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The Effectiveness Test of the Hybrid Learning Model based on the Learning Management System Using Statictical Analysis

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Abstract. Hybrid learning model is the combination of onsite learning and online learning model. Hybrid learning model is an interesting issue in order to balance the drastically change of learning model to the learning model of ICT-based. This study was analyze the effectiveness of hybrid learning model on the student. The test were carried out before and after the learning model applied. The data was picked up from the questionnaire. The sample consisted of 40 students. By using statistical analysis, we obtain that the average difference between the pre-test and post-test scores was -29.03175. In the t-test, Ho: pre-test = post-test gives a T value = -33,890 with 39 degrees of freedom. The p-value for the two-tailed test is 0.000 less than = 0.05. It was proved that the average pre-test and post-test scores are significantly different. It means the application of the hybrid model learning is effective. The implication of research is to encourage the use of e-learning technology to improve academic learning outcomes.

INTRODUCTION

The development of Information and Communication Technology (ICT) in the era of globalization is unavoidable. The education system utilizes ICT for ease of learning. The transfer of the learning system to ICT-based learning cannot be drastically changed. So, the learning method that combines on-site learning and online learning, called hybrid learning [1,2] is an important concern. This topic really needs to be studied before it is applied on masse. In general, hybrid learning was define as an integration of the conventional learning with web-based online approaches, combination of the media and textbooks in the e-learning environment, and combination of several teaching and learning approaches with any technology [3]. hybrid learning is an integration between instructional teaching methods and face-to-face learning with an online approach [4-7]. The hybrid learning approach is an e-learning model with synchronous and asynchronous work that aims to complement each other and improve the whole learning experience [6].

In previous study [8,9], by hybrid learning model, the students were improve their cognitive skills than conventional model. Hybrid learning is not only accepted but highly favored by students; students accept new technologies quickly and learn easily [10,11]. Therefore, hybrid learning model is a promising solution in improving learning for college students [12–14]. By applying the hybrid learning model, maybe the learning style is more cozy, no pressure and compulsion. In addition, this learning model provides a realistic practical opportunity for lecturers and students to study independently, rewarding, and evolving. Face-to-face classes can engages students to more interactive, the online portion gives students to easy access anytime and anywhere.

However, in some reason, internet facilities in Indonesia are not the same in every region. Therefore, the effectiveness of this learning model is an urgent issue that should be solved. The detail analysis in this work will be

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useful to determine which learning model is more needed for students, especially the student of State Islamic University of Manado.

RESEARCH METHOD

The procedure of research includes collecting data from questionnaires, analyzing, and making conclusions [15]. Quantitative method used to collect and analyze data. The questions were made based on summarizing, interpreting and evaluating the literature related to the research. The questionnaire was reviewed by experts before being distributed to respondents [16]. The questionnaire contains hybrid learning on the effectiveness of student learning. The questionnaire was distributed before (pre-test) and after (post-test) applying the hybrid learning model.

The research was conducted at the Manado State Islamic Institute (IAIN Manado) in 2019. The number of respondents was 40 students consisting of 20 students in class A and 20 students in class B. The data were analyzed using the Statistical Package for Social Sciences (SPSS) version 22. The analysis includes descriptive and inferential analysis. Descriptive analysis to analyze the frequency and percentage of the population in the demographic background. In addition, mean, standard deviation, frequency, and percentage were calculated to determine the effectiveness of the hybrid learning model.

RESULT AND DISCUSSION

Hypothesis Determination

Normality test is statistical calculation to test whether the data have normal distribution or not. The techniques of normality test using *Liliefors test.* The statistical hypothesis for normality test

H_o: Normally distributed data,

H_1: Non-normally distributed data.

The H_o is rejected if the value of $L_{count} > L_{table}$ at a significant rate of $\alpha = 0.05$ which means data was derived from a population that doesn't normally distributed. On the other hand, H_o is accepted if the value of the $L_{count} > l_{table}$ at a significant level of $\alpha = 0.05$ means that the data was derived from a population with a normal distribution.

Normality test of pre-test data

Pre-test is data of student's score before the hybrid learning model was applied. The average value of pre-tests was 52.48 and the deviation value (SI) was 9.0361. To determine the normal cumulative probability of F (zi) and the probability of the cumulative empiric S (zi). The normal cumulative probability and a large probability (L_{count}) = 0.96191. A number of sample is 40 and the 0.05 status of L table = x = 0886/($\sqrt{}$ 40) = 0.14010. The result of the calculation appears that at a significant level of 0.05 $L_{count} < L_{table}$ (0.96191 < 0.14010) which means zero hypothesis is accepted. The conclusion of pre-test data was derived from the normal distribution of population.

