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The Effect of Cloud Classroom (CCR) on Material Energy on Communication Skill and Learning Outcome Junior High School

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Abstact

CCR is a virtual classroom that can be used for online learning and assessment. By learning to use CCR media can improve communication skills and learning outcomes. This study aims to examine the effect of using CCR on science material, especially energy, on communication skills and learning outcomes for seventh grade Junior High School students. This research is a quasi-experimental research with a post-test only control group design. The sample of this study was class VII B as the experimental class and class control class VII D. The research instrument used was a questionnaire sheet to measure communication skills and tests were used to measure learning outcomes. The data obtained were analyzed using statistical tests. The results of data analysis on communication skills were normally distributed, so that the independent sample t-test was continued to obtain a value that had a significant difference in the average score of the communication skills questionnaire of the experimental class and control class. Furthermore, the right-hand t-test was performed. The results of data analysis on learning outcomes were normally distributed so that the independent sample t-test continued to obtain a significant value for the average score of the student learning outcomes in the experimental class and the control class. Furthermore, the right-hand t-test was carried out. It can be concluded that CCR has an effect on communication skills and learning outcomes can be seen from the results of questionnaires, observations and the average score of learning outcomes.

Keywords: Cloud Classroom (CCR); Communication Skills; Energy; Learning Outcome

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INTRODUCTION

Natural Sciences is the study of events that occur in nature. Science is a science that deals with natural phenomena that produce knowledge through the learning process (Mahardika, 2019). Science learning is associated with real life which provides space to develop a scientific attitude by solving a problem and applying it in everyday life. Learning has a goal to measure a number of competencies that are expected after completion of learning. The results of the study show that the most important thing in choosing teaching materials according to the media used by the teacher is one of the learning objectives (Batubara & Ariani, 2019).

Competition in various fields of life in chapter 21 is very competitive. Education has an important and strategic role in building a knowledgeable society that has high communication skills (Priantari & Rayh, 2017). Today's 21st century, several skills are needed, one of which is communication skills. Communication skills are needed by students in conveying results both directly and indirectly to increase student activity and help students to more easily capture information or receive information. (Wati & Maulidia, 2019). However, in teacher-centered learning, students tend to be passive by only listening to the teacher's explanation and have a fear of responding or asking questions.

Communication skills are skills that a person needs in speaking, listening, overcoming barriers to verbal communication, understanding nonverbal communication from the communicant and being able to resolve conflicts constructively (Sugianto, 2017). Communication skills are developed to solve problems by discussing them with other students or asking questions with the teacher. When students have high understanding but cannot communicate what they are thinking or are unable to communicate what they are thinking, then this can hinder themselves in the learning process (Ika, 2018). There are several indicators of communication skills including: oral communication skills, written communication skills, social maturity, emotional maturity, and intellectual maturity (Kartika, 2019).

The results of the researchers' initial observations at Junior High School 1 Balen, Bojonegoro showed that students were less skilled in communication so that they had not created a learning process that was in line with expectations. This is indicated by the presence of students who are embarrassed and afraid to ask or answer questions from the teacher and in the discussion process students cannot communicate well with other students. Menurut Demirci & Yavaslar (2018) In the learning process, students must feel happy in order to create an active learning process. Active learning can be carried out well if students have good communication skills. Students need communication skills when students convey the results of the scientific process, either directly or indirectly, either individually or in groups. It can be said that communication skills have an influence on student activity, student learning outcomes, and help students to more easily capture the information conveyed by the teacher (Beni, 2020). One of the problems in education is the lack of communication in the learning process which has an impact on the high and low learning outcomes. To achieve optimal learning outcomes, it is recommended that students get used to communicating in delivering lessons, otherwise the learning process will be difficult to achieve learning outcomes (Purwanto, 2013).

Learning outcomes are a process of abilities obtained by students after taking learning activities within a certain time. In addition, it can be understood that the assessment of student learning outcomes is used to determine the extent to which students get the information that has been conveyed by the teacher (Setyorini, 2013). The factors that influence the success of students in achieving learning outcomes are divided into two, namely internal factors and external factors. Internal factors are all factors that come from within the students themselves, including the level of intelligence, interest, motivation, and so on. External factors are all factors from outside the student, including the family environment, community, association, learning facilities, social conditions, and family economy. The teacher's efforts that can be done are to develop their abilities in teaching and delivering material as well as organizing classes and

following technological developments (Mercer & Kuchel, 2017).

