

SYMPAB - (16250) - STUDENT RECOGNITION OF WAVE OPTICS PATTERNS EXPLORED BY EYE TRACKING

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Short Abstract

Recognition of typical interference and diffraction patterns is one of the expected learning outcomes of studying wave optics. Our aim was to investigate if high-school students can distinguish typical interference and diffraction patterns obtained by the double slit, single slit, and diffraction grating, and the distribution of their visual attention during the task. We also evaluated the effect of students' investigative experiments on their recognition of interference and diffraction patterns. Participants were 87 students in the last year of high school. They solved a series of multiple-choice questions which involved identification of typical interference and diffraction patterns while their eye movements were recorded. Low students' scores showed that the recognition of typical interference and diffraction patterns is a difficult task for high-school students. Nevertheless, students' investigative experiments had a positive effect on their performance. Analysis of eye-tracking data revealed which patterns were the most appealing to students and indicated the level of confidence in choosing a particular multiple-choice option. Our results suggest that students should be instructed to observe wave optics phenomena more systematically, and that students' investigative experiments can be helpful in the process