

Implementation of Innovative Learning Models in Chemistry Lessons During the Covid-19 Pandemic

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Abstract: This study aims to increase students' activeness and learning outcomes in Chemistry. It can be useful in providing an interesting and not boring learning experience for students, through blended learning, students are directly involved in learning activities, to increase student chemistry learning activity during the Covid-19 pandemic. This research is classroom action research consisting of two cycles, each consisting of four activities: planning, action, observation, and reflection. Learning activities with this blended learning model will continue to the next cycle if the indicators of success have not been achieved. The sample in this study was 32 students of class XI MIPA Jambi Medan Private High School. The study's results used a blended learning model during the Covid-19 pandemic. From the results of research and discussion that have been obtained, several conclusions can be drawn, including; In cycle I, the number of students who are in the active category is 46.88% and the very active is 9.38%, so the number of student activities is 56.26%; In cycle II there was an increase in the activity category by 37.50% and students who were very active increased by 50.00%, so that the number of student activities was obtained by 87.50%, and student learning outcomes increased with the achievement of the minimum completeness criterion score in the first cycle of 64% and in the second cycle it is obtained by 76.00%. So that the number of students' learning completeness is obtained by 84.21%.

Keywords: Innovative learning; Chemistry lessons; Covid-19 pandemic

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Introduction

Education and learning are a link that cannot be separated from one another, learning is an important part of the educational process (Anggraeni et al., 2020). To have a good quality of education, it is necessary to have a good learning concept as well (Gunawan et al., 2020). Learning activities are held to shape character, build knowledge, attitudes, and habits to improve the quality of life of students (Kurniawati et al., 2019). On this basis, the importance of learning activities that empower all potential learners to master the expected competencies. Therefore, education and learning are

very related and important for all students to get for the advancement of education (Anwar. 2017).

To achieve an expected curriculum, there needs to be a learning model which it refers to the objectives of the curriculum. Nuraeni, (2017), stated that the innovation of learning models cannot be separated from the learning curriculum. To produce a quality learning model, the curriculum used must also follow the programs in it. Aligning the learning model with the curriculum can be done by involving students or teachers in providing useful input to innovators in innovating better learning models (Haminah et al., 2019).

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At the beginning of 2020, a dangerous virus spread in Indonesia and was previously felt by the whole world before 2020 (Bai et al., 2020; Lai et al., 2020). This familiar virus is called Corona Virus Disease 2019 or known as COVID-19 (Drell, 2020). In dealing with the Covid-19 problem, the government has implemented a policy by implementing a lockdown. Where the lockdown is expected to stop the spread of this virus. Therefore, what the public can do is obey the government by following the lockdown procedures and practicing social distancing as much as possible. This condition has an impact on educational conditions that require learning to be carried out at home.

All sectors in Indonesia, especially the education sector, have been severely affected by the Covid-19 pandemic (Purwanto et al., 2020; Putri et al., 2020; Dewi, 2020). At the beginning of 2020 the world of education underwent a change, learning which was originally done face-to-face has now switched to online-based distance learning at all levels of education to prevent the transmission of Covid-19. On March 24, 2020, the Minister of Education and Culture of the Republic of Indonesia issued Circular Letter Number 4 of 2020 concerning the implementation of education policies in the emergency period for the spread of Covid19, which was addressed to all officials at the provincial and regional levels in Indonesia. In this case, the teaching and learning process is carried out through distance learning, both online and offline at their respective homes.

Child protection commission currently many students are experiencing mental stress and even drop out of school due to obstacles faced in distance learning during the Covid-19 pandemic. Therefore, a more effective and efficient learning concept is needed to support the success of learning during the pandemic. Innovative learning with blended learning can be alternative learning to reduce problems in online learning (Putra and Fitrayati, 2021). The blended learning model is learning that combines face-to-face and online learning to improve learning skills (Kurniawati et al., 2019; Lestari et al., 2016). Some schools implement a blended learning system that combines face-to-face learning by utilizing the internet as a means of assisting the learning and teaching process (Idris, 2018; Hamka and Vilmala, 2019). This model is relatively new in its application in the world of education.

Theoretically, the results of this study are expected to strengthen and support existing theories related to the blended learning model in order to increase the activity and learning outcomes of Chemistry. While the practical benefits for students are to provide interesting learning experiences through blended learning because students are directly involved in these learning activities, so that

they can increase student chemistry learning activities and results during the Covid-19 pandemic.

Method

This research is classroom action research. This classroom action research is considered very suitable to be used, because this research is focused on learning problems that arise in the classroom, in order to improve learning and improve the teaching and learning process more effectively. The population of this study was all students of class XI SMA and the samples in this study were students of class XI MIPA Jambi Medan Private High School as many as 32 students. The technique used in data collection is using a questionnaire. The data collection instrument used an observation sheet on student learning activities and a test instrument for learning outcomes as many as 30 questions which were distributed using google form.

