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**EFFORTS TO INCREASE STUDENT ACTIVITY AND LEARNING  
OUTCOMES ON IDENTIFYING TYPES OF PESTS AND VEGETABLE  
THROUGH EXPERIMENTAL METHODS****Nani Nur'aeni**

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**Abstract**

This research is motivated by the low activity and learning outcomes of vegetable agribusiness to identify the types of pests and diseases of vegetable crops. This research is focused on the application of the experimental method. This type of research is Classroom Action Research (CAR) which adapts the Kemmis & Mc. Taggart with two cycles, which in each cycle two actions are performed. The subjects of this study were students of class XI ATPH 3 SMK Negeri 1 Losarang, totaling 36 students. Methods of data collection with the technique of observation, tests and documentation. Validation of data using triangulation technique. The data analysis used is a comparative descriptive analysis technique. The results of data analysis showed that the application of the experimental method was proven to be able to increase student activity and learning outcomes. An increase in learning activity from the initial conditions of 14 students or 38.89%, increased to 22 students or 61.11% in the first cycle, and 94.44% or 34 students in the second cycle, and an increase in student learning outcomes from the average in the second cycle. before the improvement was only 62.22, increased to 75.00 in the first cycle, and 85.86 in the second cycle, with a learning mastery level of 11 students (30.56%) in the initial conditions, 58.33% or 21 students in the first cycle. first, 31 students or 86.11% in the second cycle, and there are still 5 students (13.89%) who have not completed, so that all the criteria for completeness have been achieved in the second cycle. The conclusion is that the experimental method approach is proven to increase the activity and learning outcomes of students in class XI ATPH 3 SMK Negeri 1 Losarang Semester 1 of the 2020/2021 academic year in learning vegetable crop agribusiness on the subject of identifying the types of pests and diseases of vegetable crops.

**Keywords:** activity, learning outcomes, experiment

Received 10 September 2022, Revised 22 September 2021, Accepted 30 September 2022

**INTRODUCTION**

ATS productive subjects are taught at the Vocational High School (SMK) level to equip students with knowledge, understanding, and a number of skills to develop science and technology in ATS productive fields (Barrick et al., 2009). ATS productive subjects are the main subjects that must be mastered by students because they are the basis of further productive subjects. ATS productive lessons on the

subject of identifying the types of pests and diseases of vegetable crops require teachers to provide skills to students, one of these skills is skills in ATS productivity, especially on the subject of identifying the types of pests and diseases of vegetable crops. In the learning process students are required to be active and creative in learning by using learning media to support the productive success of ATS on the subject of identifying the types of pests and diseases of vegetable

crops. However, what happens is that learning in class XI ATPH 3 is related to the subject matter of the lesson above, showing some obstacles or problems as follows, students still find that they have not produced effective learning. At the time of learning there are still many students who are less attentive to the subject being presented. Even a few students who still have time to do other activities that have nothing to do with learning activities, for example disturbing friends who are serious about attending lessons, playing games, not helping friends because they do not know work, seeing friends who work like sitting pensively, many things are wrong. always there when the teacher gives group assignments (Djamarah & Zain, 2010).

In addition to the problems mentioned above, there are still many problems for other students found in the classroom, including: In general, students are not used to and lack the confidence to express their opinions, students are less active in learning, do not concentrate in the learning process, like to annoy friends, and likes to do activities outside of class (Sudjana, 2014). As a result, student learning achievement becomes low, with KKM scores below the average.

The problems above are very visible, then the problem is discussed with the homeroom teacher of class XI ATPH 3 and the school principal, after being formulated, the researcher concludes to conduct a collaborative Classroom Action Research (CAR) between the researcher and the homeroom teacher of XI ATPH 3 as an observer (Latif et al., 2017). Before this protest was held or the final test of the lesson, it turned out that the scores obtained by many students were below the minimum completeness criteria (KKM). In a quality learning process, 85% of students should score above the KKM, but in fact in class XI ATPH 3 ATPH 3 there are only 11 students or 30.56% of students scoring below the KKM (76). The low student learning outcomes in learning the subject of identifying the types of

pests and diseases of vegetable crops are shown by the fact that students are not active in participating in the learning process in class. If this is allowed to continue, of course many students will not be able to continue learning on the next subject. In the end, many students were remedial and caused insufficient time scheduled and finally students had to stay in class.

