

Improving Learning Outcomes using Electronic-Crossword Puzzle Learning Media in Online Learning

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Abstract

It is necessary to develop learning media as learning support during the pandemic so that students' enthusiasm for learning remains high, impacting student learning outcomes. This study aimed to determine the effect of Electronic-Crossword Puzzles (E-CP) learning media on student learning outcomes in online learning. This study was experimental research. Data collection techniques were conducted through questionnaires, observations, and interviews. The samples were 32 students from a total population of 108 students of Grade X of Yogyakarta 4 Senior High School (SMA N 4 Yogyakarta). The instrument test included validity and reliability tests. The analysis technique employed two-way Anova. The results of data analysis using the independent t-test with the help of SPSS showed a significance value of $0.000 < 0.05$, and the comparison of the t-test shows $t_{count} (8.973) > t_{table} (2.048)$. It means there is a difference in the average student learning outcomes in Group 1 (students given E-CP learning media) and Group 2 (students not given E-CP learning media).

Keywords

learning outcomes; learning media; electronic-crossword puzzles; online.



I. Introduction

Learning outcomes are a picture of a student's achievement in the learning process. According to Sudrajat (2009: 22), learning outcomes are competencies owned by students after a learning experience. Learning outcomes are behaviors in the form of knowledge, skills, attitudes, information, and new cognitive strategies obtained by students after interacting with the environment in a specific learning atmosphere or condition. According to Rahma & Effendy (2013: 3), learning outcomes are the achievement of changes in behavior, behavior patterns, values, understanding, attitudes, appreciation, and skills that tend to lead to the cognitive, affective, and psychomotor domains of the learning process from time to time. Achieving learning outcomes requires various factors, including external and internal factors. Internal factors come from the students themselves, while external factors are from outside the students, such as educational facilities, devices, conditions and learning media.

Learning media has a role in improving student learning outcomes, especially during online learning. Online-based learning media strongly support online learning. Ngah et al. (2022: 2) argued that online educational technology provides an interactive virtual classroom environment, allowing students to engage with classroom efficiency without needing physical presence. The coronavirus outbreak is getting out of control, so online learning patterns inevitably must be carried out. In this case, the role of teachers is crucial to keep the learning process running as it should, even though the learning pattern changes online. According to Parsons et al. (2017: 12), teachers have an essential role in

changing learning patterns from face-to-face to online. The vision of teachers in dealing with online learning will determine the direction of the learning process working well.

The Covid-19 pandemic forces the entire education process to be performed online, regardless of previous preparations made by teachers and students. Hence, teachers and students are indirectly required to carry out the online learning process even though they have never done online learning. According to Sawai & Almaiah (2018: 4), the success of online learning methods depends on the willingness of students and a comprehensive understanding of the adoption factors and challenges of online learning systems. Students' willingness is of particular concern for the success of online learning; therefore, the readiness of students to participate in online learning needs to be prepared as well as possible. The outbreak of this virus has an impact of a nation and Globally (Ningrum et al, 2020). The presence of Covid-19 as a pandemic certainly has an economic, social and psychological impact on society (Saleh and Mujahiddin, 2020). Covid 19 pandemic caused all efforts not to be as maximal as expected (Sihombing and Nasib, 2020).

The online learning process faces challenges, one of which is the difficulty of teachers stimulating students' willingness to take part in the online learning process. There are many studies on the importance of increasing students' willingness to participate in online learning, one of which is that many students are still affected by changes in their lives before and after the pandemic (Kaufmann & Tatum (2018: 384). Yang et al. (2018 :3) argued that stimulus in learning affects cognitive aspects and affective learning engagement, which will positively impact student learning intentions and outcomes. These external factors need to be maximized to influence the cognitive aspects of students in online learning.

The cognitive aspect has become one of the things that have decreased since the implementation of distance or online learning because the willingness of students to participate in online learning is quite difficult to grow. Therefore, teachers must design strategies to foster student willingness since online learning has a positive side that can be optimized. According to Herguner et al. (2020: 102) and Pillay et al. (2007: 218), online learning is one of the exciting learning methods in the world of education because it can reach many learning resources at the same time. Students can interact with teachers and friends despite not conducting face-to-face learning. Further, it becomes a solution to the problems caused by the coronavirus outbreak.

