

## Use of Interactive Learning Media to Improve Student Learning Outcomes in Pneumatic Subject Matter Electronic Control System

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### Abstract

Learning Media is a learning tool used by someone using tools created to make it easier to deliver material when teaching at school. Based on observations made by the teacher, the findings were: (a) there were 12 students out of a total of 29 who had not yet reached the KKM; Students' interest in learning is lacking, students look less enthusiastic when the teacher explains the material presented. Based on the description above, the author wishes to examine this problem, through research with the title "Use of Interactive Learning Media to Improve Student Learning Outcomes in Pneumatic Materials in Electronic Control Systems Subjects in Class XII 1 TEI SMKN 1 Jetis". This type of research is classroom action research (PTK). The learning media used is Adobe Flash software. This research was conducted in three cycles, the subjects of this research were 29 class XII TEI 1 students. Data collection techniques are through observation sheets, questionnaires and formative tests. Analysis of the interest in learning questionnaire shows that the average student interest in learning has increased from 2.5 with the criterion of less interest to 3.2 with the criterion of interest while the average score obtained at Student learning outcomes increased in cycle I by 71.38, cycle II by 75.86 and cycle III by 83.10. Based on these results, it can be concluded that the use of interactive learning media has a positive impact in increasing students' interest in learning and can improve the learning outcomes of class XII TEI 1 SMK Negeri 1 Jetis students.

**Keywords:** Interactive Learning Media, Learning Outcomes, Pneumatics

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### INTRODUCTION

The learning process is a process in which there is interaction between teachers and students in a lesson to achieve learning goals. The learning process itself is diverse. This is because learning is essentially a complex (complicated) process, but with the same aim, namely providing learning experiences to students in accordance with the objectives. The goals to be achieved are actually a reference in organizing the learning process.

Learning Media is a learning tool used by someone using tools created to make it easier to deliver material when teaching at school. Learning using computer technology learning media like this must align the teacher to use the appropriate learning methods taught to students, so that students do not feel bored at school. (Arif 2012:26) says that the media is an intermediary or messenger of the sender's message to the recipient of the message.

Means that can be used to display or convey lessons are called learning media in a broad sense. In general, there are three types of media that need to be known, namely: audio media (can be heard), visual media (can be seen), and audio-visual media (heard and seen) (Sanaky, 2009: 21)

Adobe Flash CS 6 is a program that is used to create learning media and create animations, vector and bitmap animations which are very impressive for creating interactive and dynamic websites, besides this application can also be used to create animated logos, movies, interactive menus, interactive filling icons, e-cards, screen servers, and creating websites, or creating other web applications (Erwin Philipus, 2004)

A pneumatic system is a working system that uses compressed air as a control medium and working medium. According to the natural characteristics of air, pneumatic systems have advantages including unlimited media availability, cheap, clean, environmentally friendly, easy to store, easy to transport, have relatively high speeds, are not sensitive to changes in temperature, and are safe against overloads.

Pneumatics as a system is built on two main concepts, namely the system structure concept and the component mechanism concept. The system structure concept explains how the fluid cycle processes and

generates signals INVOTEC, Volume VIII, No.1, February 2012 : 46-57 to form a working system. The concept of component mechanism explains the properties of components in a system which include; working principle, actuation and return methods, number of possible contact positions, number of input-output channels and so on. Explanations of these concepts are represented in standardized verbal symbols (DIN ISO 1219 and DIN ISO 5599).

Difficulty explaining abstract, complex and dynamic concepts is a problem in learning pneumatic systems. Based on research results (Purnawan: 2006), theoretical models in the form of verbal symbols and available media/learning aids are not representative enough to be able to explain pneumatic system concepts realistically, so they may be inaccessible to students whose effects are less create a learning experience.

