Games for developing algorithmic thinking in Digital World textbooks for the first grade of primary education

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Abstract

Playing games with the aim of developing algorithmic thinking can create various teaching situations for active learning. Games enable learning through experience and discovery, they can be adapted to the pupils' needs, their prior knowledge, and interests. Digital games and devices can provide instant feedback and can contribute to the development of innovative teaching and learning methods. The introduction of the subject "Digital World" into the primary school education system of Serbia, as part of the new Prescribed Curriculum for the first grade, occurred three years ago. One of the key teaching domains of the subject is algorithmic thinking. New textbooks, in accordance with the Prescribed Curriculum, have been prepared and published by numerous authors and publishers. The aim of this paper is to detect the presence and analyze the quality of games for developing pupils' algorithmic thinking in seven accredited textbooks for the subject Digital World in the first grade of primary school. The paper first analyses the Prescribed Curriculum, specifically the outcomes, contents, and instructions for developing algorithmic thinking. The methodological analysis included the textbook program framework, concept, and functionality for developing algorithmic thinking through educational games with a special reference to the quality of digital games and digital devices such as educational robots. Through a systematic analysis, we conclude that the current Prescribed Curriculum does not contain detailed instructions for developing algorithmic thinking through educational games, and different textbook concepts for this teaching domain significantly differ.

Key words

developing algorithmic thinking, educational games, Prescribed Curriculum, pupil, textbooks