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The Effect of Learning Cycle 5E with Animation Media at Student Activities and Learning Outcomes

Anna Juniar[1] and Vioni Angel Prisilya Sihombing[2*]

[1.2]*Chemistry Education, State University of Medan, Medan*

**Email: Vioniangelprisilya@mhs.unimed.ac.id*

Abstract: *This study aims to determine the effect of application of Cycle 5E learning model with animation media at learner activities and learning results. The sample was taken by random sampling of 32 learners at experiment and control room. The research was carried out by providing pre-check, after which learning material by nonelectrolyte and electrolyte solutions were applied with the Cycle 5E learning model with animation media at experiment room and the Conventional model at control class, then the posttest. From statistic processing, the following results were obtained: the average activity of learners at the experiment room was 89.76 and the control room was 80.55 with* $F_{Hitung} > F_{Table}$ *or 4.59>1.67. The average learning outcome of learners at the experiment room was 81.71 and the control room was 72.96 with* $F_{count} > F_{Table}$ *or 5.57>1.67. Correlation between learner activities and learning results of experiment room learners at the calculation* r_{count} *Retrieved* r_{count} *=0.583 While* r_{table} *at* α*=0.05 (N = 32) is 0.349. With an index determination of 0.33 with a percentage of 33%. This means that there is a correlation between learner activities and learner learning results learned by the Cycle 5E learning model with animation media at material by nonelectrolyte and electrolyte solutions.*

Keywords: *cycle 5e learning model; animation media; activities; learning results; electrolyte and non-electrolyte solutions*

INTRODUCTION

Education in Indonesia does not fully pay attention to the diversity of students' abilities. In the existing curriculum, with different characteristics, each student must be given the opportunity to have learning experiences that are appropriate to the type of intelligence they have. All students' abilities will reach the maximum to search for and investigate things (objects, people or events) systematically, critically, logically, analytically so that they can formulate their own discoveries with full confidence and can master the competencies applied in the 2013 curriculum, namely cognitive, affective , and psychomotor (Lailiah et al., 2021).

Janah stated that learning chemistry is a learning that is considered difficult by students because it covers a lot of material in a short time. These difficulties can have a negative impact on students' understanding of various chemical concepts (Janah et al., 2018). Complex and abstract concepts in chemistry make students think that chemistry is a difficult lesson. Students' difficulties in understanding chemical concepts need to be analyzed to find out the causes of these difficulties, so that

solutions can later be found (Marsita et al., 2010).

To develop 21st century skills in chemistry learning, educators can choose learning models with a scientific approach, such as discovery learning models, problem-based learning models, project-based learning models, or design-based learning models. The application of these learning models must be carried out optimally in accordance with the essence of the scientific approach in order to develop 21st century skills in students (Redhana, 2019).

One of the reasons the learning process becomes uninteresting is because teachers donot design learning models or methods and lack teachers' knowledge about the use of media and learning models that are interesting to students in learning processes. One reasonwhy the learning process becomes uninteresting is because teachers lack theknowledge and skills to design engaging learning models and effectively use media inthe classroom (Munthe & Suyanti, 2024).

Studying has an important role as a determinant of the progress of a nation and state. Studying is a conscious and planned effort to create a learning atmosphere and learning process so that learners actively develop their potential, self-control, society, nation and state. Studyingat schools is carried out through the learning process (Susilo & Widiya, 2021).

Learning is basically a process, namely the process of regulating, organizing the environment around learners so that they can grow and encourage learners to carry out the learning process (Harefa, 2020).

Of the many learning models that we know, the Cycle 5E learning model 5E learning model is a learner-centered learning model so that it can show more effective resultsat terms of understanding concepts, learning results, and time used (Nur'aini & Fatisa, 2022).

The development of the digital worldat the world of studying also has a very significant influence at the interaction pattern of educators and learners. Learners who at average have good technological literacy tend to get bored more quickly when learning is carried out conventionally (Apriansyah, 2020).

To help the learning process that will take placeat the classroom, namely by using animated videos as a companion medium for learning activities. Learning videos are a medium that presents information consisting of text, sound, and animation (Twozia, 2021).

Based at observations and interviews at Imelda Private High Schoolat Medan with a chemistry teacher, it is known that many learners do not achieve KKM = 75 because of abstract and calculation-based chemistry lessons, as well as teaching methods that only encourage memorization without in-depth understanding. Teachers use inappropriate learning models, causing less active learners to feel bored and have difficulty developing critical thinking and problem-solving skills. This needs to be improved immediately by using learning models and media that can develop learners' thinking skills, so that they can achieve better results.

