Visualization of "States" in Online Educational Games

Jürgen Symanzik*
Utah State University, Department of Mathematics and Statistics, Logan, Utah, USA symanzik@math.usu.edu

Ani Aghababyan
Utah State University, Instructional Technology and Learning Sciences, Logan, Utah, USA, anie.aghababyan@gmail.com

Taylor Martin
Utah State University, Instructional Technology and Learning Sciences, Logan, Utah, USA, taylormartin@usu.edu

In the field of Instructional Technologies, online educational games play an important role. Children and students who play these games create a huge amount of online data as each mouse movement and mouse click is being recorded. The task of educators who are analyzing these data is to determine whether the participating children have made any progress in understanding the underlying topic. In this talk, we will focus on data from the "Refraction" game, accessible at http://games.cs.washington.edu/Refraction/. This game is an online puzzle that teaches fractions. Our presentation will focus on a graphical representation of the "states" reached by individual children in this game. For example, to create the fractions of 1/6 and 1/9, it is necessary to multiply 1/3 with 1/2 and 1/3. Nevertheless, many of the participating children try to multiply 1/2 with something else -- a starting move that never will lead to the correct solution. Our visualization of the intermediate "states" allows educators to assess which children have been on track and which children got lost with a particular mathematical fraction-based task.

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