Mathematical problem-solving via Wallas’ four stages of creativity: implications for the undergraduate classroom.

Summary: The central theme in this article is that certain problem-solving frameworks (e.g., [G. Pólya, How to solve it. A new aspect of mathematical method. Princeton, NJ: Princeton University Press (1945; Zbl 0061.00616; ME 2015c.00402); M. P. Carlson and I. Bloom, Educ. Stud. Math. 58, No. 1, 45–75 (2005; ME 2005c.00902)]) can be viewed within Wallas’ four stages of mathematical creativity. The author attempts to justify the previous claim by breaking down each of Wallas’ four components (preparation, incubation, illumination, verification) using both mathematical creativity and problem-solving/proving literature. Since creativity seems to be important in mathematics at the undergraduate level, the author then outlines three observations about the lack of fostering mathematical creativity in the classroom. Finally, conclusions and future research are discussed, with emphasis on using technological advances such as Livescribe pens and neuroscience equipment to further reveal the mathematical creative process.

Classification: D55 C45 D35

Keywords: university teaching; problem solving; creativity; proving; fostering creativity; Wallas’ four-stage creative process; preparation; incubation; illumination; verification; mathematical creativity teaching observations

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