ADAPTIVE TASKS—TEACHERS' DIFFERENTIATING VIEW ON SURFACE AND DEEP STRUCTURES

Thomas Bardy, Lars Holzäpfel, Frank Reinhold, and Timo Leuders

University of Education Freiburg, University of Applied Sciences and Arts Northwestern Switzerland

INTRODUCTION

Tasks play a central role in math lessons. However, not all tasks in mathematics textbooks are suitable for differentiated teaching because of their low "differentiation potential", i.e., the implementation of specific adaptive task features in the deep structure of a task. We call a task with a high differentiation potential "adaptive task". Our aim is to examine differences in teachers' reasoning with task features when considering the differentiation potential of tasks.

TEACHERS' FOCUSSED TASK FEATURES

In a study with $N = 78$ secondary mathematics teachers, we asked whether teachers were able to assess the differentiation potential of tasks—and we found that several different task features guide teachers in their reasoning (Bardy et al., 2021). Among these 23 features are those that focus on relevant features in the deep structure of tasks in terms of the differentiation potential, e.g., "openness", "accessibility", "goal differentiation", and "difficulty" (e.g., Sullivan, 1999), but also those that focus on features at the surface structure, e.g., "layout" or "presentation" (e.g., Hammer, 2016).

Given these broad variety of different task features, we aimed at extracting "prototype" of teachers that describe specific groups of teachers with similar focus when assessing the differential potential of tasks. A hierarchical cluster analysis revealed three types of teachers: with a broad focus on the surface and the deep structure of tasks (*41%*), with a focus on the deep structure of tasks in terms of the task content (*40%*), with a focus on the deep structure of tasks in terms of the differentiation potential (*19%*).

References

Bardy, T., Holzäpfel, L., & Leuders, T. (2021). Adaptive tasks as a differentiation strategy in the mathematics classroom–features from research and teachers' views. *Mathematics Teacher Education and Development, 23*(3), 25-53.

Hammer, S. (2016). *Professionelle Kompetenz von Mathematiklehrkräften im Umgang mit Aufgaben in der Unterrichtsplanung: theoretische Grundlegung und empirische Untersuchung.* Ludwig–Maximilians–Universität München.

Sullivan, P. (1999). Seeking a rationale for particular classroom tasks and activities. In J. M. Truran, & K. N. Truran (Eds.), *Proceedings of the 21st annual conference of the Mathematics Educational Research Group of Australasia* (pp. 15-29). MERGA.

2022. In C. Fernández, S. Llinares, A. Gutiérrez, & N. Planas (Eds.), *Proceedings of the 45th Conference of the International Group for the Psychology of Mathematics Education* (Vol. 4, p. 175). PME.