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The effectiveness of using learning CDs on increasing information and communication technology learning outcomes

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ABSTRACT

The era of revolution 4.0 requires educators and students to have skills that are able to compete globally. One of the skills that are becoming a trend today is digital literacy. Mastery of communication technology is one of the subjects that are able to answer these challenges. The purpose of this study was to determine the effectiveness of using Learning CDs in information and communication technology subjects. By using quantitative and design methods pseudo used in the study this is a *Randomized Two - group Design Posttest Only* analyzed with statistical formulas, it was found that the results of learning technology information and communication groups of students who are taught using learning CDs experience a significant increase.

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Introduction

Humans in their lives are surrounded by increasingly sophisticated scientific and technological developments, which demand an increase in the quality of human resources (HR). Improving the quality of human resources is supported by quality improvements in the field of education because humans themselves are the main product of education. But behind that, education is a human engineering activity, so humans are involved in determining the success and resolution of educational problems for the success and success of humans as well (Desmond et al., 2018; Graesser et al., 2018; Tang et al., 2021).

Various efforts have been made by the government to improve the quality of human resources covering almost all components of education, such as procurement of textbooks, improvement of teacher quality, learning processes, curriculum renewal, and other efforts related to the quality and quantity of education. Of these many efforts, one of the government's efforts to improve the quality of Human Resources (HR) related to the development of science and technology is computer technology as a medium of learning.

Evidence of computers as one of the media, information, and communication technology tools is that there are many things that can be done on the computer that are related to school and non-school education, and it shows clear evidence that computers are very influential on the progress of the quality of human resources in Indonesia in general and in schools in particular, which will later be ready to compete in the world of work in the era of globalization (Gómez, 2020; Ruthotto et al., 2020; Weisberger et al., 2021).

Although many efforts have been made by the government, student learning outcomes are still not very satisfactory. This problem also occurs at SMPN 4 Singaraja. Based on the results of observations at SMPN 4

Singaraja that the learning outcomes of Information and Communication Technology are still relatively low, which of the 6 existing classes only 4 students achieved an average score of 85, the score is still less than 65 which amounted to 86 students, who received sufficient value amounted to 92 students. This study used a population of 212 students spread over 6 classes. The class average also shows that only a few students are able to achieve maximum learning outcomes with the class average still in the sufficient category as shown in Table 1.

Table 1 <ICT Learning Outcomes at SMPN 4 Singaraja>

Interval Class	Description Value	Total Students
65-70	Almost Enough	86
71-75	Enough	92
76-80	More than enough	34
Total number of students		212

Seeing such ICT learning outcomes, it is necessary to apply the use of a learning model in the form of an ICT Learning CD which will later support the high quality of education at SMP Negeri 4 Singaraja. The ICT Learning CD referred to in this study is a tool for delivering messages or learning communication in the form of a CD that is intentionally made, with facilities (electronic media) that contain elements of motion and sound and contain messages that can generate initiative and the role of students in the learning process. an increase in student ICT learning outcomes in accordance with the expectations and goals of the school.

Method

The data collection method in this study used a multiple-choice ICT learning outcomes test and a practical test. Design pseudo used _ in study this is *Randomized Two - group Design Posttest only*. Design study this depicted in Table 2.

Table 2 <Design Pseudo>

R (KE)	→	X	→	0
R (KK)	→	-	→	0

Population in study this is SMP Negeri 4 Singaraja students class VII. in detail population study this presented in Table 2.

Table 3 <Data on the Distribution of Students of SMP Negeri 4 Singaraja>

No	Class	Amount
1	VII A_1	35 Students
2	VII A_2	35 Students
3	VII B_1	36 Students
4	VII B_2	36 Students
5	VII B_3	35 Students
6	VII B_4	35 Students
	Total students overall	**212 Students**

The sample taken by the researcher as the experimental class and the control class used a probability sampling technique, which is a sampling technique that provides equal opportunities for each element (member) of the population to be selected as sample members. Sugiyono, 2007 (Sutisna, 2020) the selection of the experimental class and control class is carried out with a random sampling technique.

To make the two samples equal, an equivalence test was carried out for each class that was used as the research population, namely using the equivalence t test with the following formula.

$$t = \frac{X - Y}{\sqrt{\frac{SDx}{Nx} + \frac{SDy}{Ny}}}$$

Results and Discussions

The results of the general description of students' ICT learning outcomes for the experimental group can be seen in Table 3.

