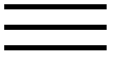


Digital game-based learning in high school computer science education: Impact on educational effectiveness and student motivation.

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Digital Game-Based Learning in high school Computer Science education: Impact on educational effectiveness and student motivation

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Abstract

The aim of this study was to assess the learning effectiveness and motivational appeal of a computer game for learning computer memory concepts, which was designed according to the curricular objectives and the subject matter of the Greek high school Computer Science (CS) curriculum, as compared to a similar application, encompassing identical learning objectives and content but lacking the gaming aspect. The study also investigated potential gender differences in the game's learning effectiveness and motivational appeal. The sample was 88 students, who were randomly assigned to two groups, one of which used the gaming application (Group A, $N = 47$) and the other

one the non-gaming one (Group B, $N = 41$). A Computer Memory Knowledge Test (CMKT) was used as the pretest and posttest. Students were also observed during the interventions. Furthermore, after the interventions, students' views on the application they had used were elicited through a feedback questionnaire. Data analyses showed that the gaming approach was both more effective in promoting students' knowledge of computer memory concepts and more motivational than the non-gaming approach. Despite boys' greater involvement with, liking of and experience in computer gaming, and their greater initial computer memory knowledge, the learning gains that boys and girls achieved through the use of the game did not differ significantly, and the game was found to be equally motivational for boys and girls. The results suggest that within high school CS, educational computer games can be exploited as effective and motivational learning environments, regardless of students' gender.



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Keywords

Interactive learning environments; Multimedia/hypermedia systems; Applications in subject areas; Secondary education; Gender studies

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Marina Papastergiou graduated in Computer Engineering and Informatics from the University of Patras (Greece) and received a Master's and a Ph.D. diploma in Informatics Education from the University of Paris VII (France) and the University of Thessaly (Greece), respectively. She is a lecturer at the University of Thessaly and her research interests focus on Informatics in Education.

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