This research consists of two cycles, where each cycle consists of four activities, namely; planning, action, observation and reflection. Learning activities with this blended learning strategy will continue to the next cycle if the indicators of success have not been achieved

Result and Discussion

The results of the observations show that learning using the blended learning model encourages students to be creative and always feel happy in participating in the learning process. At the end of Cycle I, the creativity of the students of class XI MIPA Jambi Medan Private High School in Chemistry subjects, especially in Stoichiometry material, has begun to appear. This continues to be conditioned by providing some direction so that students feel happy, relaxed, and calm in the learning process. The learning process uses the Zoom Meeting application as a face-to-face online and uses google classroom as a place for sending subject matter and assignments to all students.

The results of the research in cycle I, the average score for student learning outcomes with a percentage of 54.12% (high category). In Cycle II, the average score for student learning outcomes with a percentage of 68.23% (very high category). This shows that the blended learning model has a positive influence on the activeness of students. Student learning outcomes showed an increase from cycle I to cycle II. The posttest means value showed 53.78 in the first cycle and 78.37 in the second cycle. This can be seen in Table 1.

Table 1. The Average Value of Posttest Cycle I and II

Indicator	Cycle I	Cycle II
Average Score	53.78	78.37

The increase in the average daily test scores and the achievement of the Minimum Mastery Criteria for chemistry subjects can be seen in Figure 1. Student learning activities in cycle I was observed using an observation sheet that had been prepared. The complete data on student learning activities in cycle I can be seen in Table 2.

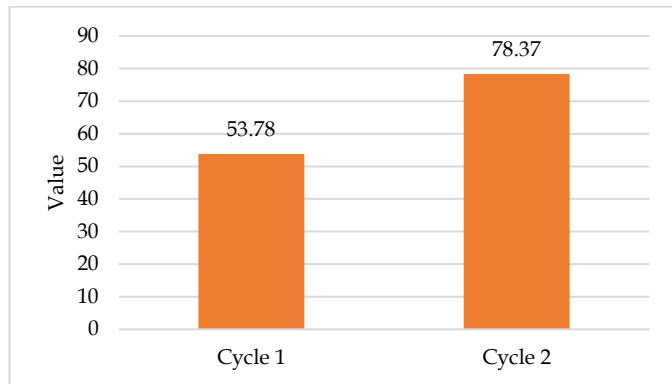


Figure 1. Posttest Mean Value and Minimum Completeness Criteria on Stoichiometry basic competence

Table 2. Results of Observation of Student Learning Activities in Cycle I

Category	Score	Total students	Percentage (%)
Not Active	0 - 59	5	15.63
Less Active	60 - 69	9	28.13
Active	70 - 79	15	46.88
Very Active	80 - 100	3	9.38
Total		32	100

Based on Table 2 above, it can be seen that with learning activities using the blended learning model, student activities in cycle I are more or less active, this is because there are still many students who have not conditioned this learning model. One of the factors is that students do not understand the use of applications and sometimes students are still lazy to collect assignments in Google Classroom. For more details, this can be seen in Figure 2.

In cycle II, they still apply the same system as cycle I, but emphasizes students in learning activities such as reprimanding students who are less active and asking questions during zoom meetings. The results of observing student learning activities in cycle II can be seen in Table 3.

Table 4. Average Student Learning Activities Through Blended Learning Model

Category	Cycle I		Cycle II		Percentage Increase (%)
	Total students	Percentage (%)	Total students	Percentage (%)	
Not Active	5	15.63	0	0.00	15.63
Less Active	9	28.13	4	12.50	15.63
Active	15	46.88	12	37.50	9.38
Very Active	3	9.38	16	50.00	40.63

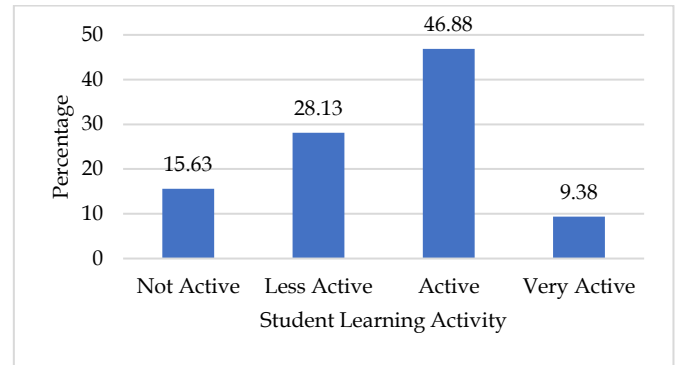


Figure 2. Percentage of Observation Results of Student Learning Activities in Cycle I

Table 3. Results of Observation of Student Learning Activities in Cycle II

Category	Score	Total students	Percentage (%)
Not Active	0 - 59	0	0.00
Less Active	60 - 69	4	12.50
Active	70 - 79	12	37.50
Very Active	80 - 100	16	50.00
Total		32	100

Based on Table 3 above, it can be seen that with learning activities using the online learning system, student activities in Cycle II are more active. For more details, this can be seen in Figure 3.

