

## ABSTRAK

PENGEMBANGAN *E-MODUL* INTERAKTIF BERBASIS *WEB*  
PADA MATERI METABOLISME KELAS XII

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2021

Pembelajaran daring (dalam jaringan) membuat peradaban baru pendidikan. Implementasi proses pembelajaran di beberapa SMA di Kabupaten Klaten dan Sukoharjo masih terdapat kendala dalam penerapan. Kendala fasilitas dan prasarana pembelajaran membuat siswa sulit menerima materi dengan baik. Salah satu upaya yang diharapkan guru yaitu dengan membuat siswa aktif dalam belajar mandiri dengan menggunakan *E-Modul Interaktif Berbasis Web* yang diterapkan di Kelas XII dalam materi Metabolisme dirasa susah dipahami oleh siswa. Penelitian ini bertujuan mengetahui pengembangan dan kelayakan *e-modul* interaktif berbasis *web* dalam materi Metabolisme Kelas XII.

Penelitian merupakan penelitian dan pengembangan (R&D) dengan model ADDIE (*Analysis, Design, Development, Implementation, and Evaluation*) yang hanya dilakukan sampai tahap *development*. Pada tahapan tersebut diawali dengan analisis kebutuhan di 6 SMA di Kabupaten Klaten dan Sukoharjo, dilanjutkan desain produk, pengembangan produk, dan uji kelayakan berupa uji validasi yang dilakukan oleh satu dosen ahli bidang materi, satu dosen ahli bidang media, dan dua guru biologi kelas XII sebagai ahli bidang materi dan media. Di akhir tahapan dilakukan revisi produk dari masukan validator.

Hasil penelitian menunjukkan, produk media pembelajaran *e-modul* interaktif berbasis *web* yang dikembangkan layak untuk diujicobakan kepada siswa. Berdasarkan hasil analisis validitas, dihasilkan persentase skor rata-rata validator materi yaitu 74,36% dengan kriteria “Tinggi” dan persentase skor rata-rata validator media yaitu 89,10% dengan kriteria “Sangat Tinggi”, sehingga diperoleh persentase rata-rata akhir yaitu 81,73% dengan kriteria validitas “Sangat Tinggi”. Hal tersebut menunjukkan bahwa *e-modul* interaktif berbasis *web* memiliki kualitas yang layak sebagai media pembelajaran setelah dilakukan uji kepraktisan.

**Kata kunci:** *E-modul* interaktif berbasis *web*, Media Pembelajaran, metabolisme, *Research & Development*

**ABSTRACT****DEVELOPMENT OF WEB-BASED INTERACTIVE E-MODULES  
TO TEACH METABOLISM MATERIALS FOR 12<sup>th</sup> GRADE STUDENTS**

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2021

*Online learning (in the network) creates a new civilization of education. The implementation of the learning process in several high schools in Klaten and Sukoharjo regencies still has problems in implementation. The constraints of learning facilities and infrastructure make it difficult for students to receive the material properly. One of the efforts expected by the teacher is to make students active in independent learning by using the Web-Based Interactive E-Module which is applied for 12th -grade students in the Metabolism material which is difficult for students to understand. This study aims to determine the development and feasibility of web-based interactive e-modules in the Metabolism material for 12th-grade students.*

*Research is research and development (R&D) with the ADDIE model (Analysis, Design, Development, Implementation, and Evaluation) which is only carried out until the development stage. At this stage, it begins with a needs analysis in 6 high schools in Klaten and Sukoharjo Regencies, followed by product design, product development, and feasibility tests in the form of validation tests conducted by one material expert lecturer, one media expert lecturer, and two biology teachers for 12th-grade students as an expert in the field of materials and media. At the end of the stage, a product revision is made from the validator's input.*

*The results showed that the web-based interactive e-module learning media product that was developed was feasible to be tested on students. Based on the results of the validity analysis, the percentage of the material validator average score is 74.36% with the "High" criteria, and the media validator average score percentage is 89.10% with the "Very High" criteria so that the final average percentage is obtained namely 81.73% with the validity criteria "Very High". This shows that the web-based interactive e-module has a decent quality as a learning medium after the practicality test has been carried out.*

**Keywords:** *Web-based interactive e-module, Learning Media, metabolism, Research & Development*