Based on the facts that occur in the field in the learning of Pneumatic Materials for class Low student interest can be seen from the lack of student activity when participating in the learning process, resulting in low learning outcomes. This is shown by the KKM (Minimum Completeness Criteria) of 70 not being achieved in the evaluation process given to students. Based on the background described above, the author wishes to examine this problem, through research with the title "Use of Interactive Learning Media to Improve Student Learning Outcomes in Pneumatic Material in Electronic Control Systems Subjects in Class XII TEI 1 SMKN 1 Jetis".

## METHOD

This research uses a Classroom Action Research (PTK) design. Classroom Action Research is an examination of learning activities in the form of actions that are deliberately created and occur in a class together (Arikunto, 2006: 3).

This research was carried out to solve problems in classroom learning. This research uses a participatory collaborative model, namely collaboration between researchers and teachers. So researchers are directly involved in planning action, implementation, observation and reflection.

This research was designed in two cycles, and the activities carried out in each cycle consisted of four things, namely planning, action, observation and reflection. The PTK steps used were adapted from the PTK flow according to Kemmis and Taggart which can be seen in Figure 1.

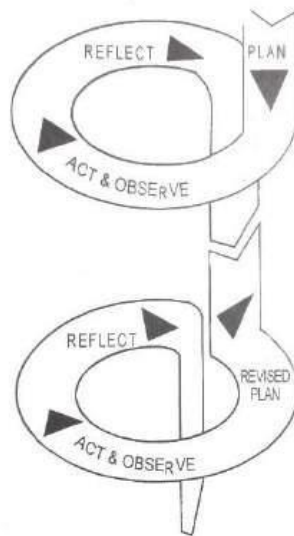


Figure 1 . Kemmis and Taggart Model Action Research Design

In this action research, the teacher as researcher is used, the person responsible for this research is the teacher. The main aim of this action research is to increase interest and learning outcomes in the classroom where teachers are fully involved in research starting from planning, action, observation, and reflection.

The subjects of this research were students of Class XII TEI 1 SMK Negeri 1 Jetis with a total of 29 students, consisting of 21 boys and 8 girls. Meanwhile, the object of learning is increasing students' interest in learning by using interactive learning media. The research was carried out in three cycles, namely cycle 1, cycle 2 and cycle 3. The cycle will end if the research results obtained are in accordance with the research success indicators.

The research instruments used in this research are as follows:

1. Test

The test carried out in this research was in the form of a multiple choice test which was given at the

end of the lesson to determine student learning outcomes regarding the material that had been presented.

## 2. Observation

The observations carried out were to see the implementation of the learning carried out by the observer.

## 3. Questionnaire

The instrument is an interest questionnaire which is given to students twice during the research, namely at the beginning of the research and at the end of the research.

## 4. Documentation

Documentation is used to obtain evidence of the implementation of the use of interactive media in Pneumatic Material for the Electronic Control Systems Subject in class XII TEI 1 at SMKN 1 Jetis. Documentation in the form of documents resulting from student work, documents resulting from interest questionnaires, lists of student grades, as well as documentation in the form of photographs of learning implementation and student activities during the learning process.

This research uses qualitative descriptive analysis techniques, namely a research method that describes reality or facts according to the data obtained with the aim of finding out the use of interactive learning media to increase student interest and learning outcomes in learning on pneumatic material in electronic control systems subjects in the classroom. XII 1 TEI SMKN 1 Jetis Mojokerto Academic Year 2023 - 2024.

Indicators of the success of using interactive learning media to increase interest in learning can be seen by comparing the average student interest in learning before and after using interactive learning media. The use of interactive learning media is said to be successful if the average value of students' learning interest before and after implementation increases.

## RESULTS

Before carrying out the research, the researcher first observed the condition of the students in class XII TEI 1 at the place where the researcher taught, namely SMK Negeri 1 Jetis. Based on these observations, the following findings were obtained: (a) there were 16 students out of a total of 29 who had not yet reached the KKM; (b) students' interest in learning is lacking, students look less enthusiastic when the teacher explains the material presented.

### Cycle I

Student learning outcomes in terms of the cognitive domain are in the form of test scores at the end of the first cycle of action with a total of 8 multiple choice questions. The recapitulation of cognitive learning results can be seen in Table 1.

