

# DEVELOPMENT OF THE PROBLEM BASED LEARNING (PBL) MODULE ASSISTED BY PhET TO IMPROVE SCIENCE LITERACY IN TERMS OF THE INITIAL ABILITY AND CURIOSITY OF STUDENTS

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## ABSTRACT

This study aims to (1) produce a PhET-assisted PBL module that is suitable for learning Business & Energy material physics in class X SMA in terms of the initial ability and curiosity of students. (2) describes the increase in science literacy of class X high school students who use module learning media in learning physics material Business & Energy in class X SMA. (3). Revealing the relationship between learners' initial ability and curiosity and science literacy ability in the topic of effort and energy (4) describes the contribution of learners' initial ability and curiosity to science literacy ability both individually and together. This type of research is Research and Development (R&D), using a 4D model of Thiagarajan Semmel-Semmel (1974). The development research of the PBL module assisted by PhET physics starts from the define stage, namely information collection, initial planning including the study of the literature needed. Design stage with product development design of PBL modules assisted by PhET, by designing the development of syllabus, RPP, module design and supporting instruments. The develops stage of producing the product and performing, validating, revising, initial field trials, revisions, main field trials with experimental design. The instruments used consist of product assessment sheets, student response questionnaires, student curiosity questionnaires, and science literacy skills tests. The subjects of the study were students of class X MIPA 3, and X MIPA 5 at SMA Muhammadiyah 2 Yogyakarta. The data analysis techniques carried out are qualitative, descriptive analysis, on validator suggestions/comments, quantitative descriptive analysis with children with 2 variables as well as, standard gain analysis to determine the improvement of students' science literacy and ES test to describe its effectiveness. The results showed that the PhET-assisted PBL module on business & energy materials was declared "feasible" by validators. In the field test, the results of the implementation of the module in learning with children's testing were obtained learning by utilizing the module obtained the results of the experimental group better than the control group which utilized conventional learning gain value of 0.55 with a moderate category. The results of the effect size calculation obtained ES = 0.403 in the medium category, so that the use of the module is effective in increasing the science literacy of students. There was a significant association between initial ability and curiosity for science literacy with a regression coefficient  $R_{y(1,2)} = 0.795$  at a significance level of 5%. The contribution of initial ability and curiosity together with science literacy was 63.75% and alone the relative and effective contribution of initial ability and curiosity was successively limited to science literacy of 11.40% ; 88.57% and 7.39% ; 56.46%

Kata Kunci: *physics module, PhET, curiosity, science literacy*