ABSTRAK

Lestari (1202060043) : Desain E-LKPD Berbantu Simulasi *PhET* Menggunakan Pendekatan *Flipped laboratory* Untuk Meningkatkan Keterampilan Komunikasi Sains Materi Sistem Saraf

Keterampilan komunikasi merupakan salah satu keterampilan abad 21. Komunikasi spesifik pada pembelajaran Biologi, di antaranya komunikasi sains. Tujuan penelitian untuk mendeskripsikan karakteristik media pembelajaran, menganalisis peningkatan keterampilan komunikasi sains peserta didik dan menganalisis kendala E-LKPD berbentuk simulasi *PhET* menggunakan *Flipped Laboratory*. Metode penelitian dan pengembangan (*Research and Development*) menggunakan model 3D (*Define, Design,* dan *Development*). Hasil penelitian menunjukkan karakteristik E-LKPD berbantu simulasi *PhET* menggunakan pendekatan *Flipped Laboratory*, yaitu adanya simulasi, pembelajaran pra-kelas, dan penerapan teknologi dalam proses pembelajaran. Penggunaan E-LKPD mampu meningkatkan keterampilan komunikasi sains dengan n-gain rata-rata kelas eksperimen sebesar 0,56 kriteria sedang dan kelas kontrol hanya mencapai 0,19 kriteria rendah. Indikator mengubah sajian grafik memiliki skor *n-gain* rendah. Indikator mendiskusikan hasil kegiatan suatu masalah atau peristiwa memiliki skor *n-gain* tertinggi. Kendala dalam penggunaan E-LKPD diantaranya kesulitan mengakses E-LKPD saat pembelajaran pra-kelas dan kurangnya familiarisasi dengan media simulasi. Mengatasi kendala penggunaan E-LKPD berbentuk simulasi *PhET* menggunakan *Flipped laboratory* diantaranya memberikan pelatihan, panduan teknis, dan menerapkan pembelajaran bertahap.

Kata Kunci : E-LKPD, Komunikasi Sains, *Flipped Laboratory*, Simulasi *PhET*, Sistem Saraf.

ABSTRACT

Lestari (1202060043): *E-LKPD Design Assisted with PhET Simulation Using the Flipped laboratory Approach to Improve Science Communication Skills on Nervous System Material.*

Communication skills are one of the 21st century skills. Specific communication in Biology learning, including science communication. The research aims to describe the characteristics of learning media, analyze the improvement of students' science communication skills and analyze the constraints of E-LKPD in the form of PhET simulation using Flipped Laboratory. Research and development method using 3D model (Define, Design, and Development). The results showed the characteristics of E-LKPD assisted by PhET simulation using Flipped laboratory approach, namely simulation, pre-class learning, and application of technology in the learning process. The use of E-LKPD is able to improve science communication skills with an average n-gain of the experimental class of 0.56 medium criteria and the kontrol class only reaches 0.19 low criteria. The indikator of changing graphical presentation has the lowest n-gain score. The indikator discussing the results of the activity of a problem or event has the highest n-gain score. Obstacles in the use of E-LKPD include difficulties in accessing E-LKPD during pre-class learning and lack of familiarity with simulation media. Overcoming the obstacles of E-LKPD in the form of PhET simulation using a Flipped Laboratory. by providing training, technical guidance, and implementing phased learning.

Keywords: E-LKPD, *Flipped Laboratory, Science Communication, PhET Simulation, Nervous.*