Learning by utilizing technology can make students more active with the use of technology that applies the use of the internet, cellphones and laptops. The role of the teacher who was initially a source of knowledge in the classroom became a facilitator in education, so learning can be done online or online using the internet. The learning process by utilizing the internet can make it easier for students to interact or communicate, socialize, and learn to express opinions (Kearn, 2020). One of the lessons that utilize the internet is e-learning which provides convenience in the form of learning that is not bound by flexible location and time, is more interactive, dynamic, face-to-face between teachers and students. (Kraochvil, 2019).

Learning with e-learning can also accommodate the learning process, teacher and student assessments, communication and administrative activities through the Learning Management System or LMS (Rafi et al., 2020). LMS is a system used to support the implementation of the learning process using Information and Communication Technology (ICT). The system is the result of a systematic integration of learning components by paying attention to learning resources, quality, and has the characteristic of learning interactions across space and time (Junaidi, 2020). One form of LMS that can be used in learning is Cloud Classroom (CCR).

CCR is a virtual classroom that can be used for online learning and assessment. CCR is a virtual space that can be accessed easily in learning activities that students use to communicate (MacLeod,2017). CCR can be accessed on the web link https://ccr.tw on google. CCR can facilitate teachers and students in the online learning process. CCR provides menu facilities, direct questions, quizzes, and the Gamified Electronic Audience Response System (GEARS). Teachers and students can interact, and students can express themselves using emojis on the CCR page. Within CCR, teachers can create various cloud classes and teachers can also create questions about tests. (Ridlo, 2020). In addition, in CCR students can ask questions about CCR without revealing the student's identity. The advantages of CCR include not requiring special installation, not requiring special equipment, being able to present questions in various types, being able to create many classrooms, presenting features for students to ask questions without showing their identity. (Ridlo, Dafik, & Nugroho 2020)

The first display on the CCR has 3 menus, namely the menu to enter as a student, and the teacher. The student display according to the picture above, students follow the instructions from the teacher, to join the class, students enter the code given by the teacher and then follow the instructions from the teacher. then the teacher displays there are many menus including the question type menu in which there are several types of questions, namely, true false, multiple choice open questions, take questions from the question bank and others. the next menu starts the quiz, downloads student answers, class settings, attendance, games, tools, rank, and a menu to choose a student to answer the question. The following display on CCR in learning can be seen in the Figure 1, 2, and 3.

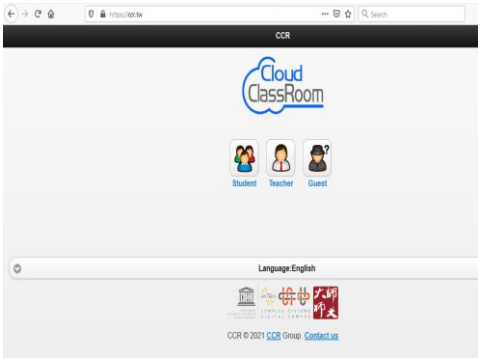

Figure 1 CCR Initial View

Figure 2 Display on Teacher

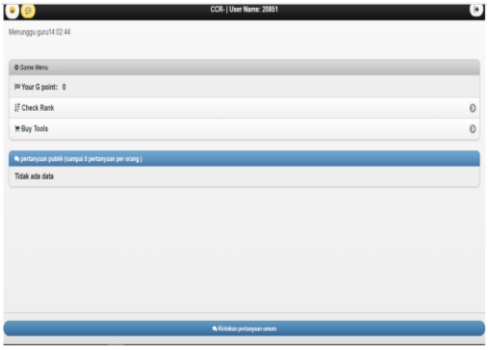

Figure 3 Display on Student

Questions in CCR are in the form of multiple choice questions, true or false, filled in or based on a question bank that has been previously made by the teacher. In making questions, the teacher can add videos or pictures. After students answer the questions posed through CCR, the system automatically presents student answers in the form of statistical data. CCR facilitates the assessment process in real time for both students and teachers, so that it has a positive impact on increasing student responses during the assessment process (Ridlo, 2020).