One of the efforts that can be done to overcome these problems is to apply the experimental method. The experimental method is a learning method that provides opportunities for students, either individually or in groups, to carry out a process or experiment by experiencing and proving for themselves something they have learned (Sagala, 2010). The experimental method is considered suitable for science learning because it is able to provide learning conditions that can develop thinking skills and creativity optimally. This is because in the experimental method students are given the opportunity to compose their own concepts in their cognitive structure, so that later they will be able to apply these concepts in life (Rohana, 2012).

This experimental method can make students believe in the truth or conclusions based on their own experiments rather than just accepting the words of the teacher or books. Teachers can develop active student involvement during the learning process, both physically, mentally, and emotionally in the experimental method. This involvement is expected to increase students' understanding of the material presented, so that student learning outcomes will also increase. The experimental method provides opportunities for students to practice their process skills while providing direct experience that can be embedded in their memory in order to obtain maximum learning outcomes (Kosasih, 2021).

This method is an effort for students to participate in the learning process at school, so that they can act actively to form their own knowledge by realizing ideas in their cognitive structure. The experimental method

is a method in which students try to practice a process, after seeing/observing what has been demonstrated by a demonstrator. Experiments can also be done to prove the truth of something, for example testing a hypothesis. Experiment is an effort or practice by using demonstrations aimed at students with the aim that all students are easier to understand and practice what they have obtained and can learn to experience a process and analyze the process.

The use of this technique has the aim that students are able to find and find various answers to the problems they face by conducting their own experiments. Also students can be trained in scientific thinking (scientific thinking). By experimenting students find evidence of the truth of the theory of something they are studying.

Based on the above background, in order to have a clear direction, the following objectives were set 1) to determine the increase in student learning activity on the subject of identifying the types of pests and diseases of vegetable crops through the experimental method in class XI ATPH 3 SMK N 1 Losarang Semester 1 Academic Year 2019/2020, and 2) to find out the increase in student learning outcomes on the subject of identifying the types of pests and diseases of vegetable crops through the experimental method in class XI ATPH 3 SMK N 1 Losarang Semester 1 of the 2019/2020 Academic Year.

## **METHOD**

The type of research used in this research is classroom action research. Classroom action research is an examination of learning activities in the form of an action, which is deliberately raised and occurs in a class together (Arikunto, 2013). In this study, researchers found problems in ATS productive learning material identifying the types of pests and diseases of vegetable crops in class XI ATPH 3 SMK N 1 Losarang Semester 1 for the 2019/2020 academic year, namely the lack of student activity and low student achievement in productive subjects. ATS

material identifies the types of pests and diseases of vegetable crops. The researcher intends to overcome the problem by improving the learning process through classroom action research by applying experimental methods in ATS productive learning to identify the types of pests and diseases of vegetable crops in class XI ATPH 3 SMK N 1 Losarang in the 2019/2020 academic year.

### **A. Type of research**

The type of research used in this research is classroom action research. Classroom action research is an examination of learning activities in the form of an action, which is deliberately raised and occurs in a class together (Arikunto, 2013). In this study, researchers found problems in ATS productive learning material identifying the types of pests and diseases of vegetable crops in class XI ATPH 3 SMK N 1 Losarang Semester 1 for the 2019/2020 academic year, namely the lack of student activity and low student achievement in productive subjects. ATS material identifies the types of pests and diseases of vegetable crops. The researcher intends to overcome the problem by improving the learning process through classroom action research by applying experimental methods in ATS productive learning to identify the types of pests and diseases of vegetable crops in class XI ATPH 3 SMK N 1 Losarang in the 2019/2020 academic year.

### **B. Data Collection**

#### **1. Data Collection Techniques**

The techniques used by researchers in this classroom action research are as follows.

- a) Observation, the observation technique is carried out on teachers and students during learning activities. This observation was carried out by research colleagues using the observation sheet as a

guide, and was carried out continuously in each cycle.

- b) Assessment or test, is an assessment technique that aims to determine the extent of the development and progress of the process of student learning outcomes and collect data and information in the context of efforts to improve learning activities. The data from the assessment can also be used to determine the effectiveness of the approach used.
- c) Documentation, documentation technique is an activity of recording evidence of all actions carried out during research activities. The documented activities include activities carried out by researchers and activities carried out by students as well as other activities that support the ongoing research such as interviews with students, and discussions with observers. All of these activities were recorded through a photo camera carried out by research colleagues.

