On design of inclusive and enjoyable educational games- The Gaming4Coding concept

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Abstract: There is a long tradition of educational games and game-based learning started with the use of classic board games like Kalaha, Xiangxi, and Chess to train systematic and combinatoric thinking. Skills that are highly relevant today, for the development of 21st century skills involving computational thinking and computer programming. To introduce computer programming for secondary school children is a prioritised initiative in many countries today, and the idea is to achieve programming for all. At the same time as, educational games are a mainstream activity in many educational contexts today, research studies have reported that many games do not attract a female audience. The same lack of female interest can be found in studies on the gender unbalance in STEM education. This study has the aim of looking at design concepts for girl inclusive design in educational games on computer science. Several of these concepts have been applied to a game called Code Quest, a game where players collect cute fantasy creatures called 'critters' which can be trained by giving them instruction scripts. The critter training is by purpose, not called programming, in order to give the game less of a technical feeling and more the feeling of fantasy and fun. Code Quest has been evaluated. This study was carried out as a part of a larger Design science project, with a focus on demonstration and evaluation of the game artefact. Findings from the first iteration of testing show that the girl inclusive design ideas have worked relatively well. On the other hand, the traditional design issues have to handled as well and the game still has bugs to address. Finally, as in all game development there is a need for several test iterations before the game will be a useful complement to programming education in secondary school.

Keywords: Game-based learning, Inclusive design, Game design, Programming education, Computational thinking