One of the science materials that can be integrated into CCR is energy. The concepts contained in the material can be found by students in everyday life. Energy is the ability to do work (work) or make a change. Energy is part of an object but bound to the object. Energy cannot be created or destroyed, but can be changed in form. Energy according to the International Unit is Joule (J). The types of energy are: Kinetic energy is the energy possessed by its motion. The formula for kinetic energy is denoted by the formula:

$$Ek = \frac{1}{2}mv^2 \quad \text{……(1)}$$

Description:

Ek : Kinetic energy (Joule)
M : Object mass (kg)
V : Object speed (m/s^2)

Potential energy is the energy possessed by an object because of its position or shape or arrangement. Potential energy is due to the gravitational force. An object has a large potential energy if its mass is greater and its height is higher. The formula for potential energy is denoted by:

$$EP = mgh \quad \text{…….. (2)}$$

Description:

EP : Potential energy (Joule)
M : Object mass (kg)
g : Gravity speed ($9{,}8\ m/s^2$)
h : Object height (m)

Based on the description above, it is necessary to conduct research using CCR on energy materials to improve communication skills and learning outcomes for seventh grade students of junior high school. This study aims to (1) examine the effect of using CCR on energy materials on the communication skills of seventh grade Junior High School students; and (2) to examine the effect of using CCR on energy materials on the learning outcomes of grade VII Junior High School students.

METHOD

The type of research used is a quasi-experimental design with a post-test control group design. As seen in Table 1.

Table 1 Research Design

Group	Treatment	*Post-test*
E	X	O_1
K	-	O_2

This research was carried out at Junior High School 1 Balen, Bojonegoro in the Odd Semester of the 2021/2022 Academic Year. Determination of the

sample in this study using purposive sampling. The considerations used in this study are students' ability to use technology and the availability of facilities used. The sample in this study was class VII B as the experimental class and class VII D as the control class. Data collection techniques for communication skills using a questionnaire sheet with reference to communication skills indicators. Data collection techniques for learning outcomes using test questions as many as 10 descriptions with reference to learning outcomes indicators.

The first data analysis technique is to test whether the data obtained are normally distributed or not using the normality test with the provisions (Sig)> 0.05 then the data is normally distributed and vice versa. If the data obtained are normally distributed, then proceed with the independent sample t-test and the Mann Whitney u test if the data obtained are not normally distributed. The statistical hypothesis used in the communication skills data is H_0= there is no difference in the average score of communication skills of the experimental class and control class students and H_a= there is a significant difference in the average score of the control class student's communication skills. While the statistical hypothesis used in the learning outcomes data is H_0= there is no difference in the average score of the experimental class and control class students' learning outcomes and H_a= there is a significant difference in the average control score of the control class students.

It is known that there is an average difference between the experimental class and the control class, then proceed with the right-hand t-test to better compare the experimental class and the control class. The hypothesis used by the right-hand t-test for communication skills data is $H_0 = R_1 \leq R_2$ (the average value of communication skills in the experimental class is not better than the control class) $H_0 = R_1 \geq R_2$ (the average value of communication skills in the experimental class is better than the control class). While the hypothesis used for the right-hand side of the learning outcomes data is $H_0 = R_1 \leq R_2$ (the average value of the experimental class students' learning outcomes is not better than the control class) $H_0 = R_1 \geq R_2$ (the average value of student learning outcomes in the experimental class is better than the control class). R_1 is the average of the experimental class and R_2 is the average of the control class. The decision-making criteria in the right-hand t-test are:

a. If $t_{count} < t_{table}$ then H_0 is accepted and Hadi is rejected
b. If $t_{count} < t_{table}$ then H_0 is accepted and Hadi is rejected.

RESULTS AND DISCUSSION

The data obtained from this study are the score of the communication skills questionnaire and the post-test score of learning outcomes. The frequency distribution of communication skills questionnaire scores can be seen in Table 2.