According to (Means et al., 2009: 1), online learning is becoming popular due to its potential to support the availability of more flexible learning, where access can be done anytime and anywhere. Given the COVID-19 pandemic, learning cannot be done face-to-face; therefore, online learning makes it easier for students to access or get an education at home.

Nasution (2017: 64) stated that learning media can assist in the learning process and facilitate interaction between teachers and students, which will help students follow the learning process optimally. In selecting learning media, it is necessary to adjust the situation. In the current Covid-19 pandemic, learning is carried out online, so learning media is needed. Hamid et al. (2020: 6) conveyed that a well-designed learning media will later help students achieve the goals of the learning itself.

Electronic-Crossword Puzzle (E-CP) is an alternative to online learning in which students and teachers can still conduct a fun learning process even though they do not meet each other directly. According to (Means et al., 2009: 1), the application of technology can support various online learning models, such as using the Electronic-Crossword Puzzle (E-CP) learning media to support the online learning process. In that

way, online learning can run well because it is supported by suitable and appropriate learning media.

Online learning requires learning media that can be accessed online and makes students interested in the learning process. One media that can excite students is the Teka Teki Silang (Crossword Puzzle or CP) learning media. According to Sucianingtyas et al. (2013: 70), Crossword Puzzle is an interesting learning medium since it contains game elements and can be performed casually but can still help students understand the subject matter.

According to Dwi Ariani et al. (2014: 84), the CP learning media is helpful for reviewing the subject matter that has been delivered previously. It allows the CP learning media to help make it easier for students to understand the subject matter. This learning media was originally a learning medium that was only done directly. However, along with the development of technology, CP learning media can be done online with the help of technology so that all students can access it.

As stated by Pearson (2020: 2), Crossword Puzzle can still be a tool for attractive and communicative learning. Also, it can still be effectively used in online learning, especially during the current Covid-19 pandemic. Online crossword puzzles can be given to students as homework to review what they have learned. Students can work on crossword puzzles with their respective abilities or work together with their friends Stansfield (2014: 1). According to Mohan et al. (2018: 756) and Nicol (2020: 1), asking students to do crossword puzzles is an effective means of increasing student learning activity. It makes Crossword Puzzles learning media not only an interesting learning medium but also a learning medium that can improve student learning activity.

II. Research Method

This research used an experimental method. According to Sugiono (2018: 74), experimental research can be interpreted as a method applied to find differences in the effects of certain treatments on other treatments under controlled conditions. The data of this study were analyzed using the independent t-test to analyze the differences in the impact of the CP learning media on learning outcomes. Data analysis in this study was completed using the SPSS.16. application. Data analysis was conducted after the data was declared normal and the samples came from the same or homogeneous subject.

Criteria for decision-making were done by comparing the value of Significance (Sig.) and the value of t-count. The criteria for decision-making are as follows:

1. Suppose the value of Sig. (2-tailed) > 0.05 . In that case, H_0 is accepted, and H_1 is rejected, meaning that there is no difference in the average student learning outcomes in Group 1 (students given E-CP learning media) and Group 2 (students not given E-CP learning media). On the contrary, if the value of Sig. (2-tailed) < 0.05 , then H_0 is rejected, and H_1 is accepted, which means there is a difference in the average student learning outcomes in Group 1 and Group 2.
2. If the value of t-count $< t$ -table, then H_0 is accepted, and H_1 is rejected, which means there is no difference in the average student learning outcomes in Group 1 and Group 2. On the contrary, if the value of t-count $> t$ -table, then H_0 is rejected, and H_1 is accepted, which means there is a difference in the average student learning outcomes in Group 1 and Group 2.

III. Result and Discussion

The results of the prerequisite test for the independent t-test analysis included the normality test and homogeneity test. The following are the results of the normality and homogeneity tests from the data obtained through the tests on 32 students. Students were divided into two groups: Group 1 (students who were given treatment using E-CP learning media) and Group 2 (students who were not given treatment using E-CP learning media).

