Content Integration as a Factor in Math-game Effectiveness

Experimental studies,Mathematics,Computer-assisted learning,Game-based learning

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In this study we focus on the integration of mathematical learning content (i.e. proportional reasoning) in a GBLE. More specific two kinds of GBLEs are set up; an extrinsically integrated GBLE and an intrinsically integrated GBLE. In the former environment, the mathematical content is not part of the core mechanics and structure of the gaming world. In the latter environment, the mathematical content is delivered through the parts of the game that are the most fun to play and embodied within the structure of the gaming world and the players interactions with it. Fifty-eight vocational track students participated in the study, all working in one of the two versions of the self-developed game-based learning environment ëZeldenrustí. The results of this study provide evidence for the effect of this different way of implementing learning content in an educational math game. More specific, students playing in an extrinsically integrated game show higher learning gains, motivational gains and perceived usefulness than students who played with a game in which the content was intrinsically integrated.

Game experience of the Number Navigation Game: Effects on arithmetic fluency and motivation

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The Number Navigation Game (NNG) is a mathematical Serious Game designed to enhance studentsí flexible and adaptive arithmetic strategies and to increase motivation towards math. Fourth to sixth grade classrooms were randomly sorted into either an experimental group (students n=642) which played the game during a ten-week period or into a control group (students n=526) which continued with a traditional mathematics curriculum. The aims of this study were to: 1) describe the effect of an intervention on studentsí arithmetic fluency and motivation expectancy-values; 2) describe studentsí game experiences with the NNG; and 3) describe the effect of studentsí differing game experiences on their arithmetic fluency and motivation expectancy-values. Results indicate that regardless of the intervention, all participants showed an increase in arithmetic fluency and a decrease in motivation expectancy-values, although the intervention had a small effect in accentuating these changes. Studentsí game experiences indicate the importance of further developing the NNG, particularly as these game experiences moderated the effectiveness of the intervention in increasing motivation towards