LITERATURE REVIEW

Learning is a relatively permanent changeat behavior or potential behavior as a result of reinforced experience or practice (Baharudin, 2015).

The theory of Cognitivism refers to the discourse of cognitive psychology and seeks to scientifically analyze mental processes and memory structures or *Cognitionat* learning activities (Wahab & Rosnawati, 2021).

Learning results are results achievedat the form of numbers or scores after being given a learning outcome check at the end of each lesson. The grades obtained by learners are a reference to see learners' masteryat receiving subject matter (Nuraini et al., 2020).

Learning activities are learning processes carried out by teachersat such a way as to create learners to actively ask questions, question and put forward ideas (Nuraini et al., 2020).

The Cycle 5E learning model or LC for short is a learner-centered learning model. The Cycle 5E learning model is a series of activity stages (phases) that are organizedat such a way that learners can master the competencies that must be achievedat learning by playing an active role. One of the learnings that applies the constructivism model is the *Cycle 5E* learning model learning model (Vestia et al., 2022).

Media is a component of learning resources or physical vehicles that contain instructional materialsat the learner's environment that can stimulate learners to learn. Media as forms of communication, both printed and audio-visual and its equipment, thus the media can be manipulated, seen, heard, and read (Setiawan, 2022).

Animated video is a media that combines audio media and visual media to attract students' attention, is able to present objects in detail and can help understand learners (Tarigan, 2023).

METHODS

This research was carried out at Imelda Private High Schoolat Medan at Jl. Bilal Ujung No.24, Pulo Brayan Darat I Kec. This research was carried outat May, the Even Semester of the 2023/2024 Academic Year. (one pre test pos test group design)

The populationat this study is the entire room X learners of Imelda Medan Private High School which totals 92 learners consisting of 3 classes. The samplingat this study was carried out by *random sampling*, namely the determination of samples for certain reasons. The researcher determined the members of his sample by considering the same teachers, and the same length of study (number of lesson hours). The sample taken was 2 classes, namely the experiment room and the control room. Where this experiment room is taught with *the Cycle 5E learning model 5E* model with animation media and the control room is taught with a conventional model based at *scientific learning* with the help of textbooks.

The type of research used is quasi-experiment research with a random group pre test-postcheck design.

The variable sat this study are as follows:

1. The independent variables, namely the 5e cycle 5e learning model and animation media
2. Bound variables, namely learner chemistry activities and learning results.
3. Control variables, namely material by nonelectrolyte and electrolyte solutions, curriculum, pretest-pos test, and time used.

There are 2 research instruments, namely a checkat the form of multiple choice or multiple choice and a non-checkat the form of an activity questionnaire. The check questions usedat this study before being used as a statistic collection tool were first checked at other learners who were not involvedat this study with the aim of obtaining good check questions. Then the questions that were checked were analyzed to determine the validity, reliability, level of difficulty (P) and discriminating power (D) of the questions. The results of this analysis will resultat a decision whether the question item can later be used, improved, or discarded. Meanwhile, the activity questionnaire is validated first to expert lecturers whether it is feasible or not feasible to use.

The statistic analysis technique to determine the results of the research uses the T check (Hypothesis Check) with the prerequisites of normal check and homogeneity check. To check the hypothesis whether the truth is acceptable or not, the one usedat this study is a one-sided t-check, namely the right-hand t-check. With a real level *of* α = 0.05.

The t-check formula is as follows*:*

$$t_{count} = \frac{(\bar{X}1 - \bar{X}2)}{\sqrt{\left(\frac{S1^2}{n1} + \frac{S_2^2}{n2}\right)}}$$ (Rukminingsih et al., 2020)

RESULT AND DISCUSSION

The research was conducted at IMELDA MEDAN PRIVATE HIGH SCHOOL in X MIPA T/A 2023/2024. The research is carried out by teaching directly or face-to-faceat the classroom. Both classes were given a pre test to find out learners' conceptions of material by nonelectrolyte and electrolyte solutions before being taught. The questions used were 20 multiple-choice questions consisting of five choices that had previously been analyzed by instruments with validity checks, reliability checks, check difficulty checks, question differentiation checks, and detractors.at the initial comprehension check, the experiment room obtained an average pre test score of 36.87 and the control room obtained an average pre test score of 31.46 (both are relatively low).

After being given learning using the *Cycle 5E learning model 5 E model* assisted by animation mediaat the experiment class, the average score of learners experienced a significant increase, namely 81.71 and the score was an average score with a high category. Meanwhile, the average score of the control room pos test taught with the conventional model assisted by the textbook was 72.96 with a medium category obtained from the results of statistic processing of normal check, homogeneity check, n-gain check as shownat the table below.

