

## ABSTRACT

The result of national examination in Senior High School students of Indonesia fluctuated for the last 3 years particularly in Yogyakarta. This examination is one of the national indicators for the achievement in the knowledge comprehension among the student on the certain subjects. Physics is a subject tested producing digression on the average score for the last 3 years; 2015-2017. Several factors that contribute are learning process method, environment, subject, teacher, and student's cognitive manner. However, latest factor has a high effect on accomplishing a success. The objective of this study is to investigate the mental fatigue of students in taking a part of teaching-learning process of Physics by analyzing the brain activity at cognitive system in 4 sessions. It is the combination of learning method (autodidact and non-autodidact) and condition (late morning and afternoon). An experimental study was conducted at laboratory to record beta, alpha and theta wave of brain that produced by electroencephalograph (EEG). Four students of Senior High School were participated in this study to attend a learning process of Physics for 90 minutes in each session. Non-parametric statistical analysis was performed to test the hypothesis. The result of this study showed that the autodidact learning method in the late morning for 54.25 minutes had a better performance in learning the Physic subject.

Keywords-electroencephalograph; mental fatigue; student; senior high school; Physics