

ABSTRAK

IMAM WAHYUDI WINATA: Pengembangan Modul Praktikum Hukum Ohm Berorientasi HOTS (Higher Order Thinking Skills) untuk Meningkatkan Kemampuan Berpikir Kritis Siswa. **Program Studi Pendidikan Fisika FKIP Universitas Malikussaleh, 2026.**

Penelitian ini bertujuan untuk mengembangkan modul praktikum hukum Ohm berorientasi Higher Order Thinking Skills (HOTS) yang memenuhi kriteria valid, praktis, dan efektif dalam meningkatkan kemampuan berpikir kritis siswa kelas XI SMA. Pengembangan modul dilakukan sebagai upaya menyediakan bahan ajar praktikum yang mampu melatih kemampuan analisis, evaluasi, dan pemecahan masalah sesuai tuntutan pembelajaran abad ke-21.

Penelitian ini merupakan penelitian dan pengembangan (Research and Development) menggunakan model ADDIE yang meliputi tahap Analysis, Design, Development, Implementation, dan Evaluation. Penelitian dilaksanakan di SMA Negeri 1 Lhokseumawe dengan subjek terdiri atas validator ahli, guru fisika, dan siswa kelas XI. Data dikumpulkan melalui observasi, wawancara, angket, tes, dan dokumentasi menggunakan lembar validasi, angket, serta soal pretest dan posttest. Instrumen tes memenuhi kriteria valid dengan nilai r hitung $> r$ tabel (0,361) dan reliabel dengan koefisien reliabilitas 0,929. Analisis data menggunakan statistik deskriptif, uji Mann–Whitney U, dan uji Normalized Gain (N-Gain).

Hasil penelitian menunjukkan bahwa kelayakan modul yang dikembangkan memenuhi kriteria sangat valid dengan hasil validasi ahli media sebesar 83% dan ahli materi sebesar 78%, serta berdasarkan respons guru sebesar 98% dan respons siswa sebesar 83% dengan kriteria sangat tinggi, pada aspek kepraktisan didapatkan hasil sebesar 86,64% dengan kriteria sangat tinggi, serta efektif meningkatkan kemampuan berpikir kritis siswa. Hasil uji Mann–Whitney U menunjukkan nilai Asymp. Sig. (2-tailed) $< 0,001$, sedangkan nilai N-Gain kelas eksperimen (0,17) lebih tinggi dibandingkan kelas kontrol (0,0742). Dengan demikian, modul praktikum hukum Ohm berorientasi HOTS layak digunakan dalam pembelajaran fisika untuk meningkatkan kemampuan berpikir kritis siswa. Penelitian selanjutnya disarankan mengembangkan modul pada materi fisika lainnya dengan cakupan subjek yang lebih luas.

Kata Kunci: modul praktikum, Hukum Ohm, Higher Order Thinking Skills (HOTS), kemampuan berpikir kritis.

ABSTRACT

IMAM WAHYUDI WINATA: Development of an HOTS-Oriented Ohm's Law Practicum Module to Improve Students' Critical Thinking Skills. **Physics Education Study Program, Faculty of Teacher Training and Education, Universitas Malikussaleh, 2026.**

This study aimed to develop an Ohm's Law practicum module oriented toward Higher Order Thinking Skills (HOTS) that meets the criteria of validity, practicality, and effectiveness in improving the critical thinking skills of eleventh-grade high school students. The development of the module was intended to provide practicum teaching materials that train students' abilities in analysis, evaluation, and problem-solving in accordance with the demands of 21st-century learning.

This study employed a Research and Development (R&D) approach using the ADDIE model, consisting of the stages of Analysis, Design, Development, Implementation, and Evaluation. The research was conducted at SMA Negeri 1 Lhokseumawe, involving expert validators, a physics teacher, and eleventh-grade students as research subjects. Data were collected through observation, interviews, questionnaires, tests, and documentation using validation sheets, questionnaires, and pretest and posttest questions. The test instrument met the validity criteria with an $r_{\text{count}} > r_{\text{table}}$ (0.361) and was reliable with a reliability coefficient of 0.929. Data were analyzed using descriptive statistics, the Mann–Whitney U test, and the Normalized Gain (N-Gain) test.

The results showed that the developed module met the criteria of highly valid, with validation scores of 83% from the media expert and 78% from the material expert. The module also received highly favorable responses from the teacher (98%) and students (83%). In terms of practicality, the module obtained a score of 86.64%, categorized as very high, and was effective in improving students' critical thinking skills. The Mann–Whitney U test showed an Asymp. Sig. (2-tailed) value of < 0.001 , while the N-Gain score of the experimental class (0.17) was higher than that of the control class (0.0742). Therefore, the HOTS-oriented Ohm's Law practicum module is suitable for use in physics learning to improve students' critical thinking skills. Future research is recommended to develop similar modules for other physics topics with a broader range of research subjects.

Keywords: practicum module, Ohm's Law, Higher Order Thinking Skills (HOTS), critical thinking skill