Normality of final test (post-test)

The post-test data is the students' score data after the hybrid learning models was applied. The average score (post-Test) was 81.51 and the default deviation value (SI) was 8.74259. Furthermore, it determines the normal cumulative probability of F (zi) and the probability of the cumulative empiric S(zi), based on the results of the normal cumulative probability and the cumulative probability of empirical value results (post-Test) students gained the greatest amount of Lcount = 0.107363. Sample = 40 and the 0.05 status of L table = x = 0886/($\sqrt{}$ 40) = 0.14019. The result of the calculation appears that at a significant level 0.05 $L_{count} < L_{table}$ (0.107363 < 0.14019) which means it receives a zero hypothesis. The conclusion of the pre-test data was derived from the normal distribution population.

TABLE 1. Normality test of Post-test data

Data	Frequency	$F_{commulative}$	Z	F(Z)	S(Z)	L
59,94	1	1	-2,4673751	0,0068054	0,025	0,0181946
66,60	1	2	-1,7055872	0,0440425	0,05	0,0059575

Data	Frequency	$F_{commulative}$	Z	F(Z)	S(Z)	L
69,60	1	3	-1,3624394	0,0865296	0,075	0,0115296
69,93	5	8	-1,3246932	0,0926365	0,2	0,1073635
73,26	2	10	-0,9437992	0,1726361	0,25	0,0773639
75,59	1	11	-0,6772878	0,2491117	0,275	0,0258883
76,59	1	12	-0,5629052	0,2867497	0,3	0,0132503
79,92	4	16	-0,1820113	0,4277869	0,4	0,0277869
80,26	1	17	-0,1431212	0,4430972	0,425	0,0180972
80,92	2	19	-0,0676287	0,4730406	0,475	0,0019594
82,26	1	20	0,085644	0,5341253	0,5	0,0341253
83,25	3	23	0,1988827	0,5788227	0,575	0,0038227
83,26	1	24	0,2000265	0,5792701	0,6	0,0207299
85,60	1	25	0,4676817	0,6799939	0,625	0,0549939
86,58	4	29	0,5797767	0,7189674	0,725	0,0060326
88,58	1	30	0,8085418	0,7906106	0,75	0,0406106
89,91	3	33	0,9606706	0,8316411	0,825	0,0066411
90,24	1	34	0,9984169	0,8409614	0,85	0,0090386
92,24	1	35	1,227182	0,8901229	0,875	0,0151229
93,24	5	40	1,3415646	0,9101314	1	0,0898686
Average				**81,51**		
Standard Deviation				**8,7425905**		

Homogeneity Test of Data

The homogeneity test is used *Bariett test*. The statistical hypothesis for homogeneity:

H_o: Homogeneous Sample Data

H_1: Non-homogeneous Sample Data

H_o is rejected if the value of x ² Calculator > x ² table at a significant level $\alpha = 0.05$ that means the sample data is not homogeneous. On the other hand, H_o is accepted if the value of x ² calculator < x ² table at a significant level $\alpha = 0.05$ which means the data was homogeneous. The combined sample = 1.89762 unit B = 21.7000, and the value x ² Calculator =-290.839, the value of x ² of the table at a significant level $\alpha = 0.05$ is 3.841. Then x^2 count=-290,839 < x ² table = 3.841, so it can be concluded that Ho is accepted, meaning sample data was homogeneous.

T-Test (Paired T-Test)

The effectiveness of model products developed was calculated through the analysis using SPSS which generates the following information:

TABLE 2. Paired Samples Test

		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	Of	Sig. (2-tailed)
					Lower	Upper			
Pair 1	Pre test Post test	-29.03175	5.41792	.85665	-30.76448	-27.29902	-33.890	39	.000

TABLE 3. Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre test	52.4795	40	9.03616	1.42874
	Post test	81.5113	40	8.74259	1.38232

TABLE 4. Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Pre test Post test	40	.815	.000

The data in Table 2 shows that the average difference between the pre-test and post-test scores is 29.03175. Meanwhile, the t-test of Ho: pre-test = post-test gives a T-value of -33.890 with 39 degrees of freedom. Meanwhile, the P-value for the two-tailed (2-tailed) test is 0.000 which is smaller than = 0.05. These data prove that the statistical hypothesis Ho: pre-test = post-test is rejected. The conclusion that can be drawn is that the average pre-test and post-test scores differ significantly.

The data in Table 4 also shows the correlation between the two variables of r = 0.815 and the hypothesis test data to determine the significance of the correlation p-value = 0.000. In this case, p-value = 0.000 is smaller than = 0.05, resulting in a significant Pearson correlation. Based on the data analysis above, it can be concluded that the average pre-test and post-test scores are different, this means that the hybrid learning model used by students is effective.

CONCLUSIONS

In this wotk, we applied hybrid learning model based on learning management system to students at IAIN Manado, Indonesia. The effectiveness test of this learning model was analyzed by statistical analysis using the T test, normality and homogeneity test. Based on statistical analysis, the Hybrid Learning Model has a significantly different mean pre-test and post-test scores. The correlation between the two variables is r = 0.815 and p-value = 0.000. Because p-value = 0.000 (less than 0.05), the Pearson correlation is significant, which means that the hybrid learning model is effective.

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