Table 1 Recapitulation of Cycle I Learning Results			
Amount	Complete	Not Completed	The number of students
	21	8	29
Completion percentage	17.41%		
Average	71.38		

Students' interest in learning was measured using a learning questionnaire given at the beginning of cycle I which aims to measure students' initial interest before being given action. The recapitulation of students' learning interests can be seen in the table 2.

Table 2 Recapitulation of Student Learning Interests before Action

Amount	72.71
Average	2.5
Category	Less Interested

Reflection in cycle I was carried out after reviewing the results of observations and several obstacles that occurred during the implementation of the action which lasted for 1 meeting, namely :

1. Students are not yet optimal in carrying out learning because the learning time is short, namely 5x45 minutes
2. There are several student evaluation scores that have not yet reached the KKM so improvements need to be made

- Students tend to be passive in learning

### Cycle II

The planning stage of cycle II refers to the results of analysis and reflection in cycle I. Activities carried out at this planning stage are:

- Prepare lesson plans according to the Problem Based Learning learning method
- Prepare modules and LKPD
- Prepare an observation sheet for the implementation of activities
- Prepare learning outcomes evaluation tools in the form of multiple choice questions

The results of observations regarding the implementation of cycle II activities, overall the success of implementing activities was 87%. Student learning outcomes in terms of the cognitive domain are in the form of test scores at the end of cycle II with a total of 8 multiple choice questions. The recapitulation of cognitive learning outcomes can be seen in Table 3.

Table 3 Recapitulation of Cycle II Learning Results			
	Complete	Not finished	The number of students
Amount	24	5	29
Completion percentage	82.75%		
Average	75.86		

Reflection in cycle II was carried out after reviewing the results of observations and several obstacles that occurred during implementation, namely:

- Students are starting to adapt to the short learning time of 5x45 minutes
- In cycle II there were still several student evaluation scores that had not yet reached the KKM so improvements needed to be made in cycle III
- Students begin to appear active in learning, dare to ask questions and express opinions

### Cycle III

Action Planning Stage Activities carried out at this planning stage are:

- Prepare lesson plans according to the Problem Based Learning learning method
- Prepare modules and LKPD
- Develop a student interest questionnaire
- Prepare an observation sheet for the implementation of activities
- Prepare learning outcomes evaluation tools in the form of multiple choice questions

The results of observations regarding the implementation of cycle III activities, overall the success of implementing activities was 94%. Student learning outcomes in terms of the cognitive domain are in the form of test scores at the end of cycle III with a total of 8 multiple choice questions. A recapitulation of cognitive learning results can be seen in Table 4.

Table 4 Recapitulation of Cycle III Learning Results			
	Complete	Not finished	The number of students
Amount	29	0	29
Completion percentage	100%		
Average	83.1		

Students' learning interest was measured using a learning questionnaire given at the end of cycle III which aims to measure students' interest after being given action. The recapitulation of students' learning interests can be seen in Table 5.

Table 5 Recapitulation of Students' Learning Interest after Action

Amount	91.79
Average	3.2
Category	Interested

Reflection in cycle III was carried out after reviewing the results of observations and several obstacles that occurred during the implementation of the action which lasted for 1 meeting. The following are several things found in cycle III:

1. Students can adapt to the short learning time of 5x45 minutes
2. In cycle III, the evaluation scores of all students had reached the KKM
3. Students appear active in learning, dare to ask questions and express opinions

Research on the learning process using the Problem Based Learning learning model using interactive learning media shows good results. The successful implementation of learning activities can be seen in table 6.

Table 6. Comparison of implementation of activities in cycle I, cycle II and cycle III

	Cycle I	Cycle II	Cycle III
Amount	112	117	131
Implementation Percentage	80%	87%	94%

After carrying out learning using interactive learning media, data was obtained about student learning outcomes. Student learning outcomes are measured through formative tests in the form of multiple choices given at the end of each cycle. The learning results will be presented in Table 7 .

