Independent Lab Work Module Design of Geometric Optics about Convex Lens Using PhET Simulation (Physics Education and Technology) “Geometric Optics”

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ABSTRACT

In learning geometric optics, most of students were difficult to determine the position of real image, whether in front of the lens or behind the lens. The study of geometric optics about convex lens in a real laboratory can not present all of the parameters, such as lens curvature radius, refractive index of lens material, and lens diameter, so it needs virtual laboratory of simulation to support the learning process. This research investigated how to design the independent lab work module of convex lens using PhET simulation “Geometric Optics” and the effectiveness of the module in helping students to understand convex lens. All collected data from modules, observation sheets, questionnaires, and evaluation tasks were analyzed using the descriptive qualitative method. Respondents of this study were 10 freshmen of Physics and Physics Education of UKSW batch 2016. Based on the observations, all students did the lab work well. Questions led to the module were successfully answered well by students with a minimum score of 70%. Based on the evaluation, 70% of students managed to get a minimum score of 70%. The questionnaire results showed that students gave positive responses ≥80% towards the questionnaire. So, the independent lab work module of geometric optics about convex lens using PhET simulation “Geometric Optics” is effective in helping the students to understand convex lens.

Keywords: independent lab work module, PhET simulation, convex lens