

Improving Student Activities and Learning Outcomes Through the Application of the Articulation Model in Science Learning

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Abstract. The articulation learning model is a learning model that requires students to be active in learning where students are formed into small groups where each student in the group has the task of interviewing their groupmates about the material just discussed. Improve student activities and learning outcomes through the application of the articulation model in science learning for grade 9.1 SMP Negeri 2 Sengkang for the 2021/2022 academic year. This research is a classroom action research. The research subjects are 16 students. Which consists of 7 men and 9 women. While the research procedure consists of 4 stages, namely: planning, implementation, observation, and reflection. Furthermore, data analysis was carried out through three stages, namely data reduction, data presentation, and data verification/conclusion. The results show that the application of the articulation model can improve student activities and learning outcomes in science learning in class 9.1 SMP Negeri 2 Sengkang in the 2021/2022 academic year.

Keywords: Learning outcomes, articulation models, science;

1. Introduction

Based on the Joint Decree of the Minister of Education and Culture, the Minister of Religion, the Minister of Health, and the Minister of Home Affairs regarding the guidelines for the implementation of learning during the Covid-19 Pandemic, it was decided that the implementation of learning during the Covid-19 pandemic was carried out with limited face-to-face learning while still implementing health protocols, and /or distance-learning.

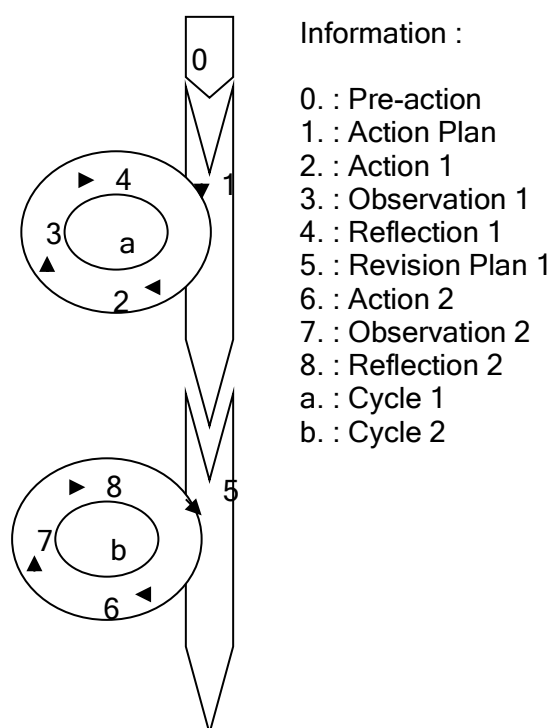
The academic year 2021/2022 is the beginning of the implementation of limited face-to-face learning. Student learning achievement during distance learning is very low and it seems that students miss face-to-face/offline learning (D. Jamaluddin, Ratnasih, Gunawan, & Paujiah, 2020; Meda, 2020). Based on the joint decision of the four ministries, limited face-to-face learning was carried out. In the implementation of limited face-to-face learning, in addition to the strict application of health protocols, of course, teachers must choose the appropriate learning model (J. Jamaluddin, Arhas, & Nasrullah, 2021). This means that the model chosen in addition to supporting the process rules, of course, can also inspire students' enthusiasm to learn which in the end can also improve their learning outcomes (Salam, 2016).

Science subjects are subjects that are familiar to students because from the elementary school level they have already received these subjects (Purwono, Yutmini, & Anitah, 2014) (Sinja, Asran, & Margiati, 2015). So that their learning achievement can be maximized in limited face-to-face learning, I as a science subject teacher choose the "Articulation" learning model. Articulation learning is a learning model that requires students to be active in learning where students are formed into small groups where each student in the group has the task of interviewing their groupmates about the material just discussed (Astrianiingsih & Prasetyo, 2018; Kasi & Sari, 2018; Nurjannah, Arafat, & Toyib, 2020; Yastiari, 2019).

2. Method

This research is a classroom action research, this research was conducted at SMP Negeri 2 Sengkang, which is located at Jalan Bau Baharuddin No. 27 Sengkang, Wajo Regency, South Sulawesi. The research design follows the Kemmis & Mc Taggart . model (Kemmis & MC Taggart, 1998) as in Picture 1.

Image 1: Research design



The research procedures are planning, implementation, observation and reflection. The research subjects were 16 students. Which consists of 7 men 9 women. The total number of students in grade 9.1 is 32 people. Because the implementation of face-to-face learning is limited, students in one class must be divided into two groups/shifts so that the research subjects are only 16 people, namely those in group A (Suprianto, Niswaty, Arhas, Rahman, & Salam, 2022). and Data analysis is carried out through three stages, namely data reduction, data presentation, and data verification/conclusion (Miles, Huberman, & Saldana, 2020).

