applications in learning.

Furthermore, this study also found that learning outcomes for students who studied using MySQL applications were significantly higher than students who studied using Ms. Applications. Access.The results of this study provide guidance to teachers that the selection of media as a support in the learning process is important, because the accuracy in choosing learning media will greatly influence the quality of the learning done. Quality learning requires teacher resources that are capable and ready to play a professional role in the school and community environment ((Heinich et al., 2002). In the era of rapid development of science and technology today, teacher professionalism is not enough just to be able to teach students, but also must be able to manage information and the environment to facilitate student learning activities (Ibrahim, 2001). The concept of the environment includes learning places, methods, media, scoring systems, and facilities and infrastructure needed to organize learning and tutoring so that students are easy to learn.

Therefore the choice of learning media must be an important job for professional teachers, taking into account the conditions for selecting learning media (Arsyad, 2014) including: (1) there is no single media that is superior for all purposes , because one medium is only suitable for certain learning purposes, but may not be suitable for another; (2) media is an integral part of the learning process; (3) whatever media you want to use, the ultimate goal is to facilitate student learning; (4) the use of various media in one learning activity is not just a distraction / time-filler or entertainment; (5) media selection should be objective (based on learning objectives), not based on personal pleasure; (6) the use of several media at the same time can confuse students; and (7) the goodness and ugliness of the media does not depend on its concreteness and abstractness, because the concrete media of its form, may be difficult to understand because of its complexity, but abstract media can provide the right understanding.

The results of this study support the findings of (Wright, Borg, & Lauri, 2015) in his journal entitled "Media Education as a tool to promote critical thinking among students" which concluded that learning media were able to provide assistance to students to understand new concepts. Learning media provide new knowledge and expertise for students, so students can easily obtain new experiences based on the concepts being studied. In addition, the results of this study are also in line with the findings of (Sumarti, Pargito, & Trisnaningsih, 2014) who concluded that the use of audio visual learning media was able to increase the average score of knowledge competencies by 80.66. Moreover, learning media in the form of e-learning will be very helpful in the learning process of students, because it has several advantages as follows: (1) is a learning media that can be utilized wherever and whenever; (2)

materials and tasks are easily accessible; and (3) fluently in communication and discussion, both between students and with teachers (Soeparno & Muslim, 2018). But (Lahiji, 2008) reminded in his research report entitled "Critical Media Education: Youth Media Production As A Space of Creativity for Lifelong Learning" which concluded that good media is a medium created through a combination of observing and writing activities, so that the right media is media that can influence productivity, innovation, creation, and critical thinking skills for student.

Other studies on the effect of media use on the learning process include (Ziden & Rahman, 2013) with the title "The Effectiveness of web-based multimedia applications in teaching and learning simulation" found that: (1) virtual simulation allows students to interact with virtual environments which is similar to the real environment; and (2) the use of virtual help simulations can improve student learning achievement on the topic of pilgrimage. The results of this study are in line with the findings of (Leow & Neo, 2014) with the title "interactive multimedia learning: innovating classroom education in Malaysia University which found that: (1) there was a significant increase in test results from students; (2) student attitudes become more positive so they are more active in learning.

The results of this study support the findings of (Kaewkiriya, 2013) with the title "A design and development of e-learning content for multimedia technology using multimedia games" which concluded that: (1) multimedia games make learning more interesting; and (2) the test results of those who study with e-learning are significantly higher than students who study with conventional models. Other studies that are in line with the findings of this study are conclusions from the (Sarrab, 2015) entitled "M-learning in education: Omami undergraduate students prespective" which concluded that: (1) students' positive attitudes towards M-learning utilization increased; and (2) student learning outcomes increase significantly. While the research findings of (Surjono & Dwi, 2015) with the title "the effects of multimedia and learning styles on student achievement in online electronics courses" which concluded that students whose multimedia preferences and learning styles were in accordance with the material presented in electronic courses through online, had scores that significantly higher than the inappropriate learning model.

The results of this study also support the research findings of (Haryawan, 2014) with the title development of Adobe Flash CS6-based learning media to improve motivation and learning outcomes in assembled language programming courses in Surakarta Politama "which concluded that the use of Adobe Flash CS6-based learning media had a positive effect on motivation and student learning achievement, where: (1) the score of motivation of the experimental group students (72.87) was significantly higher than the control group (68.66); (2) the posttest score of the experimental group (76.33) was significantly higher than the control group (73.17).

CONCLUSIONS AND SUGGESTIONS

Based on the results of the research and discussion, conclusions can be drawn as follows: (1) learning activities for students who learn using MySQL applications are significantly higher than the learning activities of students who study using Ms. Applications Access; (2) learning outcomes for students who study using the MySQL application are significantly higher than the learning outcomes of students who study using Ms. Applications Access.

Based on the discussion of the results of the research and conclusions above, it is suggested as follows: (1) for vocational school teachers productive subjects, especially in multi application majors, it is recommended to use MySQL applications in the learning process, because MySQL applications in learning are proven to improve learning activities and results student learning; and (2) for other researchers, it is necessary to conduct similar research for other subjects, so that it can be known, which application is suitable for the subject in question.

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