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Assessing student understanding of measurement and uncertainty

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The objectives of this study were to develop and assess student understanding of measurement and uncertainty. A test has been adapted and translated from the Laboratory Data Analysis Instrument (LDAI) test, consists 20 questions focused on three topics including measures of central tendency, experimental errors and uncertainties, and fitting regression lines. The test were evaluated its content validity by three physics experts in teaching physics laboratory. In the pilot study, Thai LDAI was administered to 93 freshmen enrolled in a fundamental physics laboratory course. The final draft of the test was administered to three groups—55 freshmen taking fundamental physics laboratory, 20 sophomores taking intermediated physics laboratory and 18 juniors taking advanced physics laboratory at Chiang Mai University. As results, we found that the freshmen had difficulties in all topics. Most sophomores and juniors had problems with experimental errors and uncertainties and fitting regression lines. These results will be used to improve teaching and learning physics laboratory for physics students in the department.

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