

The Differences of Physics Laboratory Work-Based Learning and Conventional-Based Learning to Improve the Science Process Skills and the Critical Thinking Skills at Grade X Students of SMAN 1 Seyegan

Rulli Aurilia Oktapina
10316244017

ABSTRACT

This research aims to determine the more effective learning through laboratory work-based learning and conventional-based learning to improve science process skills and critical thinking skills of the students. This research was done at grade X MIPA students of SMAN 1 Seyegan by the sub-topic linear motion (linear uniform motion and nonuniform linear motion).

The sample of this research was 58 students of X MIPA who were chosen by using cluster random sampling technique and divided them into two classes. The first class learned by using laboratory work-based learning and the second class learned by using conventional-based learning. The data were obtained through test, pre-test and post-test. Pre-test data were analysed to know the kind of statistic that could be used to examine the hypothesis. Post-test data were analysed by using t-test to examine the hypothesis to know the studying result differences (science process skills and critical thinking skills) between experiment class and control class. Furthermore, the more effective learning used learning study achievement and normalized gain effect size.

The result showed that there were differences of science process skills and critical thinking skills of the students by using laboratory work-based learning and conventional-based learning. It was shown that $t_{\text{arithmetic}}$ of two aspects were greater than t_{table} and $p < 0,05$. The learning study achievement and normalized gain score of experiment class was greater than control class for these aspects. The effect size's score of science process skills was 1,22 (high) and critical thinking skills was 0,64 (high enough). Therefore, it could be concluded that physics laboratory work-based learning is more effective than conventional-based learning to improve science process skills and critical thinking skills of the students.

Key words: Physics Learning, Laboratory Work, Science Process Skills and Critical Thinking Skills.

