

## ABSTRACT

**Patricia Ropindo Sinabutar, NIM 4182121014 (2018). The Development of E-Module Based on STEM in Temperature and Heat Materials.**

This development research aims to find out; (1) the level of validity of e-module based on STEM in temperature and heat material, (2) the level of practicality of e-module based on STEM in temperature and heat material, (3) the effectiveness level of e-module based on STEM in temperature and heat material. The subject in this research involved 35 students of class XI IPA 3 SMA Negeri 10 Medan. The type of research is Research and development (R & D) and applies the 4-D development model namely Define, Design, Develop and Disseminate steps. The data collection instruments used in this study consisted of a material expert and media expert validation questionnaire, a teacher response questionnaire, a student response questionnaire and a test instrument. The results of this study are; (1) the e-module get very valid criteria with an average score of material expert obtained percentage 96%, and media expert obtained a 99%, (2) the e-module get very practical criteria with the results of the average score for small group trials 91%, for large group trials 92% and for teacher response tests 98%. (3) the e-module get a moderate level of effectiveness with an average N-gain score of 0.69. So based on these results, it can be concluded that the e-modules based on STEM in temperature and heat materials are valid and effective to be used as learning material.

**Keywords:** *Development, E-module, STEM, Temperature and Heat*