### C. Data Analysis Techniques

The analysis in this study was carried out before entering the field, during the field and after finishing in the field. The data analysis that will be carried out qualitatively categorizes and clarifies based on the analysis, then it is interpreted in the context of the overall research problem. Data analysis was conducted to compare the level of student involvement and learning achievement before and after carrying out repairs. The quantitative data collected by the researcher is in the form of formative test scores, the technique used in analyzing the data is descriptive qualitative statistical analysis techniques, while qualitative data is used analytical techniques in the form of narrative exposure

1. Data from observations of student learning activities

Components observed or assessed from activity student learning using observation sheets with 4 indicators, namely the ability to present statements orally, in writing, pictures and diagrams, the ability to make assumptions, the ability to compile evidence, provide reasons/evidence for the correctness of the solution, and the ability to draw conclusions from statements.

**Table 1. Observation Results Assessment Criteria**

No	Score Range	Completeness Criteria
1	< 75	Uncomplete
2	≥ 75	Completed

2. Learning Outcomes Data

Student learning outcomes were analyzed quantitatively. According to [Arikunto \(2013\)](#) data analysis is intended to determine the mastery of student learning in teaching and learning activities. The value of each student through the learning outcomes test uses the following criteria:

**Table 2. Learning Outcome Assessment Criteria**

No	Score Range	Criteria
1	< 76	Uncomplete
2	≥ 76	Completed

The value of each student through a written test of learning outcomes is processed by the formula:

#### 1. Classical Learning Completeness

$$a = \frac{b}{c} \times 100\%$$

Note:

A = Completeness

B = Number of Completed Students (students scored above 76)

C = Total Number of Students

## 2. Average value

$$X = \frac{\sum Y}{n}$$

Note :

X = average score

$\sum Y$  = total score of all students

n = total number of students

## RESEARCH RESULTS AND DISCUSSION

### A. Cycle I

#### 1. Planning Result Data

After obtaining data on student learning outcomes of class XI ATPH 3 SMK N 1 Losarang in the initial conditions (pre-cycle), in the first cycle the researcher held a formal discussion with the observer to discuss the implementation time and the things needed in the research process and prepare readiness researchers to use experimental methods in the learning process. Furthermore, the researchers developed learning tools, which included a lesson plan (RPP) on the subject of identifying the types of pests and diseases of vegetable crops and student worksheets (LKS). In addition, the researchers also made student observation sheets to observe students' activity during the learning process and relate to customer satisfaction.

#### 2. Data on the Results of Action Implementation

At the end of the activity, a formative test at the end of cycle I was carried out. The teacher distributed questions that had been duplicated previously to each student. Each student must solve the problem individually. The teacher supervises the test, supervises that all students work on their own abilities. After the

allotted time is up, all students collect their work. Before ending the teacher delivered the material for the next meeting and asked students to study at home first and closed with greetings.

An explanation of the results of the action of the learning improvement process with the application of the experimental method showed an increase in each cycle. A clear and detailed description as described below:

**Table 3. Recapitulation of Formative Test Scores for ATS Productive Learning Subjects Identifying Types of Pests and Diseases of Vegetable Crops in Cycle I**

No	Completeness Criteria	Initial Condition	
		Total	%
1	Uncomplete	21	58,33
2	Completed	15	41,67
	Total	36	100,00
	Lowest Score		50,00
	Highest Score		90,00
	Average		75,00
	Completeness		58,33

From the table above regarding the recapitulation of the formative test scores for ATS productive learning, the subject of identifying the types of pests and diseases of vegetable crops above, it can be explained that in the first cycle the average grade of 75.00, and the number of students who have reached the mastery level of learning 21 students or 58.33% and unfinished as many as 15 students or 41.67%.

Seeing the results above, the researchers together with the observers concluded that the results of the learning outcomes test showed the results of 75.00, which means that they have not met the minimum KKM of 76, with the number of students who have completed their studies as many as 21 students or 58.33%. This shows that mastery learning has not reached the success criteria of 85% so that the process of improving

learning still has to be continued in the implementation of cycle II.

