Parallel Performance Analysis between Free Response Environments and the Force Concept Inventory in Introductory Mechanics Courses NICOLE BOBBITT, AARON WADE, CHANDRA PRAYAGA, University of West Florida — This paper reports our attempts to: 1) find a way to model and predict common thought processes that cause typical misconceptions identified by the Force Concept Inventory (FCI), 2) create a problem solving situation that folds in both kinematics and force discussions, and 3) accurately assess the students' ability to interpret a kinematic graph. Two pen and paper test questions were designed with these goals in mind, both broken into specific elements, not only to allow for partial credit, but also to arrive at a quantifiable fragmentation of the necessary thought processes required to solve the problem. These results were compared to pre- and post-FCI data to analyze the common misconceptions as defined by FCI and their correlation to mistakes in the thought processes in answering the designed questions. Ultimately this, and any future questions, would become a tool in the classroom to pinpoint the critical ideas with which a typical student struggles during a mechanics course.

Nicole Bobbitt
University of West Florida