Field Observations of Engagement in Reasoning Mind

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Abstract.
This study presents Quantitative Field Observations (QFOs) of educationally relevant affect and behavior among students at three schools using Reasoning Mind, a game-based software system designed to teach elementary-level mathematics. High levels of engagement are observed. Possible causes for these high levels of engagement are considered, including the interactive pedagogical agent and other design elements.

Baker Rodrigo Observation Method Protocol (BROMP) for Quantitative Field Observations (QFOs).
• Students observed individually, in a pre-determined order using side glances and peripheral vision
• Affect (boredom, confusion, delight, engaged concentration, frustration, and other) is coded separately
• Trained observers (certified at Kappa = 0.6 for affect, Kappa = 0.8 for behavior) record the first affect/behavior they see, but have up to 20 seconds to make that determination
• Conducted using HART Android app, contact us for a copy

Reasoning Mind.
Reasoning Mind is a hybrid mathematics tutoring system that features a combination of teacher training and an interactive design where narrative and artistic elements are highly integrated. Students navigate throughout RM City (above), accumulating points which can be used to acquire books and other objects to decorate their own “room” (below, left). They are escorted through RM City by Genie, an interactive pedagogical agent who receives (and answers) thousands of student emails each month.

Results.
• Students in 2 classes at each of 3 Texas schools in the Gulf Coast region
• Two of the schools served large numbers of ethnic minorities and economically disadvantaged students
• The third was a suburban charter school with small classes and relatively few ethnic minorities or students from economically disadvantaged backgrounds.

Conclusions.
Reasoning Mind’s pedagogical techniques, combined with the highly integrated design elements of RM City appear to be highly engaging, and warrant further research into the effects they might have on learning outcomes and long-term STEM interests.

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References.

For further information on the BROMP method or other information about the methods/results of this study, please contact Jaclyn Ocumpaugh ocumpaugh@wpi.edu or Ryan S.J.d. Baker baker2@exchange.tc.columbia.edu.