Table 1. Tests of Normality

Experimental Class		Kolmogorov-Smirnov ^a			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Learning	E-CP	0.167	16	0.200*	0.922	16	0.184
Outcomes	Non E-CP	0.201	16	0.084	0.940	16	0.352

*. This is a lower bound of the true significance

a. Lilliefors Significance Correction

Based on Table 1, the Kolmogorov-Smirnov Normality test shows a significance (Sig.) value of 0.200. It denotes that the data in the study are normally distributed. The next prerequisite test is the homogeneity test.

Table 2. Independent Samples Test

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Low	Upper
Learning Outcomes	Equal variances assumed	0.022	0.884	8.973	30	0.000	11.688	1.303	9.027	14.348
	Equal variances not assumed			8.973	29.926	0.000	11.688	1.303	9.027	14.348

According to Table 2, the Independent Samples Test in Levene's test column exhibits a significance (Sig.) value of 0.884 > 0.05. Based on the decision-making criteria, if the value of Sig. > 0.05, it can be interpreted that the data variance between Group 1 and Group 2 is homogeneous.

Based on the Independent Samples Test output in the Equal variances assumed section, the value of Sig. (2-tailed) is $0.000 < 0.005$. Referring to the decision-making criteria, if the value of Sig. < 0.05 , then there is a significant difference between the average student learning outcomes in Group 1 and Group 2.

Based on the t-count and t-table values, it can be seen that the t-count value is 8.973 while the t-table value is 2.042; thus, $t\text{-count} > t\text{-table}$. Based on the decision-making criteria, if the $t\text{-count} > t\text{-table}$ value, there is a difference in the average student learning outcomes in Group 1 and Group 2.

Difficulties in the learning process during online learning, such as the difficulty of conditioning students who do not deal directly with the teachers, are hard to overcome. Therefore, the teachers require an appropriate strategy to overcome these problems, such as using learning media following the conditions and needs of students.

Students' willingness to participate in the online learning process is relatively low; thus, it requires smart solutions to make students' enthusiasm high. With this enthusiasm, students will become more active in the learning process, and it is expected that this activity will positively impact students to improve their learning outcomes.

E-CP learning media can be an alternative learning media used in online learning. With the help of the learning media, it eases the teachers to convey learning material and, of course, makes students not feel bored or fed up with the online learning process.

Research conducted by Martell et al. (2021: 4) showed that using the crossword puzzle learning media would be one of the indicators that support student success. In this case, student success can be seen in learning outcomes following the utilization of learning media. Besides, using crossword puzzle media during learning can make learning more meaningful for students.

Marlina et al. (2021: 630) revealed that the learning process using E-CP learning media could support a good learning process, increasing student activity and collaboration between students in the learning process. Besides, using crossword puzzle learning media can improve student mastery in the form of learning outcomes improvement. According to the positive impact of crossword puzzle learning media application, the learning media can be used as an attractive alternative learning media.

It is regarded that online learning that has been carried out so far has encountered problems such as students' lack of active participation in the learning process. Finally, the E-CP learning media can be employed as a strategy or technique to improve student learning outcomes in online learning. It is considered that the E-CP learning media has several advantages that make students more active in participating in the learning process so that the learning process becomes more meaningful and fun.

IV. Conclusion

Based on the results and discussion in this research, it can be concluded that the Crossword Puzzle (CP) learning media directly influences student learning outcomes in online learning. This can be used as the basis for the importance of using Electronic-Crossword Puzzle (E-CP) learning media in improving student learning outcomes in online learning as is happening today.

The role of the teachers in the distance learning system becomes more optimal using E-CP learning media. The teachers can act as facilitators and encourage students to participate in the ongoing learning process actively. The role of the teachers in the learning process is crucial. Therefore, teachers need to use learning media according to the needs of

students so that although at this time, the learning process is performed online, it does not become an obstacle to the continuity of the learning process.

Future research can change the learning media applied or expand the topic of material following the learning media that will later be used in the learning process; of course, it should be conducted by adjusting to the material delivered and the situations and conditions that will occur.

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