Table 4 <General Description of Student ICT Learning Outcomes in Experimental Groups>

Statistics	ICT Learning Outcomes
Average	33.20
median	33
mode	30
Standard Deviation	2.53
Variant	6.40
Minimum	30
Maximum	39
Reach	9

Based on Table 3, the data on ICT learning outcomes of experimental group students had a minimum score of 30 and a maximum score of 39 so that the score range was 9. The data on ICT learning outcomes scores could be displayed in the form of a frequency table.

Table 5 <Student Group Experiment>

Interval	ICT Learning Outcomes	
	Fo	Percentage (%)
29-30	7	20.00
31-32	9	25.71
33-34	7	20.00
35-36	8	22.86
37-38	3	8.57
39-40	1	2.86
Amount	**35**	**100**

Description: fo = observation frequency

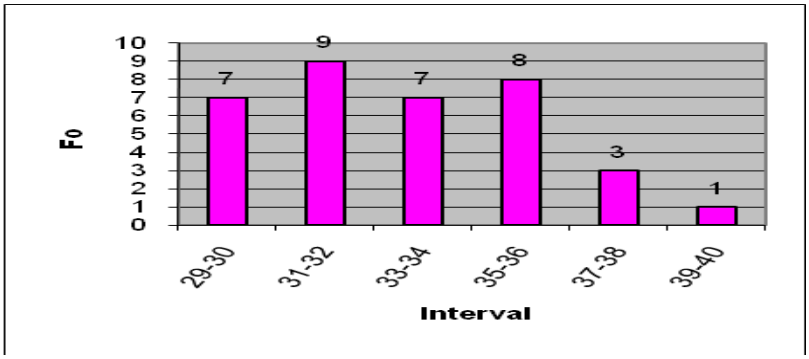

Figure 1<Interval>

Table 6 <Category of Experimental Group ICT Student Learning Outcomes>

Student Learning Outcome Score			
interval	Category	F_0	Percentage
$33 \leq \overline{X} \leq 40$	Very high	19	54.29
$27 \leq \overline{X} \leq 32$	Tall	16	45.71
$14 \leq \overline{X} \leq 26$	Currently	0	0
$7 \leq \overline{X} \leq 13$	Low	0	0
$0 \leq \overline{X} \leq 6$	Very low	0	0

Based on Table 5, it can be seen that the ICT learning outcomes of experimental group students were 54.29% in the very high category, 45.71% in the high category, and none in the medium, low, and even very low categories. The results of the general description of students' ICT learning outcomes for the control group can be seen in Table 7 .

Table 7 <General Description of Students ' ICT Learning Outcomes Group Control>

Statistics	**ICT Learning Outcomes**
Average	27.78
median	29
mode	29
Standard Deviation	2.97
Variant	8.81
Minimum	21
Maximum	32
Reach	11

Based on Table 6, the control group students' ICT learning outcomes data had a minimum score of 21 and a maximum score of 32 so that the range of scores was 11. ICT learning outcomes score data can be displayed in the form of a frequency table.

Table 8 <Distribution of Frequency and Percentage of Students ' ICT Learning Outcomes Scores Group Control>

interval	**ICT Learning Outcomes**	
	Fo	**Percentage (%)**
20-21	1	2.78
22-23	4	11.11
24-25	3	8.33
26-27	6	16.67
28-29	10	27.78
30-31	9	25.00
32-33	3	8.33
Amount	**36**	**100%**

Description: fo = observation frequency

Based on Table 6 and Figure8, it can be seen that the control group students' ICT learning outcomes scores were mostly in the 28-29 interval. The results of the analysis of the normality test of the ICT learning outcomes of the experimental group students are presented in table 9

Table 9 <Results of Analysis of Normality Test Data on ICT Learning Outcomes of Group Students Experiment>