Table 1. Pre-check normal check

Room	X^2_{count}	X^2_{Table}	A	Information
Experiment	3.45	11.07	0.05	Normal
Control	4.34	11.07	0.05	Normal

Based at Table 1, the statistic normal check can be concluded that the statistic of the pre test value of the experiment room is normally distributed.

Table 2. Pos-check normal check

Room	X^2_{count}	X^2_{Table}	A	Information
Eksperiment	8.52	11.07	0.05	Normal
Control	2.43	11.07	0.05	Normal

Based at Table 2 of the statistic normal check above, it can be concluded that the statistic of the pos test values of the experiment room is normally distributed.

Table 3. Pre-check statistic homogeneity check

Room	Varians	Fcount	Ftab	α	Add
Experiment	31.85	1.29	1.78	0.05	Homogen
Control	24.57				Homogen

Based at Table 3 above, $F_{cal} < F_{Table}$ or 1.29 < 1.78 was obtained, so it can be concluded that the pre test statistic between the experiment room and the control room is homogeneous.

Table 4. Post-check statistic homogeneity check

Room	Varians	F_{count}	Ftable	α	Information
Experiment	47.75	1.49	1.78	0.05	Homogen
Control	32.03				Homogen

Based at Table 4, $F_{cal} < F_{Table}$ or 1.49 < 1.78 was obtained, so it can be concluded that the postcheck statistic between the experiment room and the control room is homogeneous.

Because the statistic obtained has been distributed normally and homogeneously, it has qualified for hypothesis checking.

Hypothesis I check was carried out to determine the effect of the use of the cycle 5E learning model 5e model assisted by animation media at material by nonelectrolyte and electrolyte solutions at learner activities. The results of hypothesis 1 checking can be seenat Figure 1.

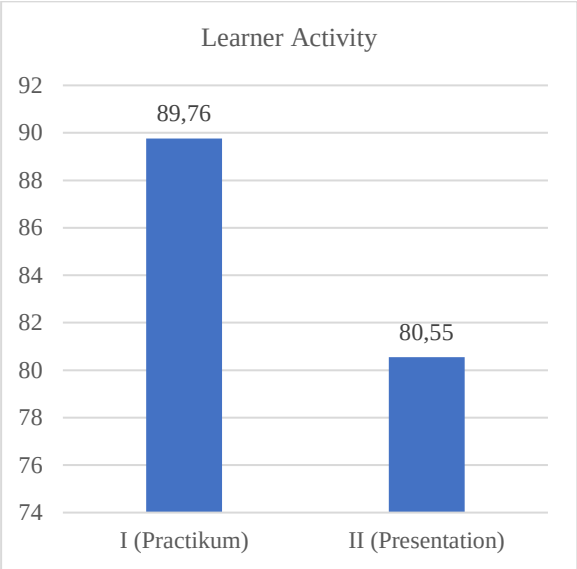

Figure 1. Hypothesis check i (learner activities)

Based at Figure 1, the average value of the first meeting is 89.76 and the second meeting is 80.55 so that t_{count} = 4,59 and t_{Table} 1,670 so that $t_{count} > t_{Table}$ then Ha was accepted and Ho was rejected. It can be concluded that there is an influence of the use of the Cycle 5E model assisted by animation media at learner learning activities. Hypothesis check II was carried out to determine the effect of the use of the cycle 5E learning model 5e model assisted by animation media at material by nonelectrolyte and electrolyte solutions at learner learning results. The results of hypothesis II checking can be seen at Figure 2.

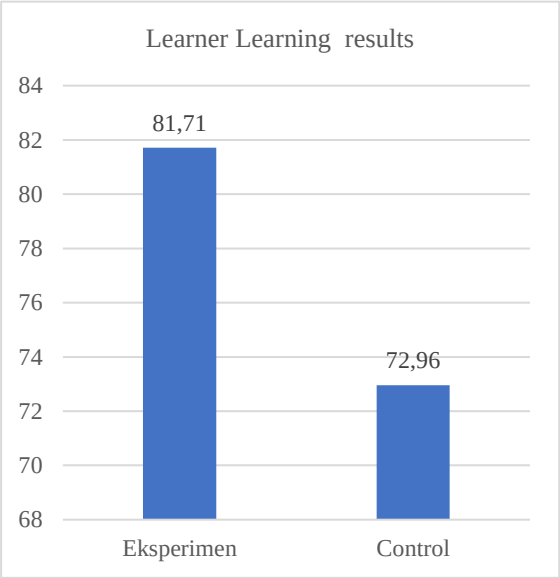

Figure 2. Hypothesis check ii (learner learning results)

Based at Figure 2, the average score of the experiment room was 81.71 and the control room was 72.96 so that t_{count}= 5.573 and t_{Table} 1.670 up to $t_{count} > t_{Table}$ then Ha was accepted and Ho was rejected. It can be concluded that there is an effect of the use of cycle 5E assisted by animation media at learner learning results at material by nonelectrolyte and electrolyte solutions.