### 3. Data from Observation Results

An explanation of the aspects of learning and learning activities observed using 4 indicators, namely the ability to present statements orally, in writing, pictures and diagrams, the ability to make assumptions, the ability to compile evidence, provide reasons/evidence for the correctness of the solution, and the ability to draw conclusions from statements.

At the observation stage regarding student learning activities in ATS productive learning, the subject of identifying the types of pests and diseases of vegetable crops above can be explained as follows:

**Table 4. Recapitulation of Increasing Student Learning Activities in Cycle I**

No	Description	Total
1	Students Completed the progress	22
2	Percentage Completed	61,11
3	Students Uncomplete the progress	14
4	Percentage Uncomplete	38,89
5	Classic Complete	61,11

From the data in the table above, it can be seen that in the first cycle, students who showed an increase in student activity were 22 students or 61.11%, while the number of students who had not completed their studies was 14 students or 38.89%. Seeing the results above, the researchers together with the observers agreed to carry out learning improvements in cycle II with the hope that in cycle II students' learning activities could achieve gains above 85% in accordance with the predetermined success criteria.

### B. Cycle II

After considering the results of the reflection in the first cycle, then in the implementation of learning in the second cycle the researchers tried to perfect the

implementation of learning improvements. After improving learning by applying experimental methods through group formation and implementation of activities as well as intensifying question and answer activities and discussions, the expected results can be achieved maximally. This is as described in the explanation below:

#### 1. Planning Result Data

Based on the results of self-reflection and discussion with observers in the first cycle, the researcher prepared and determined a Learning Implementation Improvement Plan (RPPP) along with action scenarios covering the steps that teachers and students would implement in improving learning. In addition to lesson plans, researchers prepared various materials needed such as: props, worksheets, evaluation sheets and observation sheets. Furthermore, the researcher and the observer agreed on the focus and criteria to be used in the first two meetings of the cycle. Previously, researchers and observers conducted lesson plans simulations to anticipate failures in implementation.

#### 2. Data on the Results of the Actions

The formative test was carried out in cycle II. The teacher distributes the previously duplicated questions to each student. Each student must solve the problem individually. The teacher supervises the test, supervises that all students work on their own abilities. After the allotted time is up, all students collect their work. Before ending the teacher delivered the material for the next meeting and asked students to study at home first and closed with greetings.

An explanation of the results of the action of the learning improvement process by applying the experimental method showed an increase in each

cycle. A clear and detailed description as described below:

**Table 5. Recapitulation of Formative Test Values for ATS Productive Learning**  
The main topics of discussion are identifying the types of pests and diseases of vegetable crops in Cycle II

No	Completeness Criteria	Initial Condition	
		Total	%
1	Uncomplete	31	86,11
2	Completed	5	13,89
Total		36	100,00
Lowest Score		60,00	
Highest Score		100,00	
Average		85,56	
Completeness		86,11	

From the table above, it can be explained that in the second cycle the average value of learning outcomes increased to 85.56. The number of students who have reached the level of complete learning are 31 students or 86.11% and 5 students have not completed or 13.89%. Seeing the results above, the researcher together with the observer concluded that the learning outcomes showed an increase to 85.56. This shows that the learning outcomes have met the success criteria because classically the average value of learning outcomes is above the minimum criteria for completeness (KKM) of 76 and the number of complete students shows the number 31 students or 86.11% so that the learning improvement process is stated successful and complete in the implementation of the second cycle because it is already above the success criteria of 85%.

### 3. Data from Observation Results

An explanation of the aspects of learning and learning activities observed using 4 indicators, namely the ability to present statements orally, in writing, pictures and diagrams, the ability to make assumptions, the ability to compile evidence, provide reasons/evidence for

the correctness of the solution, and the ability to draw conclusions from statements. At the observation stage regarding student learning activities in ATS productive learning, the subject of identifying the types of pests and diseases of vegetable crops above can be explained as follows:

**Table 6. Recapitulation of Increasing Student Learning Activities in Cycle II**

No	Description	Total
1	Students Completed the progress	34
2	Percentage Completed	94,44
3	Students Uncomplete the progress	2
4	Percentage Uncomplete	5,56
5	Classic Complete	94,44

From the data in the table above, it can be obtained the following information in the second cycle, the students who showed an increase in learning activity were 34 students or 94.44%, while the students' explanations had not been completed as many as 2 students or 5.56%.

