ASSESSING STUDENTS' PROOF SKILLS: SUPPORTING PRESERVICE TEACHERS WITH SCAFFOLDING

Michael Nickl[1], Daniel Sommerhoff[2], Ricardo Böheim[1], Stefan Ufer[3], and Tina Seidel[1]

[1]Technical University of Munich (TUM), TUM School of Social Sciences and Technology, Munich, [2]Leibniz Institute for Science and Mathematics Education (IPN), Mathematics Education, Kiel, [3] Ludwig-Maximilians-Universität (LMU), Mathematics Education, Munich

INTRODUCTION

Introduction to proof is a key learning goal in secondary mathematics education. To optimally support students, their teachers need to be able to assess their proof skills adequately. However, this has been shown to be challenging for preservice teachers. To support the acquisition of assessment skills, simulations including cognitive (e.g., conceptual prompts, CP) and motivational scaffolding (e.g., utility value intervention, UVI) have proven effective in other domains. In this regard, research also pointed out that learners' success expectancy moderates their effectiveness. In the present study, we examine if these findings can be transferred to scaffolding of preservice teachers' assessment skills regarding students' proof skills.

METHOD

Assessment skills regarding proof skills of $N = 108$ preservice teachers were measured using a video-based simulation (Codreanu et al., 2020). A week after a pre-test, they were randomly assigned to a 2x2 intervention design with a UVI and CP condition.

Only the CP condition improved significantly from pre- to main test. Descriptively, CP and UVI conditions were on par in the main test. The UVI+CP condition increased least. We conclude that CP and a UVI effectively support preservice teachers' assessment skills regarding proof skills; for the effectiveness of their combination, more time for reflection might be needed. Regarding the role of success expectancy, students with one standard deviation above (below) the mean success expectancy benefitted most from a UVI (below: CP), which is in line with prior research.

References

Codreanu, E., Sommerhoff, D., Huber, S., Ufer, S., & Seidel, T. (2020). Between authenticity and cognitive demand: Finding a balance in designing a video-based simulation in the context of mathematics teacher education. *Teaching and Teacher Education, 95*, 103146. https://doi.org/10.1016/j.tate.2020.103146