Hypothesis III check was carried out to determine the correlation between activities and learner learning results taught using the cycle 5E learning model 5e model assisted by animation media at material by nonelectrolyte and electrolyte solutions. The results of hypothesis III checking can be seenat Table 5.

Table 5. Correlation of practicum activities with learner learning results

		Practical Activities	Learning Outcomes
Practical Activities	Pearson Correlation	1	.007
	Sig. (2-tailed)		.969
	N	32	32
Learning Outcomes	Pearson Correlation	.007	1
	Sig. (2-tailed)	.969	
	N	32	32

Table 6. Correlation of presentation activities with learner learning result

		Practical Activities	Learning Outcomes
Practical Activities	Pearson Correlation	1	-.110
	Sig. (2-tailed)		.550
	N	32	32
Learning Outcomes	Pearson Correlation	-.110	1
	Sig. (2-tailed)	.550	
	N	32	32

Based at the statistic obtained at table 5 and table 6, there is a positive correlation between learner activities and learner learning results learned with the Cycle 5E learning model 5E model assisted by animation media at material by nonelectrolyte and electrolyte solutions.

This research is in line with research conducted by Astuti, et al. in 2021 about the effect of the learning cycle 5e model assisted by animation media on colloidal materials on the learning outcomes of grade XI students Where the research was conducted in an experimental class with a control class, the learning outcomes of students in the experimental class were higher, namely with an average of 79.84 while the learning outcomes of students in the control class were lower with an average of 74.27. The similarity of the research with this study is in the model and media and the variables measured, namely student learning outcomes with the same goal to see the improvement of student learning outcomes, where in this study, the student learning outcomes (post-test) of the control class were lower, namely 72.9, while the average learning outcomes of the experimental class students were higher, namely 81.7 (Khusnaini et al., 2021).

Then the next research that supports this research is on the influence of 5E learning cycle media on psychomotor abilities and students' learning activities or activeness. conducted research in two cycles, initially students had difficulties in learning in cycle I. In cycle II, students no longer experienced difficulties in operating the equipment. This is because students are clear in understanding the instructions in the LKS. When the student practicum is seen to be active in conducting the experiment, this indicates that the student is enthusiastic and enjoys the experiment, this can be seen from the increase in the average percentage, which is 34.74% in the first cycle to 69.06% in the second cycle. This success can be said that the learning outcomes, especially in the psychomotor realm, have been successful but the improvement in the process aspect still does not meet the specified percentage of success, which is 70%, this happens due to time constraints (Purnomo, 2019).

Based on the affective and psychomotor learning outcomes, students who are taught with the Learning Cycle 5E learning model with the help of learning video media are better than the learning outcomes of students who are taught with the Learning Cycle 5E learning model. The average affective score of the two classes was quite good, where the affective score of the students of the experimental class was higher (79.92) than the control class (72.15), while the average psychomotor score of the experimental class was higher (85.25) than the control class (84.93) and the psychomotor score in both classes was good. Meanwhile, this study was carried out in two meetings, namely Meeting 1 (practicum) and Meeting 2 (presentation). In the first meeting, the average student activity was 89.76 and in the second meeting, the average student activity in the presentation section was 80.55. This value is classified as a good activity value, which means that the learning cycle 5e model assisted by animation media has an effect on student learning activities.

In another study that supports or is in line with this study, namely the research on the influence of the 5e cycle model on student learning outcomes conducted which states that the improvement of learning outcomes shows that the problem of poor student learning outcomes can be overcome by using the 5E learning cycle learning model. With the help of this approach, students can actively engage in their education, contribute to the development of an atmosphere conducive to independent learning, and work together to improve learning outcomes. The 5E learning cycle is appropriate for hands-on content as students will observe the subject being studied while getting instructions. With direct findings embedded in their memory of the subject matter studied, this can have an impact on the development of students' scientific learning outcomes (Budianti et al., 2023).

CONCLUSION

Based at the results of the research that has been carried out, the following conclusions can be obtained:

There was an effect of using the Cycle 5E learning model 5E model with animation media at activities with a calculated magnitude of 4.59. There was an effect of the use of the Cycle 5E learning model 5E model with animation media at learner learning results with a t_{cal} of 5.573. There was a positive correlation between learner learning activities and learning results taught using the cycle 5E learning model assisted by animation media at material by nonelectrolyte and electrolyte solutions.

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