(RE)ASSESSING MATHEMATICS EDUCATION IN THE DIGITAL AGE

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Digital technologies have been evident in the field of mathematics education since the late 1970s, a time of great optimism and enthusiasm for how emerging technologies would impact on school mathematics as a subject – and how mathematics would be taught and learned. Some fifty years on, whilst the pace of educational technology design accelerates, the parallel global transformation of school mathematics curricular – and associated high stakes assessment systems – lag noticeably behind. Within the mathematics education research field, there is general agreement about the barriers to systemic change: an underestimation of the professional needs of the teaching workforce; insufficient and inequitable access to suitable technologies; an unrealistic or ill-defined vision for students' digitally-enhanced mathematics learning experiences; challenges in the design and 'at-scale' uses of (mathematical) technologies in classrooms and its role within high-stakes assessments (Clark-Wilson, Robutti, & Thomas, 2020; Hoyles, 2018). The (re)emergence of computer programming, which was commonplace in UK mathematics classrooms of the 1980s has prompted some rethinking but, to date there are no widely accepted definitions of what a student's school mathematics educational experience in the digital age should comprise. The coronavirus pandemic prompted a global upskilling of students', parents' and teachers' digital skills within all phases of education and put technology, in its most general sense, on the map. In this invited lecture, I will offer a vision for how students' experiences of learning school mathematics *with and through* (mathematical) technologies might be reconceived. Alongside this, how the parallel assessment processes might be designed to enable a more student-centric approach that takes account of multiple sources of evidence. Most crucial to this is the role of teachers, whose expertise is more vital than ever as they support students to actively engage with substantive *dynamic* mathematical tools that make core mathematical ideas more tangible. The lecture will highlight how a deeper understanding of the theoretical construct of the 'hiccup' (Clark-Wilson, 2010; Clark-Wilson & Noss, 2015) might underpin wider understanding of the process of teachers' classroom-based learning concerning the adoption of mathematical technologies towards this vision.

References

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