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Short Communication

Application of the Inquiry Method to Improve Learning Achievement in Digestive System Material

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Abstract. The cause of poor student learning outcomes is known through the teacher's inaccuracy in choosing learning methods and media. This media is what determines student activities in learning to achieve the expected goals. This study aims to improve student learning outcomes in addictive substance material for second class at Algemene Middelbare School (AMS) using power point media. The subjects of this study were 33 students of Second Class AMS. Learning improvement actions were carried out in 2 cycles. The expected benefits of this study are: For teachers, it is expected to broaden their horizons and improve teacher professionalism, for students of course to improve their learning achievements, and for institutions or schools it is expected to be useful as an innovation in teaching and learning. The results of this study are that the use of power point media for addictive substance material in second class at AMS has proven to be very influential on learning outcomes. This can be seen from the percentage of learning outcomes in cycle 1 to cycle 2 increasing. From the results of the evaluation, students who obtained scores above the minimum completion criteria in cycle 1 were 8 students with a percentage of 24.2% and in cycle 2 there were 28 students with a percentage of 84.8%.

Keywords: Student Activities, Learning Outcomes, Power Point.

1. INTRODUCTION

Teachers in the teaching and learning process must have their own competence in order to achieve the desired expectations in implementing education in general and the teaching and learning process in particular [1]. To have this competence, teachers need to develop themselves well, because the function of teachers is to develop and develop students' abilities professionally in the teaching and learning process [2]. Teachers must always think creatively in every learning activity. One of the factors that influences optimal student learning outcomes is a good learning climate, improving the learning system in an effort to improve the quality of education. Improving the quality of education can be created by implementing an appropriate learning system. The cause of poor student learning outcomes is due to teachers' inaccuracy in choosing learning methods and media. This media is what determines students' activities in learning to achieve the expected goals [3].

The world of education is inseparable from what is called learning and learning outcomes. According to Fontana, learning is a process of changing individual behavior that is relatively fixed as a result of experience, while learning is an effort to organize a nuanced environment so that learning programs grow and develop optimally. Learning is a process of individual behavior through interaction with the environment [4]. The learning process carried out by most educators today tends to achieve curriculum material targets, prioritizing memorization of concepts rather than understanding. This can be seen from learning activities in the classroom which are always dominated by teachers. In achieving material, teachers usually use the lecture method, where students only sit, take notes, and listen to what is conveyed and there is little opportunity for students to ask questions. Thus, the learning atmosphere becomes unconducive such as students are less interested, less motivated, and less active in the learning process so that students become

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passive. One of the learning media that can be used to overcome the above obstacles is the Microsoft Powerpoint program media. According to Hanifah [5] learning media is an intermediary to channel messages between the source (teacher) and the recipient of the message (students) in understanding learning materials during the learning process to be more effective and efficient which is packaged in an attractive form [6], [7]. Media Microsoft PowerPoint Program is a popular presentation application program and is currently the most widely used for various presentation purposes in the learning process [8].

In the core activities in the learning process using lecture and discussion methods, without using media only the second class Biology textbook is used as a learning resource. Teachers use more lecture methods in managing concepts so that students get abstract concepts in teaching and learning activities, and focus on the teacher. So that student involvement still seems less than optimal, this can be seen from the passivity of students in following and understanding the subject matter presented by the teacher. By seeing conditions like that, teachers are highly required to use media that are interesting for students and can also improve student learning outcomes. Based on the background above, the author conducted Classroom Action Research with the aim of improving student learning outcomes in the material on addictive substances through the use of PowerPoint learning media in the Second Class of Algemene Middelbare School.

2. METHOD

2.1 Subject, Time, and Place of Research

This research was conducted in the second class of Algemene Middelbare School (AMS) with a total of 33 students, consisting of 16 male students and 17 female students. The research spanned approximately two weeks, focusing on class-level activities related to Biology for the odd semester of the 2024 academic year. The material covered was "Addictive Substances," and the learning process included two cycles. The first cycle took place on October 26, 2024, followed by the second cycle on November 2, 2024.

