BLENDING COMPUTATIONAL AND MATHEMATICAL THINKING IN PRIMARY EDUCATION: THE SCRATCHMATHS PROJECT IN ENGLAND

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A 3-year design-based research project in England, ScratchMaths, has developed a set of curriculum materials for the last two years of primary school.These materials use the Scratch programming language to blend computational and mathematical thinking. In this workshop you will have the opportunity to explore some of the curriculum activities as a means to discuss the potential impacts of the underlying pedagogy and curriculum content on pupils' classroom experiences in other countries' contexts.

Keywords: mathematical thinking; computational thinking; Scratch programming language;

INTRODUCTION

Internationally, many countries are seeing a resurgence on the teaching of computer programming or 'coding' within formal and informal educational settings. In England, a revised national curriculum introduced coding within primary school education, which created a sudden need for both curriculum resources and teacher professional development opportunities. Pupils in Year 6 also sit a national examination in mathematics, which is 'high-stakes' in that it both contributes to all primary schools' nationally published accountability data and provides a baseline for pupils' mathematical outcomes as they enter secondary school. A 3-year project funded by the Education Endowment Fund has led to the development of a set of curriculum units that use the *Scratch* programming language (MIT Media Lab, 2013) and are aimed at the final two years of primary school education, Years 5 and 6 (9-10 years and 10-11 years respectively). These materials, which bridge ideas from the computing and mathematics curricula, have the underlying aim to improve pupils' mathematical outcomes. The project team has outlined the theoretical foundations for the ScratchMaths project and reported on aspects of its design and early implementations (Benton, Hoyles, Kalas, & Noss, 2016, 2017). Fundamental to our approach is the foregrounding of the Sc4atchMaths pedagogy, 'the 5 Es', Explore, Envisage, Explain, Exchange and BridgE: all will be explained in the workshop!

The workshop will be 'hands-on', which means that you will be expected to explore some activities from the ScratchMaths curriculum resources by interacting with the Scratch programming environment and the accompanying pupil andteacher materials. As we anticipate that many of the workshop's international participants will have examples of other similar projects, we will aim to address questions such as:

- What are the points of intersection between the primary school computing and mathematics curricula? How does this vary between countries?
- How can these points of intersection be developed?
- Can the language of programming, and the ideas and the approaches represented within it, offer a more open, more accessible and more learnable mathematics without sacrificing what makes mathematics work?

REFERENCES

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