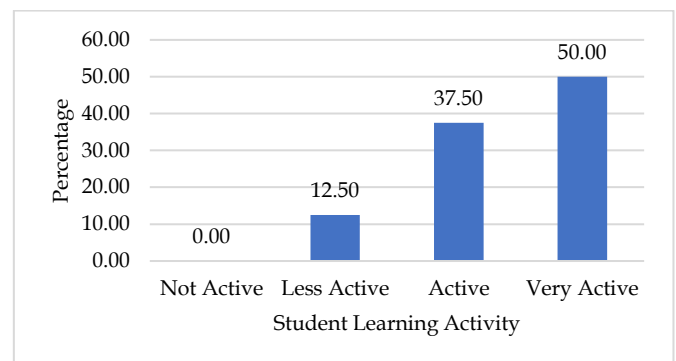


Figure 3. Percentage of Student Learning Activities in Cycle II

The results of the study and the average percentage of student learning activities in learning activities using online learning have increased in each cycle which can be seen in Table 4.

The average increase in student learning activities in online learning activities with the blended learning model in cycle I and II can be seen in Figure 4.

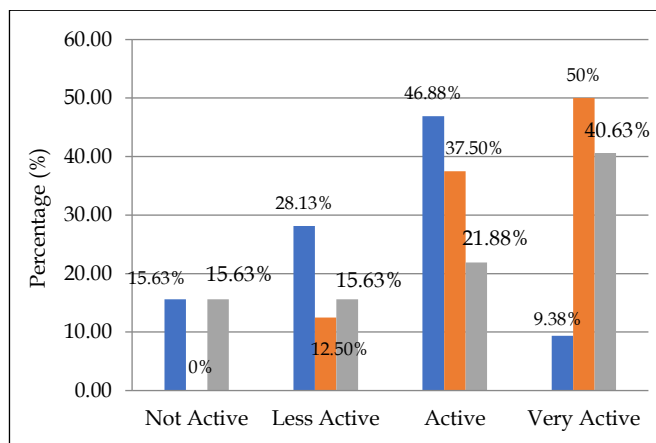


Figure 4. The Average Increase in Student Learning Activities in Cycle I and II

Based on Figure 4, it can be described that online learning activities with blended learning models in cycle II have increased, from 3 students to 16 students are in the very high category or have increased by 50.00% from cycle I, because there is an increase in the category active which decreased from 15 students to 12 students or as much as 37.50%. In the inactive category previously, there were 5 students and in this second cycle there were no inactive students. It can be said that in cycle II this has been successful because it has achieved the criteria of action set because more than 75% of all students have been in the high and very high categories that have been accumulated. This can be seen from the number of students who are in the active category as much as 37.50% and the very active 50.00%, so the number of activities is 87.50%.

The learning outcomes show the acquisition of student learning outcomes in Stoichiometry subjects using online learning in cycle I and II can be seen in Table 5.

Table 5. Average Student Learning Outcomes in Cycle I and II

Indicator	Test Value	
	Cycle I	Cycle II
Highest Score	73.00	90.00
Lowest Score	55.00	76.00
Average	64.00	76.00
Completeness Rate (%)		84.21

The results of the research and explanations show that student learning outcomes in chemistry subjects with the blended learning model have increased, this

happens because the learning process is carried out optimally by using the right steps. So that this research can prove that the blended learning model that is implemented optimally and innovates can increase student activity and learning outcomes in chemistry subjects.

Conclusion

Based on the results of the research and discussion described above, several conclusions can be drawn, namely, the optimal implementation of the blended learning model can be carried out more effectively during the Covid-19 pandemic (online). This can be seen from the results of observations of student learning activities and student learning outcomes. In cycle I, the number of students who are in the active category is 46.88% and the very active is 9.38%, so that the number of student activities is 56.26%. In cycle II there was an increase in the activity category by 37.50% and students who were very active increased by 50.00%, so that the number of student activities was obtained by 87.50%, and student learning outcomes increased with the achievement of the Minimum Completeness Criteria value at Cycle I was 64% and in cycle II it was 76%. So that the number of students' learning completeness obtained is 84.21%.

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