Implementation of ASICC-Based Student Worksheets To Improve High School Students' Critical Thinking Skills on the Topic of the Body's Immune System

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Abstract. Critical thinking is a thinking skill that involves complex cognitive processes. Based on the results of a preliminary study, it was revealed that learning at SMAN Negeri 1 Kediri is still carried out conventionally, causing students' critical thinking skills to be low. Critical thinking can be trained in a structured manner and through cultivation in the learning process. This research aims to reveal the impact of implementing ASICC-based worksheets on critical thinking. The research was carried out at SMA Negeri 1 Kediri using the development studies method, which consisted of a preliminary study and a prototyping stage. The data collection technique used was an essay test. The sample in the research was 32 students. Research reveals that ASICC-based worksheets can improve high school students' critical thinking skills. This is because students learn better through worksheets that contain cases and context.

Keywords: ASICC, student worksheets, critical thinking, biology

1 Introduction

Efforts to improve people's quality of life cannot be separated from the role of education as the basic foundation of state development. Through education, human qualities can be honed so that thinking skills and cognitive levels can develop. One of the goals of education in the 21st Century is to develop students' thinking skills, one of which is critical thinking skills.

Critical thinking skills are a person's ability to resolve and solve the problems they face [13]. Thinking skills are very necessary so that a person is able to think logically, overcome problems with rational decisions. Based on the results of observations and interviews with teachers at SMAN 1 Kediri. In the immune system material studied in class Many students find it difficult to understand the material. So students' critical thinking skills are less honed. This is proven by students not understanding the concept,

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the grammar is incomplete, they do not include reasons for each answer, and their line of thinking is not good.

Researchers chose immune system material because the concepts in the immune system material are abstract. Students are required to integrate the concepts of bacteria, viruses, the circulatory system and other organ systems so that the body is able to increase its immunity. As well as learning about diseases related to the immune system, for example the corona virus.

Problems in learning at SMAN 1 Kediri can be handled by using student worksheets. Student worksheets are conceptual, active, creative media, developing critical thinking skills in the learning process. To strengthen the LKS used for learning, it is necessary to use the ASICC model which can help implement the LKS well.

The ASICC learning model is based on ASICC consisting of the stages of adapting, searching, interpreting, creating, and communicating. Based on the learning model, student activities are directed at solving problems and honing critical thinking skills individually and in groups in more structured learning and the teacher only serves as a facilitator [9]

In addition, ASICC model LKS learning aims to guide students in self-reflection to achieve learning goals, gather key information, solve contextual problems, share ideas, and produce certain products. Based on the problems above. So the researcher aims to implement ASICC-based worksheets on the immune system material so that students are able to hone their critical thinking skills well.

2 Method

The research method used is development studies with two main stages, namely the preliminary study stage and the prototype stage. At the preliminary study stage, namely (preliminary stage) and the prototyping stage, a formative evaluation flow is used which consists of the self evaluation, expert review, one-to-one, small group and field test stages [10]. The subject of this research was class XI MIPA F SMA Negeri 1 Kediri with a total of 32 students. The data collection technique used was a written test.

The data analysis used is qualitative descriptive obtained from a written test with an assessment using a rubric [13] to determine students' critical thinking skills as shown in Table 1.

Table 1. Rubik for assessing critical thinking skills from Zubaidah et al (2015).

Score	Descriptor
Score 5	All concepts are correct, clear and specific All answer descriptions are correct, clear and specific, supported by strong, correct reasons, clear arguments Good flow of thinking, all concepts are interconnected and integrated Good and correct grammar All aspects are visible, the evidence is good and balanced
Score 4	Most of the concepts are correct, clear but lacking in specifics Most of the answer descriptions are correct, clear but not specific enough

Score	Descriptor
Score 3	Good flow of thinking, most concepts are interconnected and integrated Grammar is good and correct, there are small errors All aspects are visible, but not yet balanced A small number of concepts are correct and clear A small number of answer descriptions are correct and clear but the reasons and arguments are not clear
Score 2	The flow of thinking is quite good, some parts are not related to each other Grammar is good, there are spelling errors Most aspects appear correct Lack of focus or excessive or doubtful concepts Answer description does not support
Score 1	The flow of thinking is not good, concepts are not related to each other Good grammar, incomplete sentences A small number of aspects appear correct All concepts are incorrect or incomplete The reason is incorrect The flow of thinking is not correct Grammarly incorrect Overall aspects are insufficient
Score 0	There are no answers or wrong answers

After assessing using the Zubaidah rubric to determine the student's category in critical thinking skills, an analysis was carried out using the N-gain formula. The results of the analysis were categorized into 3 N-gain value criteria adapted from [4] which are shown in Table 2.

$$N-Gain=\frac{\text{Posttest Score } - \text{ Pretest Score}}{\text{Maximal Score } - \text{ Pretest Score}}\times 100 \quad (1)$$

Table 2. N-Gain Assessment Categories from Hake (2002).