From the table above, it can be concluded that from 36 students there are 34 people who have completed their studies (94.44%) seen from their active learning. Seeing the results above, the researchers together with the observers concluded that the results of observations on increasing learning activity had reached above 85%, so that the learning improvement process was declared successful and complete in cycle II.

## C. Research Results

After analyzing the data obtained, the research results can be summarized as follows:

### 1. Learning outcomes

After analyzing the data obtained from the three cycles carried out, it can be concluded that the use of the experimental method in ATS productive

learning, the subject of identifying the types of pests and diseases of vegetable crops, showed a significant

improvement in the results of the learning process. In detail can be seen in the table below:

**Table 7. Recapitulation of Completeness and Student Learning Outcomes in ATS Productive Learning Subjects Identifying Types of Pests and Diseases of Vegetable Crops**

No	Learning	Students' Learning Outcomes				
		Average-2	Complete	%	Uncomplete	%
1.	Initial Condition	62,22	11	30,56	25	69,44
2.	Cycle I	75,00	21	58,33	15	41,67
3.	Cycle II	85,56	31	86,11	5	13,89

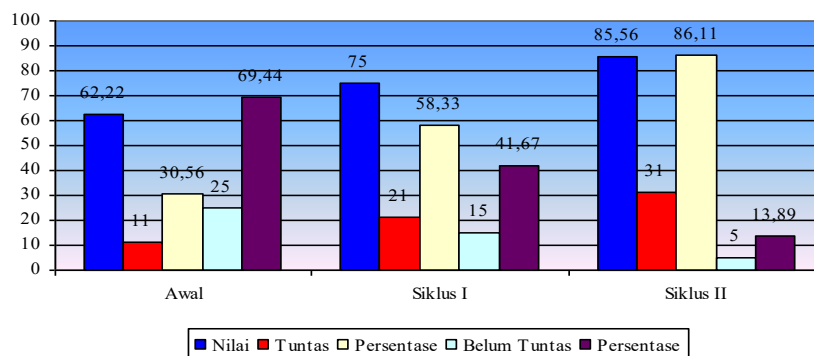
From the explanation in the table above, the following information is obtained:

- In the first cycle, the increase in learning completeness increased to 58.33% from the initial condition of 30.56%.
- In the second cycle, the increase in learning mastery increased to 86.11% from the first cycle of 58.33%.

- In the first cycle, the average value of learning outcomes increased to 75.00 from the initial study of 62.22.

- In cycle II, the average value of learning outcomes increased to 85.56.

For more details on improving student learning outcomes and mastery can be seen in the following bar chart:



**Figure 1. Bar Chart Comparison of the Average Scores of Student Achievement and Mastery in Each Cycle of Learning Improvement**

## 2. Learning Activity

From the results of the analysis of the increase in student learning activity in each cycle of learning improvement, in detail it can be seen in the table below:

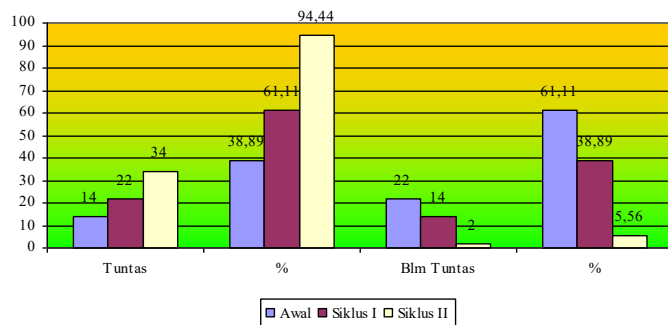
**Table 8 Recapitulation of Improving Student Learning Activities in ATS Productive Learning Subjects Identifying Types of Pests and Diseases of Vegetable Crops**

No	Cycle	Complete		Un	
		Total	%	Total	%
1	Initial Condition	14	38,89	22	61,11
2	Cycle I	22	61,11	14	38,89
3	Cycle II	34	94,44	2	5,56

From the explanation in the table above, the following information is obtained:



- a) In the Initial Condition, students who showed an increase in student activity were 14 people or 38.89%
  - b) In the first cycle, students who showed an increase in student activity were 22 people or 61.11%
  - c) In cycle II, students who showed an increase in student activity were 34 people or 94.44%
- For more details, the increase in learning activity can be seen in the following bar chart:



**Figure 2. Bar Diagram of Increasing Learning Activity in Each Cycle of Learning Improvement**

**D. Discussion**

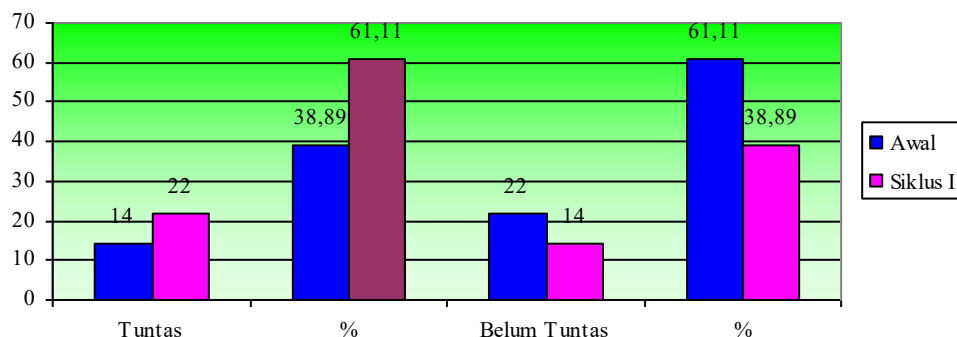
**1. Cycle I**

Based on the observation results of two meetings in the first cycle by the observer and the assessment of the results of the formative test of the first cycle, the results were still not complete as expected, in fact the results of learning mastery reached 21 students (58.33%) who were declared complete of 36 students who took part in the lesson. As for the explanation of the increase in student learning activity, 22 students (61.11%) increased their activeness in participating in the learning process from 36 students entirely, while the

average value of learning outcomes reached 75.00.

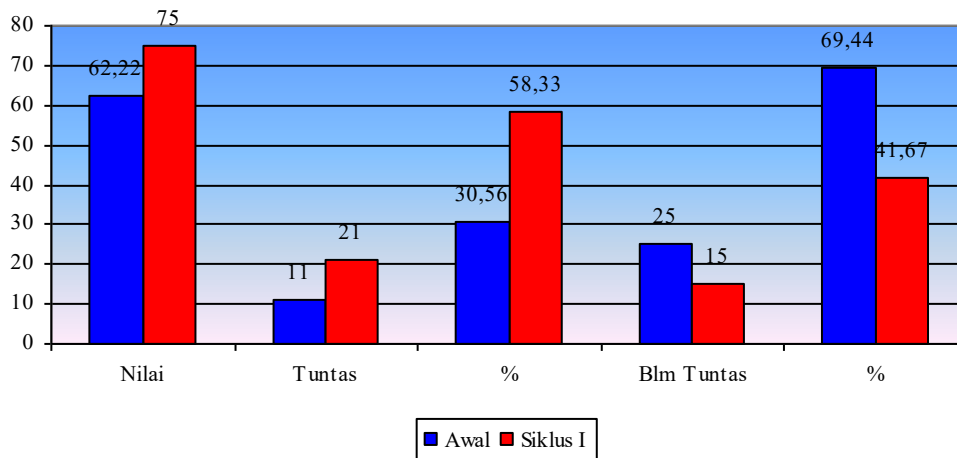
These results do not meet the desired learning completeness criteria. Therefore, after reflecting and discussing with the observers, the second cycle of learning improvements will be carried out again by intensifying the experimental method through group formation and implementation of practical activities as well as intensifying question and answer activities and discussions.

In the form of pictures, the increase in student learning activity in the initial study and cycle I as shown in the table below:



**Figure 3. Bar Diagram of Increased Learning Activity in the Initial Study and Cycle I**

While the increase in student learning outcomes in the initial study and cycle I in the form of pictures, as described in the picture below:



**Figure 4. Bar Diagram of Improving Learning Outcomes in the Preliminary Study and Cycle I**

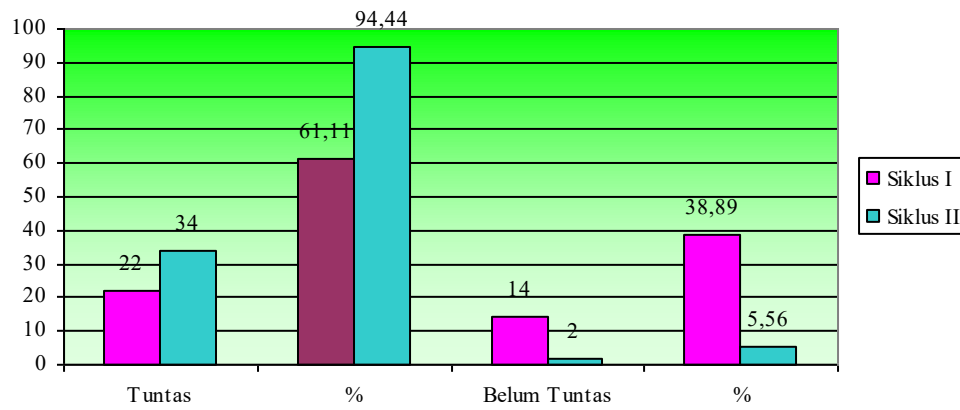
As an effort to improve in the second cycle, researchers are guided by the results of observations in the implementation of the first cycle, including:

- Students feel happy when the questions on the student worksheet (LKS) use the student's name, this is because students feel they are directly involved (a role) in the questions they are doing in the LKS.
- Students feel happy in teaching and learning activities if the learning uses concrete objects or manipulative objects, this is because the cognitive development of class XI ATPH 3 students is in concrete operations
- The learning process in groups will be more conducive if the number of group members is not too many, this is because when in groups the more the number of group members, the more opinions from group members.
- Carry out question and answer activities and discussions to discuss the results of project demonstration activities through the implementation

of group discussions guided by the teacher.

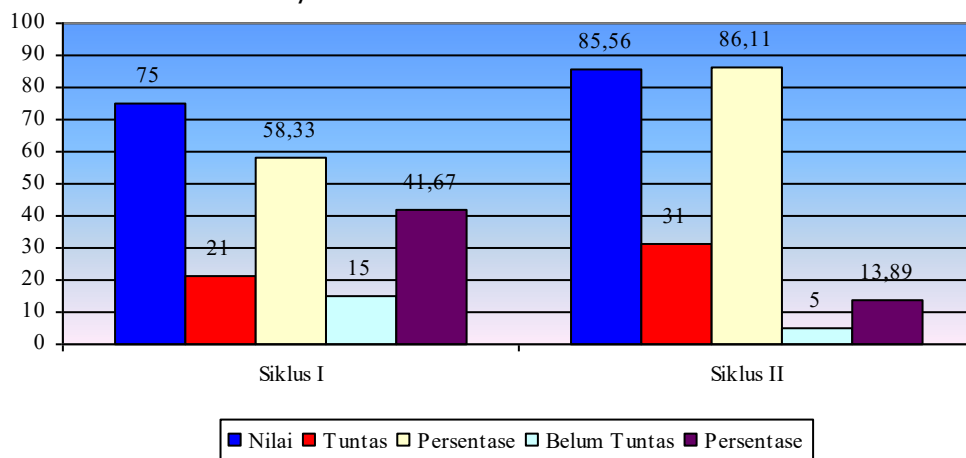
## 2. Cycle II

Based on the analysis of formative test data and observations in the second cycle, 31 students (86.11%) were declared to have completed learning from 36 students who took part in the learning process with an average score of 86.56. The explanation for the increase in learning activity at the end of the second cycle reached 94.44% or 34 students out of a total of 36 students so that the implementation of learning improvements was declared complete in the second cycle, and two students who had not finished studying would be given a remedial program to improve activity and results. studying the two students who have not finished. In the form of pictures, the increase in student learning activity in Cycle I and Cycle II can clearly be seen in the image below as shown in the table below:



**Figure 5. Bar Diagram of Increasing Learning Activity in Cycles I and II**

While the increase in student learning outcomes in the initial study and cycle I in the form of pictures, as below:



**Figure 6. Bar Diagram of Improving Learning Outcomes in Cycles I and II**

The success of the learning improvement process in the second cycle is proven by:

- a) Students are very good in participating in learning compared to cycle I.
- b) Students are very familiar with the use of real media in learning.
- c) Students are used to groups, so that student activity outside of learning activities is almost non-existent.
- d) Most students have a critical attitude in ATS productive learning by using the experimental method.
- e) Most of the students dared to ask and express their opinion.
- f) Most students want to answer the teacher's questions with answers that match the questions.
- g) Students are active in groups well, with good cooperation.