3. Results and Discussion

As stated in the previous section that each cycle in this research consists of several stages, namely: Initial Reflection, Planning, Implementation, Observation, and Reflection. The results obtained at each stage in each cycle are described as follows:

3.1 Cycle I/Initial Reflection

The activity carried out at this stage is to determine the learning materials that are considered urgent to be handled by the teacher. The teaching material in question is Natural Science material on the basic competence of "Applying the concept of inheritance in the breeding and survival of living things".

At this stage, the researcher plans to form groups in pairs with their classmates or friends beside them.

3.1.1 Planning

A number of activities carried out at this stage include making: lesson plans, learning scenarios, preparing literature books from the library, stationery for students (namely: lined HVS paper for notes), preparing learning outcomes assessment formats according to predetermined indicators, preparing formats observations for teachers and students.

3.1.2 Implementation

The implementation of the actions in cycle 1 was carried out 1 time face to face in learning activities outside the end of the cycle test activities. In normal situations the number of lesson hours is 5 lesson hours (5 x 40 minutes) but in the implementation of PTMT the time allocation is 120 minutes, while the end of the cycle test is used for 40 minutes.

The first face-to-face meeting of Cycle I was held on Monday, August 2, 2021 at 10:00 - 12:00 and the materials taught were: 1) Genetic material, 2) Law of inheritance, 3) Inheritance of traits in humans, 4) Inherited traits in humans, 5) Application of inheritance in the breeding of living things, 6) Adaptation and natural selection. The material is contained in a package book that has been distributed to students. The teacher conveys the competency material to be achieved, then presents the material as usual. Furthermore, the teacher continues to carry out learning activities according to the stages in the articulation learning model as contained in the learning scenario.

The following week, the second face-to-face in cycle I, the final test of cycle I was held on August 9, 2021. The questions given were multiple choice questions. The results obtained can be seen in Table 1:

Table 1: End of Cycle I . Assessment Score

No.	Earning Aspect	Results
1	Total students	18 people
2	Number of students who completed	13 people
3	Classical completeness	81%
4	The highest score	90 (2 people)
5	Lowest value	50 (2 people)

After the end-of-cycle assessment was conducted, from 16 students there were 13 (81%) students who completed. The highest score of 90 was 2 people, the lowest score was 50 achieved by 2 students.

3.1.3 Observation

Observation activities were carried out by observers during the implementation of learning, namely on August 2, 2021. The focus of observation was observing teacher activities and observing student motivation during the implementation of learning.

Teacher Activities:

Observation of teacher activities aims to see the suitability of the implementation of learning with the lesson plan. In this first cycle, the teacher/researcher presented learning materials according to the plan, namely the application of the articulation model. All aspects of the assessment are generally good value, only there is a fairly good value, namely in terms of time management and student enthusiasm. More complete observation results can be seen in the appendix.

Student Activities:

Observations of student motivation are carried out by observers during the implementation of learning. The results of the observations can be seen in Table 2:

Table 2: Recapitulation of Observation Results of Student Learning Activities in Cycle I

Criteria	Total students	Percentage
Active	12	75.00
Active Enough	4	25.00
Less Active	0	0.00
Not active	0	0.00
Amount	16	100

In the first cycle of 16 students who are actively learning as many as 12 people (75%). While 4 people are quite active (25%), the complete results can be seen in the attachment.

In this first cycle, the teacher/researcher presented learning materials according to the plan, namely the application of the articulation model. Based on the observations, at first the students were a bit confused. This is because new students experience the articulation learning model. However, after being explained again, the students were so enthusiastic and enthusiastic, cooperated with each other, and began to show the expected learning outcomes.

3.1.4 Reflection

Based on the results of Cycle I, the results of observing student activities have not been achieved because only 12 people are active (75%). Likewise, the results of the final test of the first cycle of classical completeness were only 81%. For that, the researcher continued to Cycle II.

3.2 Cycle II

In this second cycle, the Basic Competencies presented are "Understanding the concept of static electricity and its symptoms in everyday life, including electricity in the nervous system and animals that contain electricity". As in the first cycle, in the second cycle, several activities were carried out at each stage.

3.2.1 Planning

A number of activities that have been carried out at this stage include making: lesson plans, learning scenarios, preparing literature books from the library, stationery for students (namely: lined HVS paper for notes), preparing learning outcomes assessment formats according to predetermined indicators, preparing observation format for teachers and students.

3.2.2 Implementation

The implementation of the actions in cycle II was carried out 1 time face-to-face in learning activities outside the end of the cycle test activities. In normal situations the number of lesson hours is 5 lesson hours (5 x 40 minutes) but in the implementation of PTMT the time allocation is 120 minutes, while the end of the cycle test is used for 40 minutes.

The first face-to-face in cycle II will be held on Monday, August 16, 2021 at 10.00 - 12.00 and the materials taught are: Static Electricity (Interaction between electric charges, Electric force, Electric potential, Electricity in the nervous system, Animals containing electricity).