Table 2 Frequency Distribution of Student Communication Skills

Percentage	Description	Experimental Frequency(N=16)	Control frequency(N=16)
<40	Not much	0	0
40-55	not enough	0	1
56-70	enough	1	9
71-85	good	11	5
86-100	very well	4	0

Based on Table 2. shows that in the experimental class, 68.75% of students have good communication skills, while in the control class, 31.25% of students have good communication skills. the results of the questionnaire scores were higher in the experimental class than in the control class, because the experimental class used filling in via CCR while the control class used google from. The recapitulation of communication skills observation scores can be seen in Table 3.

Table 3 Recapitulation of Communication Skills Questionnaire Scores

	Lowest Score	**Highest Score**	**Average**
Experimental Class	66.67	91.67	80.31
Control Class	55.00	83.00	67.91

Based on Table 3. shows that the average score of the questionnaire results for the experimental class is 80.31 and the average control class is 67.91. The score that has been obtained from the questionnaire results in the experimental class is higher than the control class. The experimental class and control class were then tested for normality by Shapiro Wilk with the help of software version 22, which can be seen in Table 4.

Table 4 Normality Test of Communication Skills

	Questionnaire Results	**Shapiro-Wilk**		
		Statistic	**Df**	**Sig.**
Communication Skills Questionnaire	Experiment Class VII B	0.955	16	0.579
	Control Class VII D	0.922	16	0.185

Based on Table 4. shows that the significance value in the Shapiro-Wilk normality test is 0.579 in the experimental class and 0.185 in the control class. Based on the normality test, the data obtained were normally distributed. After the data obtained are normally distributed, the next step is to test the parametric hypothesis using the independent sample t-test test with the help of SPSS version 22 which can be seen in Table 5.

Table 5 Independent Sample t-test

Independent Sample t-test							
		Levene's Test for Equality of Variances		**t-test for Equality of Means**			
		F	**Sig.**	**T**	**Df**	**Sig. (2-tailed)**	**Mean Difference**
Communication Skills	Equal variances assumed	1.314	0.261	4.579	30	.000	12.56250
	Equal variances not assumed			4.579	28.685	.000	12.56250

Based on Table 5. shows that the value of Sig. (2-tailed) is 0.000. Based on the test criteria for independent sample t-test and SPSS output, it was found that the value of Sig (2-tailed) < 0.05 or 0.000 < 0.05, then H_0 was rejected and H_a was accepted. It can be concluded that there is a significant difference in the average score of the communication skills questionnaire between the experimental class and control class students. The experimental class obtained an average score higher than the control class. After knowing the data obtained there are differences, then the right side t-test is then carried out with the explained hypothesis, which can be seen in Table 6.

Table 6. Right-Party t-test Results of Communication Skills Questionnaire

Class	Average	Variance	T_{count}	t_{table}
Experiment	80.31	48.19	4.579	1.697
Control	67.91	25.31		

Based on Table 6. it shows that the results of the t-test of the right-hand side of the communication skills questionnaire with tcount of 4,579 and ttable of the t-distribution table with a significant level of 0.05 of 1,697. From the results obtained tcount (4.579) ttable (1.697) then H_0 is rejected and Ha is accepted. So it can be concluded that the average score of the communication skill questionnaire in the experimental class is better than the control class. Learning to use CCR on energy materials affects the communication skills of Junior High School students. Research conducted by Ridlo (2020) states that CCR as a virtual class can be used in the discussion learning process. Teachers can reconstruct students' concepts efficiently by utilizing the discussion process in learning, solving problems, summarizing and re-explaining material that has not been understood (Liou *et al.,* 2016).

Learning outcomes data were obtained from the test given at the end of the lesson (post-test) in the form of 10 descriptive questions that were adjusted to the learning outcomes indicators. The frequency distribution of learning outcomes test score data can be seen in Table 7.

Table 7 Frequency Distribution of Learning Outcome Score Data

Range	Criteria	Frequency Experiment (N=16)	Frequency Control (N=16)
0.00-25.00	Low	0	0
25.01-50.00	Enough	0	1
50.01-74.99	Currently	1	3
75.00-100.00	Tall	15	12

Based on Table 7 shows that in the experimental class 95.75% of students showed high learning outcomes and 75% in control showed high learning outcomes. Interactive learning with CCR states that it can achieve better post-test scores for all three dimensions of knowledge, understanding and application than the control group using traditional or conventional learning (Liou,2016). Then the recapitulation of the post-test score data on learning outcomes can be seen in Table 8.