Table 7 Comparison of student learning outcomes between cycles I, II and III

	Cycle I	Cycle II	Cycle III
Total final score	2070	2200	2410
Average	71.38	75.86	83.10
Completion Percentage	72.41%	82.75%	100%

## Discussion

Based on data analysis, learning interest data was obtained before and after the use of interactive learning media. Comparison of learning interest before and after the use of interactive learning media can be seen in Figure 2

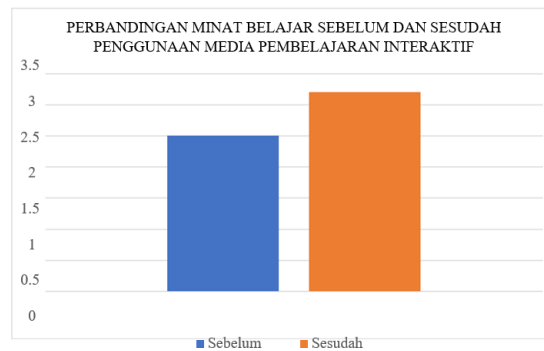


Figure 2 Comparison graph of learning interest before and after using interactive learning media

From the picture above there is an increase between before and after the use of interactive learning media. Before using interactive learning media, the average student interest in learning was 2.5. This average is classified as less interested.

Meanwhile, after implementation the average increased to 3.2. This value is included in the interested category. This happens because teachers always make learning improvements in the next cycle by utilizing interactive learning media which can increase students' interest in learning.

Thus, it can be concluded that before using interactive learning media, most students were less interested in basic electricity and electronics lessons, but after using interactive learning media, students began to be interested in these subjects. This is because interactive learning media can make students more active in lessons .

Learning outcomes are the abilities that students have after receiving their learning experience (Sudjana, 2004: 22). The results of this research show that the use of interactive learning media has a positive impact in improving student learning outcomes. This can be seen from the increase in the average student learning outcomes before the action of 67.59, increasing to 71.38 in cycle I, in cycle II it increased to 75.86 and in cycle III it increased to 83.10.

Before carrying out the classroom action research, there were 12 students whose scores were below the KKM, namely 70. In cycle I, learning outcomes increased as it was shown that there were 8 students who had not met the KKM, in cycle II there were 5 students who had not met the KKM and in cycle III all students had met the KKM. .

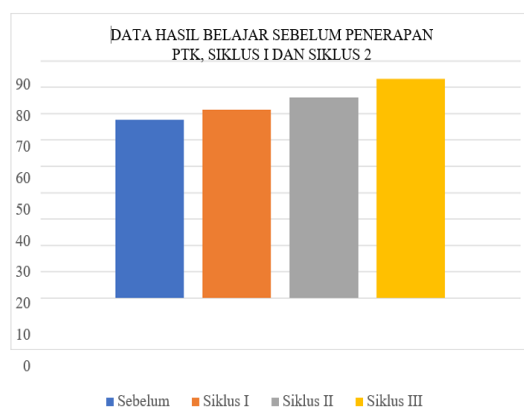


Figure 3 Graph of Improvement in Student Learning Results for Cycles I, II and III

By using interactive learning media, students become more enthusiastic in following lessons, this can be seen from the increase in learning outcomes and student interest in learning from cycle I to cycle III. Therefore, Interactive Learning Media is a media that is suitable to be applied in the classroom to increase student interest and learning outcomes.

## CONCLUSION

Based on the results of the research that has been carried out, it can be concluded that the use of interactive learning media has a positive impact in increasing students' interest in learning. This can be seen from the results of the average student interest in learning before the action, which was 2.5. However, after using interactive learning media, students' interest in learning increased to 3.2. The use of interactive learning media can also improve the learning outcomes of class XII TEI 1 SMK Negeri 1 Jetis students. This can be proven from the average student learning outcomes which have increased from cycle I to cycle III. The average in cycle I was 71.38, cycle II was 75.86, and cycle III was 83.10.

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