

**Desain Lembar Kerja Peserta Didik (LKPD) Berbasis *Virtual Laboratory*  
Pada Materi Suhu Dan Kalor Melalui *Moodle* Kelas XI  
SMA Negeri 11 Medan T.A 2020/2021**

**ABSTRAK**

Penelitian ini bertujuan untuk mengembangkan bahan ajar berupa LKPD berbasis *virtual laboratory* pada materi pokok suhu dan kalor yang berkualitas layak. Jenis penelitian ini yaitu *Research and Development* (R&D) dengan menggunakan model 4D yang dibatasi menjadi tiga tahapan yaitu *define* (pendefinisian), *design* (perancangan), dan *develop* (pengembangan). Subjek dalam penelitian ini adalah siswa kelas XI SMA Negeri 11 Medan yang berjumlah 30 siswa. Hasil dari penelitian yang didapatkan berdasarkan validasi oleh ahli materi yaitu termasuk dalam kategori sangat layak dengan persentase rata-rata sebesar 82,7%. Berdasarkan penilaian ahli media yaitu termasuk dalam kategori sangat layak dengan persentase rata-rata 86,5%. Berdasarkan hasil uji kemenarikan oleh guru fisika termasuk dalam kategori sangat layak dengan persentase 91%. Produk LKPD yang dihasilkan memperoleh respon positif dari peserta didik, dilihat dari partisipasi selama proses pembelajaran dan juga didukung oleh data hasil penyebaran angket diperoleh pada uji coba kelompok kecil dengan sampel 8 siswa diperoleh persentase rata-rata sebesar 91% dan uji coba kelompok besar dengan sampel 30 siswa diperoleh persentase rata-rata sebesar 90%, masing-masing termasuk dalam kategori sangat baik. LKPD fisika berbasis *virtual laboratory* yang dikembangkan efektif untuk meningkatkan hasil belajar pada aspek kognitif peserta didik, ditunjukkan dengan perolehan N-gain sebesar 0,69 dikategorikan mengalami peningkatan sedang, sehingga berdasarkan hasil validasi, penilaian guru fisika dan respon peserta didik, dan nilai efektivitas dapat disimpulkan LKPD fisika berbasis *virtual laboratory* pada materi pokok suhu dan kalor layak digunakan dalam proses pembelajaran.

Kata Kunci: *Pengembangan, LKPD, Virtual Laboratory, Suhu dan Kalor, Moodle*



**Design of Student Worksheets (LKPD) Based on Virtual Laboratory  
On Material Temperature and Heat Through Moodle Class XI  
SMA Negeri 11 Medan T.A 2020/2021**

**ABSTRACT**

This study aims to develop teaching materials in the form of virtual laboratory-based worksheets on the subject matter of temperature and heat of decent quality. This type of research is Research and Development (R&D) using a 4D model which is limited to three stages, namely define, design, and develop. The subjects in this study were students of class XI SMA Negeri 11 Medan, totaling 30 students. The results of the research obtained are based on validation by material experts, which are included in the very feasible category with an average percentage of 82.7%. Based on the assessment of media experts, it is included in the very feasible category with an average percentage of 86.5%. Based on the results of the attractiveness test by the physics teacher, it is included in the very feasible category with a percentage of 91%. The resulting LKPD product received a positive response from students, seen from participation during the learning process and also supported by data from the results of the questionnaire distribution obtained in a small group trial with a sample of 8 students obtained an average percentage of 91% and a large group trial with a sample 30 students obtained an average percentage of 90%, each included in the very good category. The virtual laboratory-based physics worksheet that was developed was effective in improving learning outcomes in the cognitive aspects of students, indicated by the N-gain acquisition of 0.69 which was categorized as having a moderate increase, so that based on the results of the validation, the physics teacher's assessment and student responses, and the value of effectiveness can be calculated. concluded that physics LKPD based on virtual laboratory on the subject matter of temperature and heat is suitable for use in the learning process.

**Keywords:** *Development, LKPD, Virtual Laboratory, Temperature and Heat, Moodle*