I	**bk**	**Z**	**f(z)**	**large**	**Fe**	**Fo**	**(fo-fe)**	**(fo-fe) ^{2}**	**(fo-fe) ^{2} /fe**
29-30	28.5	-1.86	0.0314	0.1109	3.8815	7	3.1185	9.7250	2.5055
31-32	30.5	-1.07	0.1423	0.2474	8.6590	9	0.3410	0.1163	0.0134
33-34	32.5	-0.28	0.3897	0.0847	2.9645	7	4.0355	16.2853	4.4934
35-36	34.5	0.51	0.3050	0.2082	7.2870	8	0.7130	0.5084	1.2462
37-38	36.5	1.30	0.0968	0.0789	2.7615	3	0.2385	0.0569	3.4551
39-40	38.5	2.10	0.0179	0.0160	0.5600	1	0.4400	0.1936	0.3457
	40.5	2.89	0.0019						
								^{2} Count _	**12.059**
								^{2} Tables _	**12,392**
								Qualification	**Normal**

Based on Table 7 , it is obtained that the ^{2} count is 12.059 and the ^{2} table is 12.392 . Because ^{2} count < ^{2} table then $H_{0\ is}$ accepted or in other words the data on ICT learning outcomes of experimental group students is normally distributed.

Table 10 <Summary Calculation One Path Anova>

Source Variation	JK	Dk	RJK	F	F_{table}	Information
Between	521,755	1	521,755	68,466	3.978	Significant
In	525,822	69	7,621	-	-	-
Total	1047,577	70	529,375	-	-	-

Based on the results of statistical analysis, it is known that the average ICT learning outcomes of student groups taught by using ICT learning CDs is 33.20 while the average ICT learning outcomes of student groups taught by teachers as models in delivering material is 27.78. These results indicate that the ICT learning outcomes of the group of students who are taught using ICT learning CDs are higher than the ICT learning outcomes of students who are taught by the teacher as a model in delivering material.

Based on the results of the Anova analysis, the calculated F value for both groups was 68.466. The value of the F table at a significance level of 0.05 with the degree of the numerator (k-1) = 1 and the degree of the denominator (n-1) = 69 is 3.978. So, the calculated F value is greater than the table F value so that $H_{0\ is}$ rejected or $H_{1\ is}$ accepted. So it can be stated that there are significant differences in ICT learning outcomes between groups of students who are taught by using ICT learning CDs and groups of students who are taught by the teacher as a model in delivering material. The ICT learning outcomes achieved by students who were taught with ICT learning CDs were higher than the ICT learning outcomes achieved by students who were taught by the teacher as a model in delivering material.

The significant difference in learning outcomes between students who use ICT learning CDs and student learning outcomes taught by the teacher as a model in delivering ICT material is caused by differences in treatment in the learning steps. In learning to use ICT learning CDs using several media such as computers, LCDs, screens, books, and stationery but used by students, the teacher acts as a companion so that students automatically become active in following the learning process. Such learning will enable students to develop their potential optimally, both social competence and intellectual ability. Thus in the end will be able to improve learning outcomes. While in teacher learning as a model in delivering ICT material in the learning process, the teacher presents material and plays an active role supported by infrastructures such as computers, books, and stationery, without using LCD and screens, so that students become less developed in their potential and ability to interact socially.

The results of this study are in accordance with the results of research conducted by (Hanif, 2020) that there is results significant learning _ with use of CD media in learning . Next interactive CD learning could increase results study and interest study student (Nugraha & Rodiyana, 2020; Warkintin & Mulyadi, 2019). Opinion (Anggraeni, 2022; Sari et al., 2019) that learning CD could increase results study cognitive student in eye science and social studies lessons are in accordance with the theoretical studies that have been disclosed. Learning by using Learning CDs provides better ICT learning outcomes than learning in which the teacher acts as a model in delivering the material. This happens because learning that uses ICT learning CDs as a medium in delivering material can easily, save time, energy and materials, to provide ICT learning materials which will certainly attract students' interest in learning so that it will be productive in improving ICT learning outcomes. Thus, it is expected that teachers in the field of ICT studies apply learning by utilizing ICT learning CDs in delivering learning materials to students.

Conclusions

It can be concluded that there is a significant difference in ICT learning outcomes between the group of students taught by using ICT learning CDs and the group of students taught by the teacher as a model in delivering material to class VII students of SMPN 4 Singaraja. The average ICT results of students who are taught by using ICT learning CDs are higher than the average ICT learning outcomes of students who are taught by the teacher as a model in delivering material.

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