- h) The attitude of wanting to try students has been very well honed.
- i) Students have been able to find and conclude important things from the subject matter very well.

From the results of discussions with supervisors and observers, it can be concluded that the implementation of learning in two improvement cycles is declared successful and complete, and can be continued on the next material because it has met the specified completeness criteria.

This is indicated by an increase in student activity showing the acquisition in the initial conditions was only 14 students or 38.89%, increased to 22 students or 61.11% in the first cycle, and 94.44% or 34 students in the second cycle. This fact is also supported by an increase in

learning outcomes and completeness. This is evidenced by the increase in student learning outcomes from the average in the initial conditions of only 62.22, increasing to 75.00 in the first cycle, and 85.86 in the second cycle, with a learning completeness level of 11 students (30.56%). in the initial conditions, 58.33% or 21 students in the first cycle, 31 students or 86.11% in the second cycle, and there are still 5 students (13.89%) who have not completed, so all the criteria for completeness have been achieved in the second cycle.

From the acquisition of the figures above, it can be concluded that in the second cycle, the process of implementing learning improvements was declared complete, even though there were two students who had not completed their studies. After researchers with supervisors and observers discuss the results of observations associated with formative test results, then learning can be continued on the next material.

In carrying out research using experimental methods on students' learning activities on the subject of identifying the types of pests and diseases of vegetable crops, from the first cycle to the next cycle there was a change in the learning process towards the better. The results of observations on student activity in the learning process that have been carried out from the first cycle are still very lacking, while in the second cycle there is an increase. This increase is measured based on the value of the data obtained from each cycle.

Based on the explanation above, the application of the experimental method able to increase student learning activity towards learning success, because student learning activity is an important basic element to achieve success. In research using the experimental method In this study, researchers found students who were active in learning activities as

seen from the busyness of the students and the interaction between fellow students in participating in the ongoing learning. To achieve student learning activity towards student learning success that is expected above, of course the teacher's ability to manage learning is needed. Therefore, in this study the teacher's ability is also measured and able to manage learning activities well.

Based on the description above, the application of the experimental method can improve ATS productive learning outcomes in the cognitive domain of students. The application of the experimental method will be effective in increasing the activeness and productive learning outcomes of ATS if guidance is provided to students when carrying out experiments and presenting results. This is in accordance with the concept of learning according to Piaget, knowledge will be meaningful when it is sought and found by students themselves. That knowledge can be obtained when students take action or action against a stimulus, then students will gain physical knowledge. Finally, he is able to transfer his physical activity into ideas or ideas (Sanjaya, 2011). Learning according to Gagne states that learning carried out by experiments or experiments causes students to know about the concepts being studied gradually so that students find their own concepts of the material being studied and learning becomes more meaningful (Supriyadi, 2011). The achievement of meaningful learning, the learning outcomes of students can also increase (Andrini, 2016).

## CONCLUSION

Learning planning using the experimental method starts from formulating indicators that must be achieved after the experimental method ends, determining the experimental steps to be carried out, calculating the time required, and preparing the media to be used. The Learning

Implementation Plan (RPP) used in this study refers to the attachment of the Minister of National Education of the Republic of Indonesia Number 41 of 2007 concerning Process Standards for Elementary and Secondary Education Units. The lesson plan in this study has a peculiarity, namely in the learning steps that are adapted to the stages of the experimental method. In the preparation of this lesson plan, the researcher completed with student worksheets (LKS), evaluation questions, and student observation sheets that were adapted to the subject being discussed, namely identifying the types of pests and diseases of vegetable crops.

The application of the experimental method in learning the subject of identifying the types of pests and diseases of vegetable crops can increase student activity. This is evidenced by the increase in learning activity from the initial conditions of 14 students or 38.89%, rising to 22 students or 61.11% in the first cycle, and 94.44% or 34 students in the second cycle.

The application of experimental methods in learning the subject of identifying the types of pests and diseases of vegetable crops can improve student learning outcomes. This is evidenced by the average value of the class continues to increase from the initial study of 62.22, rose to 75.00 in the first cycle, and 85.86 in the second cycle, with a learning completeness level of 11 students (30.56% ) in the initial conditions, 58.33% or 21 students in the first cycle, 31 students or 86.11% in the second cycle, and there are still 5 students (13.89%) who have not completed, so all the criteria for completeness have been achieved in second cycle.

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