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Formative assessment of creativity in undergraduate mathematics: using a creativity-in-progress rubric (CPR) on proving.

Leikin, Roza (ed.) et al., Creativity and giftedness. Interdisciplinary perspectives from mathematics and beyond. Cham: Springer (ISBN 978-3-319-38838-0/hbk; 978-3-319-38840-3/ebook). Advances in Mathematics Education, 23-46 (2017).

Summary: Creativity is one of the most important aspects of mathematicians' work, whether it is an enlightenment that is somewhat unexpected or a product that is aesthetically pleasing. There are studies in the primary and secondary levels on mathematical creativity of students, and recent efforts have included mathematical creativity in K–12 education standards. However, there is little research in undergraduate mathematics education on creativity. The project described in this chapter introduces an assessment framework for mathematical creativity in undergraduate mathematics teaching and learning. One outcome of this project is a formative assessment tool, the Creativity-in-Progress Rubric (CPR) on proving, that can be implemented in an introductory proof course. Using multiple methodological tools on a case study, we demonstrate how implementing the CPR on proving can help researchers and educators to observe and assess a student's development of mathematical creativity in proving. We claim if mathematicians who regularly engage in proving value creativity, then there should be some explicit discussion of mathematical creativity in proving early in a young mathematician's career. In this chapter, we also outline suggestions on how to introduce mathematical creativity in the undergraduate classroom.

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