

Developing Financial Literacy and Mathematical Prowess by Modeling Using Spreadsheets

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Abstract:

AMATYC's *IMPACT* (2018) defines *mathematical PROWESS* as mathematical PRoficiency, OWnership, Engagement, and Student Success (p. 9). By combining spreadsheets, modeling, and personal finance, we show how to engage students in ways that develop their PROWESS and are useful for their everyday lives, their other college courses, and their future careers. We present a theoretical framework for mathematical modeling and argue that such modeling can be used simultaneously to promote students' financial literacy and to build their mathematical knowledge and quantitative skills. We apply our modeling framework in the classroom via a progression of financial investment situations: (a) equal periodic payments with no interest, (b) lump sum with compound interest, and (c) future value of an annuity. Students use spreadsheet software to organize the information of each situation into a systematic list and to represent the situation's mathematical structure. The software supports their modeling, reasoning, and problem solving. The situations are low floor -high ceiling; that is, they are accessible for all students, yet they provide cognitive challenges and opportunities to learn important mathematical content and develop critical thinking. Our aim is to show AMATYC's *IMPACT* in action.



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