CHILDREN'S UNDERSTANDING OF PLACE VALUE: THE DESIGN AND ANALYSIS OF A COMPUTER GAME

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This study used Stagecast Creator as a platform for the creation of an environment to investigate 6 year-old children's thinking about significant mathematical domain knowledge.

The aim of the game was to provide a meaningful context where the epistemological principles involved in children's understanding of place value were combined to discriminate their individual thinking processes. Place value is a convention defining that each digit has a different value according to its position in the number.

In the game, children had the opportunity to explore their own ideas about the differences between units of different sizes (i.e. hundreds, tens and ones) used in written multi-digit numbers, while ordering coins in caves guarded by "hungry" monsters. Each level enabled the dynamic interaction with different categories of multi-digit pairs, classified by conceptual relevance.

Children were able to keep track of their interactions during play by interpreting the feedback provided in the form of sounds, moves and animation. The feedback did not provide the correct answers, but promoted children's exploration and discovery

Case-study analysis suggests that this computational environment can open a window into children's thinking processes about mathematics by describing their individual trajectories of development from idiosyncratic ideas to more sophisticated conceptions about place value.

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