

ABSTRACT

Andini Ardiva, 2019. “Development of E-Module Physics Based on Contextual Teaching and Learning to Improve the Science Process Skills of Class X High School Students in Work and Energy, Impulses and Momentum”. Thesis. Master Program in Physics Education, Faculty of Mathematics and Natural Sciences, Padang State University.

21st century learning needs require ICT-based learning with varied learning resources and are able to link learning with events that occur in everyday life. The fact is that these activities are difficult to do by teachers and students only on face-to-face hours, especially for students who carry out enrichment or students whose grades are above the KKM. One solution is to develop e-modules physics based on contextual teaching and learning to improve students' science process skills. The purpose of this study is to produce valid, practical and effective CTL-based physics e-modules used to improve science process skills of class X high school students on work and energy, impulses and momentum.

This type of research is Research and Development (R & D) using the ADDIE model. The stages of the ADDIE model are analysis, design, development, implementation and evaluation. The data collection instruments used included expert validation sheets, practicality test sheets, and effectiveness test sheets. The effectiveness test uses student science process skills assessment sheets. The data analysis technique used is N-gain analysis.

The results of curriculum analysis, analysis of concepts and material, analysis of students and analysis of facilities and infrastructure are supporting factors for the need to develop CTL based e-module physics, then the results of analysis of learning resources and analysis of science process skills that need to be improved. The results of the research at the design stage were produced by e-module physics designed with contextual teaching and learning. The results at the development stage with the results of validity according to learning experts and physicists respectively are 86.67 and 79.17 and the results of practicality according to teachers and students are 95.5 and 87.73. The results of the implementation phase of e-module physics meet the effective criteria which are marked by the gain score of students' science process skills of 0.8 which is categorized as high. The evaluation results are the results of an evaluation of the analysis, design, development and implementation stages. E-module physics based on contextual teaching and learning fill the criteria of valid, practical and effective. Therefore, this physics e-module is suitable for use in learning.

Keywords: E-Module Physics, Contextual Teaching and Learning, Science Process Skills

ABSTRAK

Andini Ardiva, 2019. “Pengembangan *E-Modul* Fisika Berbasis *Contextual Teaching and Learning* untuk Meningkatkan Keterampilan Proses Sains Siswa SMA Kelas X Pada Materi Usaha dan Energi, Impuls dan Momentum”. Tesis. Program Studi Magister Pendidikan Fisika, Fakultas Matematika dan Ilmu Pengetahuan Alam, Universitas Negeri Padang.

Kebutuhan belajar abad 21 menuntut pembelajaran berbasis *ICT* dengan sumber belajar yang bervariasi dan mampu mengaitkan pembelajaran dengan peristiwa yang terjadi dalam kehidupan sehari-hari. Faktanya menunjukkan kegiatan tersebut sukar dilakukan oleh guru dan siswa hanya pada jam tatap muka saja, khususnya bagi siswa yang melaksanakan pengayaan atau siswa yang nilainya berada di atas KKM. Salah satu solusinya adalah mengembangkan *e-modul* fisika berbasis *contextual teaching and learning* untuk meningkatkan keterampilan proses sains siswa. Tujuan penelitian ini adalah menghasilkan *e-modul* fisika berbasis *CTL* yang valid, praktis dan efektif digunakan untuk meningkatkan keterampilan proses sains siswa SMA kelas X pada materi usaha dan energi, impuls dan momentum.

Jenis penelitian ini adalah *Research and Development (R&D)* dengan menggunakan model ADDIE. Tahapan model ADDIE yaitu *analysis, design, development, implementation and evaluation*. Instrumen pengumpulan data yang digunakan mencakup lembar validasi tenaga ahli, lembar uji kepraktisan, dan lembar uji efektivitas. Uji efektivitas menggunakan lembar penilaian keterampilan proses sains siswa. Teknik analisis data yang digunakan adalah analisis N-gain.

Hasil analisis kurikulum, analisis konsep dan materi, analisis peserta didik dan analisis sarana dan prasarana merupakan faktor pendukung perlunya dilakukan pengembangan *e-modul* fisika berbasis *CTL*, kemudian hasil analisis sumber belajar dan analisis keterampilan proses sains yang perlu ditingkatkan. Hasil penelitian pada tahap desain dihasilkan *e-modul* fisika yang dirancang dengan berbasis *contextual teaching and learning*. Hasil pada tahap pengembangan dengan hasil validitas menurut ahli pembelajaran dan ahli fisika berturut-turut adalah 86,67 dan 79,17 dan hasil pratikalitas menurut guru dan siswa adalah 95,50 dan 87,73. Hasil tahap implementasi *e-modul* fisika memenuhi kriteria efektif yang ditandai dengan gain score keterampilan proses sains siswa sebesar 0,7 yang dikategorikan sedang. Tahap evaluasi memiliki dua tahap yakni evaluasi formatif dan evaluasi sumatif. Evaluasi formatif didapatkan dari hasil evaluasi tahap *analysis, design, development dan implementation*. Evaluasi sumatif dilakukan pada tahap akhir. *E-modul* fisika berbasis *contextual teaching and learning* memenuhi kriteria valid, praktis dan efektif. Oleh sebab itu *e-modul* fisika ini layak digunakan dalam pembelajaran.

Kata Kunci : *E-Modul* Fisika, *Contextual Teaching and Learning*, Keterampilan Proses Sains