2.2 Classroom Action Research Procedure Design

The implementation of learning improvement in Classroom Action Research (CAR) was carried out in two cycles with the same subject, each consisting of four stages: planning, implementation, data collection, and reflection. In Cycle 1, the planning phase involved preparing lesson plans on addictive substances, learning tools, and student worksheets. The implementation took place on Tuesday, October 26, 2024, with Supervisor 2 as the assessor. The session was conducted via video conference using Teams and included structured activities such as initial greetings, prayer, motivational engagement, and attendance checking. The teacher introduced the material with a question prompting students to consider why individuals might feel unwell if they abstain from smoking or drinking coffee. During the core activities, students worked in groups, discussed the material, presented their findings, and submitted written reports. The lesson concluded with the teacher guiding students in summarizing the material, assigning homework, and closing with a prayer. The media and resources used included Teams, science textbooks, and discussion and lecture methods. Data collection involved observations and tests to measure students' understanding and skills. Reflection on Cycle 1 revealed some strengths, such as improvements in teacher professionalism, but also weaknesses, including unengaging media and limited student activity due to a lack of clarity in learning objectives.

In Cycle 2, learning improvements were planned based on the analysis of Cycle 1. Preparations included appointing supervisors, creating improved learning scenarios, and enhancing instructional materials with PowerPoint and videos. The implementation on Tuesday, November 2, 2024, followed a similar structure, with additional multimedia resources such as YouTube videos to support learning. Students engaged more actively in group discussions and presentations. The data collection process mirrored Cycle 1, utilizing observation and tests to evaluate student progress. Reflection on Cycle 2 highlighted significant improvements in student participation and understanding. Students demonstrated better discussion skills and achieved the expected learning outcomes. Consequently, the learning objectives for the topic of addictive substances were successfully met, and the research concluded with Cycle 2.

2.3 Data Analysis Techniques

Data analysis in CAR is an activity of observing or examining, describing and linking each piece of information related to initial conditions, learning processes and learning outcomes to obtain conclusions about the success of learning improvement actions. The data analysis used is quantitative data analysis in the form of learning outcomes obtained by students. Quantitative data analysis can be done simply by using descriptive analysis. Descriptive analysis can be done by utilizing simple statistics such as calculating the average (mean) and calculating the percentage. according to Cole [9] explains that quantitative research as its name suggests, requires a lot of numbers, starting from data collection, interpretation of the data, and the appearance of the results. Calculating the average score can be done easily, namely by adding up all the data and then dividing it by the amount of data. According to Nguyen et al. [10], calculating learning outcomes using the formula:

$$Mean = \frac{\Sigma X}{N} \qquad (1)$$

The description of the variables in this study includes the following: The mean represents the average learning outcomes achieved by students. The symbol ΣX denotes the total value amount, which is the sum of all individual scores obtained by the students. The variable N represents the total number of students involved in the study. Meanwhile, according to Parong and Mayer [11], the formula for calculating the percentage of students who experience an increase in learning outcomes is:

$$P = \frac{n}{N} x100\% \qquad (2)$$

The description of variables in this study also includes percentages to evaluate success criteria. The variable PPP represents the percentage of students achieving specific outcomes, calculated by dividing nnn, the number of students who completed the criteria, by N, the total number of students. According to Hamilton et al. [12], the success criteria are categorized as follows: a percentage range of 80%–100% is classified as very good, 66%–79% as good, 56%–65% as enough, 40%–55% as not enough, and 0%–39% as very less. These classifications provide a clear benchmark for assessing the effectiveness of the learning process and outcomes.

3. RESULT AND DISCUSSION

3.1 Description of Learning Improvement Research Results

3.1.1 Cycle 1 Results Description

In the initial stage (implementation of action), the teacher as usual conditions students in a conducive learning by praying, taking attendance, and asking students to prepare stationery. Continued with apperception then explaining the learning material so that students' attention is more focused on learning activities, motivating students by holding questions and answers so that learning activities become alive, students are active and participate in learning activities, students work in groups on practice questions on student worksheets (LKS), teachers and students discuss the results of the work of the entire group, conclude the material together, conduct evaluations or individual exercises, as a follow-up the teacher gives a moral message to students as an understanding so that students study diligently at home. From the results of the evaluation of cycle 1 (observation), there are still many students whose scores have not reached the minimum criteria, while the targeted minimum criteria is 80. Of the 33 students, there are 25 students whose scores have not reached the minimum criteria, if presented, the number of students whose scores have reached the minimum criteria is 24.2%. The results of the evaluation results in learning cycle 1 are as follows:

Table 1 Table of Evaluation Value Obtained for Cycle 1

No	Code	Cycle Value 1
1.	10656	65
2.	10657	90
3.	10658	60
4.	10659	65
5.	10660	60
6.	10661	55
7.	10662	70
8.	10664	60
9.	10666	50
10.	10667	50
11.	10668	55
12.	10669	60
13.	10670	85
14.	10671	65
15.	10672	60
16.	10673	60
17.	10674	55
18.	10675	85
19.	10676	85
20.	10677	60
21.	10678	95
22.	10679	85
23.	10680	60
24.	10681	85
25.	10682	70
26.	10683	75
27.	10684	85
28.	10686	60
29.	10687	65
30.	10688	60
31.	10686	55
32.	10691	60
33.	10692	70
Average		67.3
Above criteria (Cut of 80)		8 students 24.2%
Below criteria (Cut of 80)		25 students 75.8%

3.1.2 Description of Cycle 2 Results

Learning improvement in cycle 2 (implementation of action), the teacher fixes the weaknesses and deficiencies in cycle 1, namely the teacher is more creative and improves the ability by using power point media. Observation in cycle 2 student activities seemed enthusiastic in implementing learning, students were also active, students made presentations through representatives of each group, many students were willing to ask questions and give suggestions on the work of other groups. And at the end of the learning activity, the teacher and students concluded the material that had just been studied.

After improving the learning activities in cycle 1 (success rate), the implementation in cycle 2 has created a better design so that there is progress and improvement in learning outcomes. This is proven by the comparison of evaluation values in cycle 1 and cycle 2. The evaluation value obtained in cycle 1 compared to the evaluation value obtained in cycle 2 can be seen in the following Table 2.

Table 2. Evaluation Value Obtained for Cycle 1 and Cycle 2

No.	Code	Cycle Value 1	Cycle Value 2
1.	10656	65	85
2.	10657	90	100
3.	10658	60	85
4.	10659	65	90
5.	10660	60	90
6.	10661	55	60
7.	10662	70	85
8.	10664	60	90
9.	10666	50	65
10.	10667	50	85
11.	10668	55	90
12.	10669	60	85
13.	10670	85	95
14.	10671	65	85
15.	10672	60	85
16.	10673	60	90
17.	10674	55	65
18.	10675	85	95
19.	10676	85	100
20.	10677	60	65
21.	10678	95	100
22.	10679	85	90
23.	10680	60	85
24.	10681	85	100
25.	10682	70	85
26.	10683	75	80
27.	10684	85	95
28.	10686	60	90
29.	10687	65	85
30.	10688	60	85
31.	10686	55	90
32.	10691	60	70
33.	10692	70	90
Average		67.3	85.9
Above Criteria (Cut of 80)		8 of 33 (24.2%)	28 of 33 (84.8%)
Below Criteria (Cut of 80)		25 of 33 (75.8%)	5 of 33 (15.2%)

From the results of cycle 1, there were 25 students who had not reached the minimum criteria from a total of 33 students, namely the percentage value of 75.8%. While students who had reached the minimum criteria were 8 students with a percentage of 24.2%. After taking corrective action in learning in cycle 2, there was an increase in the evaluation value of only 5 students who had not reached the minimum criteria with a percentage of 15.2%. While students who had reached the minimum criteria were 28 students with a percentage of 84.8%. So the percentage increase in the evaluation value from cycle 1 to cycle 2 was 60.6%. With these results, for more details, the percentage of evaluation value obtained in cycle 1 and cycle 2 can be seen in the following table:

Table 3 Percentage of Evaluation Scores Obtained in Cycle 1 and Cycle 2

No.	Value	Cycle 1		Cycle 2	
		Total students	%	Total Students	%
1.	100	-	-	4	12.1
2.	95	1	3.0	3	9.1
3.	90	1	3.0	9	27.3
4.	85	6	18.2	11	33.3
5.	80	-	-	1	3.0
6.	75	1	3.0	-	-
7.	70	3	9.1	1	3.0
8.	65	4	12.1	3	9.1
9.	60	11	33.3	1	3.0
10.	55	4	12.1	-	-
11.	50	2	6.1	-	-
Total		33	100	33	100

The graph of evaluation scores for cycle 1 and cycle 2 can be seen in the following graph:

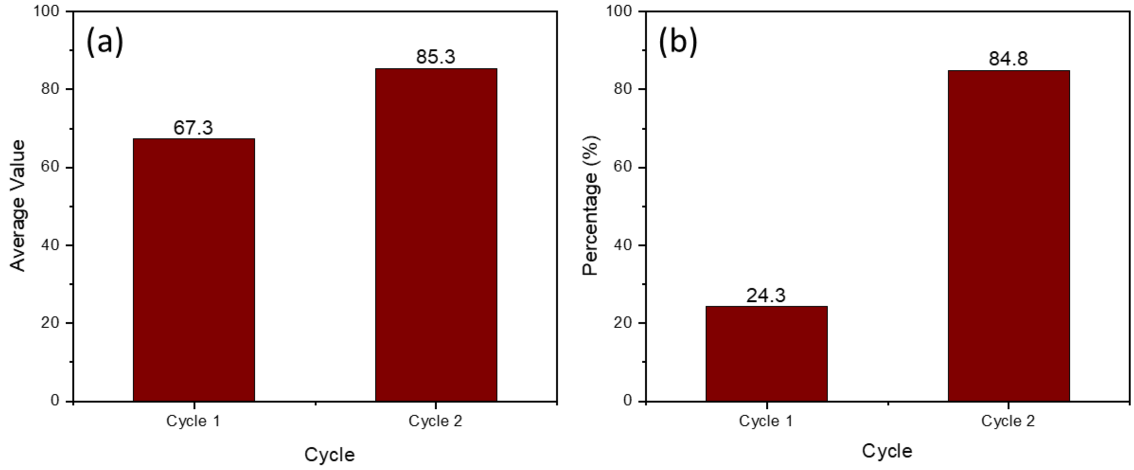

Figure 1. Graph of Evaluation Value Acquisition and Percentage Value (a) Before, and (b) After

3.2 Discussion of Classroom Action Research Results

The research that has been carried out is a classroom action research consisting of two cycles, where each cycle is carried out once via Teams video conference, according to the Biology subject schedule for Second Class of at AMS, namely on Tuesday. Cycle 1 was carried out on October 26, 2024 and cycle 2 on November 2, 2024. The low learning outcomes of students in science learning are caused by educators in delivering learning materials not using learning media optimally, and still using the dominant method, namely using the lecture method. In fact, the lecture method according to Haryani et al. [13] is not an effective teaching method. This is because the lecture method only relies on the use of words, so that students are drowned in a sea of words.

As a result, during the science learning process, students feel bored and do not understand the material explained by the teacher. Students tend to be silent and do not want to ask questions if they do not understand the material presented by the teacher and do not want to answer questions given by the teacher. This kind of learning process, if allowed to continue, will result in low student learning outcomes in science learning [14], [15]. For this reason, it is necessary to improve its objectives so that learning can be achieved optimally. The teaching and learning process by implementing the use of power points is a learning process that leads to learning strategies that activate students and make the vicon class conditions fun but learning is still active. Where the learning carried out by researchers is expected to bring the latest changes in learning towards a better direction.

Thus, learning by implementing the use of power point media can be used as an alternative to improve student learning outcomes because the learning carried out is accompanied by learning media that are interesting for students, so that student understanding can take place well and be obtained optimally [16]. Science learning using power point media can improve student learning outcomes. This can be proven by the results of the evaluation in cycle 1 to cycle 2 which have increased. Based on the evaluation value in cycle 1, there were 8 students who achieved the minimum criteria, then in the implementation of improvements in cycle 2, the results of the student evaluation increased to 20 students who achieved the minimum criteria. This shows that the use of power point media greatly influences the learning outcomes about addictive substances of Second Class students at Algemene AMS.

4. CONCLUSION

Based on the formulation of the problem and the results of the research that have been discussed, it can be concluded that the use of power point media for addictive substances material in Second Class at AMS has proven to be very influential on learning outcomes. This can be seen from the percentage of learning outcomes in cycle 1 to cycle 2, there was an increase. From the results of the evaluation of students who obtained scores above the minimum criteria cycle 1 were 8 students with a percentage of 24.2% and cycle 2 as many as 28 students with a percentage of 84.8%. Teachers should improve the quality of their teaching by trying to carry out other innovative learning.

5. AUTHOR DECLARATION

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Declaration of generative AI and AI-assisted technologies in the writing process - During the preparation of this work the author did not use AI for writing, editing, or anything else related to the manuscript.

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