Table 8 Post Score Recapitulation Test Learning Outcomes

Learning Outcome	Lowest Score	Highest Score	Average
Experimental Class	72	90	79.56
Control Class	50	79	65.68

Based on Table 8. shows that the average learning outcomes between the experimental class and the control class are 79.56 and 65.68 where the average score of the experimental class is higher than the control class. From the data obtained, that the learning process using CCR on energy materials affects student learning outcomes. Next, perform the normality test which is used to determine if the data obtained are normally distributed or not, which can be seen in Table 9.

Table 9 Output Normality Test Score Learning Outcome

	Class	Shapiro-Wilk		
		Statistic	Df	Sig.
Learning Outcomes	Experimental Class VII B	0.878	16	0.036
	Control Class VII D	0.820	16	0.005

Based on Table 9. shows that the significant value for the Shapiro-Wilk normality test is 0.036 in the experimental class and 0.05 in the control class. Referring to the data requirements normally distributed in the Shapiro-Wilk normality test is a significance value (sig) > 0.05 and if the data obtained is not normally distributed, so that the post test data on the experimental class learning outcomes and control class is normally distributed. After the data obtained are normally distributed, the next step is to perform a parametric test using the independent sample t-test. The statistical hypothesis used before conducting the independent sample t-test was explained in the previous chapter.

Table 10 Independent Test Output Sample t-test Post-test Score Learning Outcomes

		Levene's Test for Equality of Variances		t-test for Equality of Means			
		F	Sig.	t	Df	Sig. (2-tailed)	Mean Difference
Learning Outcomes	Equal variances assumed	39.529	.000	3.996	30	.000	13.875
	Equal variances not assumed			3.996	20.527	.001	13.875

Based on Table 10. shows that the value of Sig. (2-tailed) is 0.000. independent sample t-test test criteria, namely the value of Sig. (2-tailed) > 0.05 then H_0 is accepted and H_a is rejected and if the value of Sig. (2-tailed) < 0.05 then H_0 is rejected and H_a is accepted, so it can be stated that there is a significant difference in the average post-test scores of students in the experimental class and the control class. After knowing the data obtained there are differences, then the right side t-test is then carried out with the hypothesis that has been described in the previous chapter. The results of the right-hand t-test on learning outcomes scores can be seen in Table 11.

Table 11 Right-Party t-test Results Score Learning Outcomes

Class	Avergae	Variance	T_{count}	t_{table}
Experimental	79.56	28.99	3.996	1.697
Control	65.68	15.18		

Based on Table 11 shows that the results of the right-hand t-test of learning outcomes with tcount of 3.996 and t-table in the t-distribution table with a significance level of 0.05 of 1.697. From the results obtained tcount (3.996) ttable (1.697) then H_0 is rejected and H_a is accepted. So it can be concluded that the average score of the experimental class learning outcomes is better than the control class.

Utilization of ICT in learning is one of the keys to developing students' mastery of concepts. The use of e-learning in learning invites students towards meaningful learning so that students can practice their behavioral skills in a real and systematic way, and can make students more active during the learning

process (Dewi et al., 2020). The results of research by Liou et al., (2016) interactive learning with CCR stated that it can achieve better post-test scores for all three dimensions of knowledge, understanding and application than the control group using traditional learning.

CONCLUSION

The results showed that the use of CCR in learning has an influence on communication skills and student learning outcomes. This is indicated by the average score in the experimental class is higher than the control class in both communication skills and learning outcomes.

The use of CCR has a positive impact on increasing student knowledge because CCR provides facilities for students and teachers in the online learning process and helps teachers spend time in class to discuss more relevant topics. Assessment in CCR can be used through direct questions and quizzes besides the teacher can also interact with students by expressing emotions using emoticons.

The limitations of this research are the need for skills that can make students more active with the use of technology that applies the use of the internet, mobile phones and the limitations of this research that require skills that can make students more active with the use of technology that applies the use of the internet, cellphones and laptops.

Further research for teachers in using LMS CCR as a class management system that is more interesting and can activate the discussion process during learning without space and time limits and can improve communication skills and student learning outcomes. For further researchers, they can further investigate the use of CCR on a wider variable.

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