The material is contained in a package book that has been distributed to students. The teacher conveys the competency material to be achieved, then presents the material

as usual. Furthermore, the teacher continues to carry out learning activities according to the stages in the articulation learning model as contained in the learning scenario.

The second face-to-face meeting in Cycle II will be held the following week, Monday, August 23, 2021. At this meeting, the final test of Cycle II will be assessed. The questions given are multiple choice questions. The results obtained can be seen in Table 3:

Table 3: Final Test Assessment Score Cycle II

No.	Earning Aspect	Results
1	Total students	16 people
2	Number of students who completed	15 people
3	Classical completeness	94%
4	The highest score	100 (3 people)
5	Lowest value	60 (1 person)

The test results in the second cycle of the 16 students who took the final test of the second cycle, completed 15 people with 94% classical completeness. The highest score of 100 was 3 people and the lowest score of 60 was 1 person.

3.2.3 Observation

Observations by observers were carried out during the implementation of the second cycle of learning, namely on Monday, August 16, 2021. The focus of observation by the observers was observing teacher activities and observing student activities during the learning process.

Observation of teacher activities aims to see the suitability of the implementation of learning with the lesson plan. All aspects of the assessment are of Good value. More complete observation results can be seen in the appendix.

The results of observing student activities can be seen in Table 4:

Table 4: Recapitulation of Observation Results of Student Learning Activities Cycle II

Criteria	Total students	Percentage
Active	15	93.75
Active Enough	1	6.25
Less Active	0	0.00
Not active	0	0.00
Amount	16	100.00

In cycle II, there were 16 students as many as 15 students who were declared complete in their learning activities. This means, in general, all students are active in learning. More detailed results can be seen in the appendix.

In this second cycle, the teacher/researcher presents the learning materials according to the plan by using the articulation model. And based on the observations of researchers that students are so active and enthusiastic in doing the tasks given.

3.2.4 Reflection

Based on the results of the final test of Cycle II where the classical completeness is 94%. This figure shows that the indicator for individual absorption of at least 70% and classical absorption of 85% has been achieved. Likewise, the results of observations of teaching and learning activities have also achieved indicators of success, namely the average teacher is "Good" and student activities in learning have also achieved

completeness, namely "Completed" 93.75%. For this reason, this research only reached cycle II.

Discussion

Based on the results of observations in cycle I, learning management in general went well, but there are still things that need to be improved, namely in time management and the need to increase student enthusiasm in participating in learning.(Ngalimun, 2013; Trianto, 2011). However, in the second cycle of learning management has increased where all aspects are of good value and this has a positive impact on student learning mastery. More details can be seen in the attachment.

Student learning activities also experienced an increase where in the first cycle, from 16 students there were still students who were only active enough as many as 4 people (25%). However, in the second cycle there was an increase where the completeness of student learning activities reached 93.75%, which means that all aspects of the activity can be achieved by all students. The comparison of the achievements of cycle I and cycle II can be seen in Table 5:

Table 5: Comparison of Student Learning Activity Achievements in Cycle I with Cycle II

Criteria	Total students		Percentage	
	Cycle I	Cycle II	Cycle I	Cycle II
Active	12	15	75.00	93.75
Active Enough	4	1	25.00	6.25
Amount	18	16	100.00	100.00

After observing the test scores/results in cycle I and cycle II, it turned out that there was a significant difference. The difference in the value in question is that from the number of students as many as 16 people, students who completed the first cycle as many as 13 people (81%) increased to 15 people (94%) in the second cycle. The highest score in the first cycle was 90 as many as 2 people in the second cycle the highest value increased to 100 as many as 3 people. The lowest score in the first cycle was 50 as many as 2 people and in the second cycle the lowest value was 60 as many as 1 person. For more details can be seen in Table 6.

Table 6: Comparison of Final Test Assessment Scores in Cycle I and Cycle II.

No.	Earning Aspect	Results	
		Cycle I	Cycle II
1	Total students	16 people	16 people
2	Number of students who completed	13 people	15 People
3	Classical completeness	81%	94%
4	The highest score	90 (2 people)	100 (3 people)
5	Lowest value	50 (2 people)	60 (1 person)

This study only reached the second cycle because the indicators of learning success/mastery, namely individual absorption of at least 70% and classical absorption of 85% had been achieved. The intended learning outcomes are results/values in the cognitive/knowledge domain. Likewise, the results of observations of teachers who teach in

this case the researcher in the process of teaching and learning activities on average are good, student activities are also completed 93.75%.

4. Conclusion

Based on the results of the classroom action research above, it can be concluded that: 1) The application of the articulation model can improve student learning activities in science learning in class 9.1 SMP Negeri 2 Sengkang in the 2021/2022 academic year; 2) The application of the articulation model can improve student learning outcomes in science learning for class 9.1 SMP Negeri 2 Sengkang in the 2021/2022 academic year; 3) The application of the articulation model can improve student activities and learning outcomes in science learning for class 9.1 SMP Negeri 2 Sengkang in the 2021/2022 academic year.

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