

SP - (16240) - USING EYE TRACKING FOR ITEM ANALYSIS AND RESPONSE PREDICTION IN THE CONTEXT OF KINEMATICS GRAPHS

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Short Abstract

The Test of Understanding Graphs in Kinematics (TUG-K) is the most widely used tests to assess learners' graph understanding in kinematics. The 26 multiple-choice items of the TUG-K pose various demands on the learners, for example, comparing two graphs qualitatively or evaluating the area underneath or slope of graphs. Whether learners meet these requirements is usually inferred from evaluating the results (scores) as correct or incorrect without looking at the solution process itself. However, the solution process contains information about thinking patterns, solution strategies, and task characteristics that withstands a purely product-oriented evaluation. Recent studies have shown that eye tracking can bridge this gap. The paper presents several analyses of an eye-tracking dataset (N=115 students) that provide rich insights into learners' interaction with TUG-K tasks. The results show that eye movements can reflect test demands on a procedural level, exceeding the capabilities of classical methods for test analysis. Eye tracking thus becomes an additional method of item analysis that contributes to the exploration of solution strategies, expertise, and test or item structures. The results further show that a prediction of response correctness based on eye-tracking data only succeeds if educational considerations about the conceptual task requirements are elaborated beforehand.