N gain Score	Category
$g \geq 0.7$	High
$0.3 \leq g \leq 0.7$	Medium
$g < 0.3$	Low

3 Results and Discussion

There are two stages in developing an LKPD, namely the preliminary study stage and the prototyping stage. At the preliminary study stage, an analysis of the curriculum, students and student problems was carried out by interviewing biology subject teachers for class XI MIPA at SMA Negeri 1 Kediri. Based on the results of interviews with

teachers, it was found that the results for class XI MIPA refer to the 2013 curriculum learning.

The ASICC-based immune system student worksheet which can improve students' critical thinking skills according to the opinion of [10] is one of the learning tools that can be used to overcome this problem, namely by using the ASICC-based student worksheet (Adapting, Searching), Interpreting, Creating and Communicating). In learning activities using ASICC-based worksheets helps students to learn more structured. In this research, the ASICC syntax has stages to improve students' metacognitive skills. In the adapting stage, students implement the process of observing the video that has been provided, students ask critical questions. This can prove that students are able to improve critical thinking. At the searching stage, the editorial staff provides students to mark important things contained in the editorial and answer questions. In the interpreting stage, students form groups and are presented with hot questions that can improve students' critical thinking. In the creating stage, students are asked to create an output on the worksheet, namely making an educational video about the immune system. In the communicating stage, students present the results of discussions with the group. In this activity, there is reciprocity between groups who respond to each other's discussion results. This activity proves that ASICC-based worksheets can improve high school students' critical thinking skills.

From the results of calculations using the rubric of [12]and N-Gain analysis, the pre-test and post-test scores were obtained. The number of students with high scores was 18 students, medium was 12 students and low was 2 students.

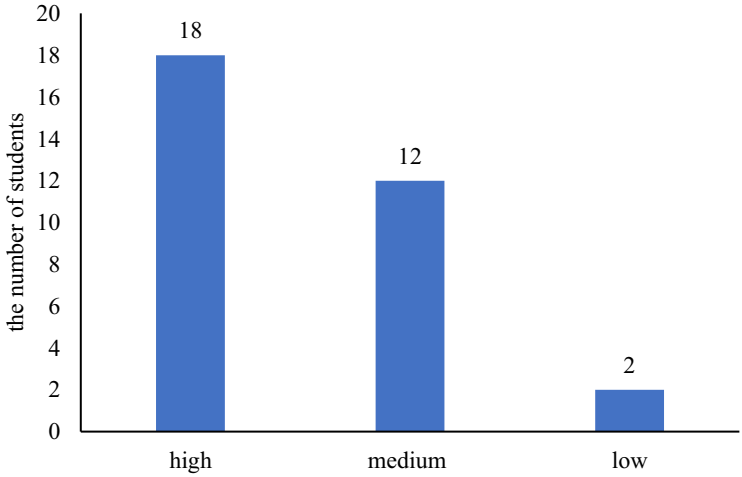

Figure 1. Results of N-Gain Analysis of Pre and Post-Test Values

Table 3. Scores obtained from pre-test and post-test

	Pre test	Post test
Grand Total Amount	446	703
Average	14	21,97
MIN Overall	8	19
MAX Overall	21	25

The total number of pre-tests was 446 and post-tests were 703, the average score obtained on the pre-test was 14 with a completion percentage of 56% and the post-test was 21.97 with a completion percentage of 88%. The minimum overall score on the pre-test was 8 and post-test 19, while the max overall score on the pre-test was 21 and post-test 25.

3.1 Discussion.

The ASICC-based student worksheet in research consists of the stages of adapting, searching, interpreting, creating and communicating [10]. The implementation of student worksheets at SMAN 1 Kediri is going well. This is proven by students being able to understand the concepts and material of the immune system.

According to [8], implementing the student-oriented ASICC learning model can improve students' critical thinking skills. The advantages of using the ASICC learning model are: The ASICC learning model guides students to be able to reflect on themselves to achieve learning goals, gather key information, solve contextual problems, share ideas, and produce certain products

Based on the implementation of worksheets using the ASICC model, it can stimulate students to improve critical thinking skills in learning with learning activities such as identifying problems, reflecting on themselves in learning, looking for keywords, exchanging ideas, and creating a product resulting from student learning. So that after students learn to use worksheets with the ASICC model, students can improve critical thinking skills in immune system material.

4 Conclusion

The conclusion of this research is that the application of ASICC-based student worksheets (LKS) can improve high school students' critical thinking abilities. This can be seen from the increase that occurred from the pre-test and post-test. The benchmark using Zubaidah's assessment rubric was obtained in the pre-test, reaching an average score of 14 with a completion percentage of 56%, which is classified as low criteria. Then there was an increase in the post test, obtaining an average of 21.97 with a completion percentage of 88% which is classified as high criteria. The number of students with high scores was 18 students, medium was 12 students and low was 2 students. Thus, it can be concluded that by implementing ASICC-based student worksheets to improve high school students' critical thinking skills on the topic of the

immune system, success has been achieved by looking at the percentage of student completion.

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