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A theatre of mathematical history – a historical memoir

Extended summary

This paper begins with looking at the uses of the history of mathematics in mathematics education in England, in order to offer some insight into the possible ways of how history can benefit mathematics education at a national and local level. A case study, coming from the author's life-long work in mathematics education in this country examines a range of experiences related to the work with teachers represented by the two programmes for mathematics teachers which author designed and led for the Prince's Teaching Institute from 2009 to 2017.

The paper draws upon the current and existing scholarship on how to use the history of mathematics in a mathematics classroom. The author explores the relationship between history, philosophy of mathematics, and mathematics education. A number of uses of history of mathematics are explored, and several benefits to both teachers and students from studying the history of mathematics are presented and examined. The paper suggests possible ways for teachers to incorporate history in their teaching of mathematics.

Several international bodies supporting the efforts to investigate the uses of history of mathematics in mathematics classroom are also mentioned in this paper, such as working groups at the ICME (International Congress of Mathematics Education), as well as the global association of the mathematics history education scholars organised through the History and Pedagogy of Mathematics group (an associate organisation of the International Mathematics Union). Within such organisations, an established framework of research is conducted through

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different foci including the theoretical and conceptual one for integrating the history in mathematics education, as well as the epistemology in students' and teachers' mathematical education.

Further in this paper a new method for the use of history in the classroom begins to form from the chronological narrative of the author's experience. This method is based on her experience in the classroom with both secondary aged students and the mathematics teachers in training. It begins with exploring the ability of teachers to 'conjure' historical atmosphere and images of mathematicians in their context and the mathematics they worked on. The new method of course depends on how much we can conjure such examples in a mathematics classroom, and there are numerous examples where groups of people, or nations, or indeed movements which are mainly anonymous (such as, for example, the abacus schools in medieval Europe) contributed to mathematics, in which case the challenge would be to present such context in a small space and time that is limited by a mathematical classroom and within a time given to a mathematics lesson.

The author's research over a period of two decades is in this paper summarized and further enlightened by her work and engagement with (contemporary) mathematical bodies and societies. In this way, and through constant learning about the lives and activities of a wide range of mathematicians including those working in industry, government, education, and finance, and drawing the comparisons and parallels with the lives and contributions of historical mathematicians, the author suggests a way of metaphorically brining such experiences to the classroom. This, in effect, forms the new method of incorporating history in mathematics classroom, which is based on the ancient method of the art of memory, re-developed during the Renaissance. The method consists of creating an imaginary theatre of mathematical objects and images. To shed a little bit of light into the scenes on the mathematicians from the past and the work they did has been a perpetual interest of the author, and within the framework of the 'art of memory' the author's method is recommended as the one that can be replicated easily in any circumstances and by teachers in any mathematics classroom. Such 'theatre of mathematical history' has opened up the scenes in which mathematics and mathematicians play an eternal game of discovery that enchants as it engages all that see and experience it, including teachers and pupils of the discipline.

Keywords: National Curriculum in England, Prince's Teaching Institute, ICME (International Congress of Mathematics Education), History and Pedagogy of Mathematics group (HPM), European Summer School (ESU)

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