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2nd International Conference on Math Education and Technology (ICMET 2024) Book of Abstracts

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Computational Thinking in the Classroom - Practices of Elementary Mathematics Teachers

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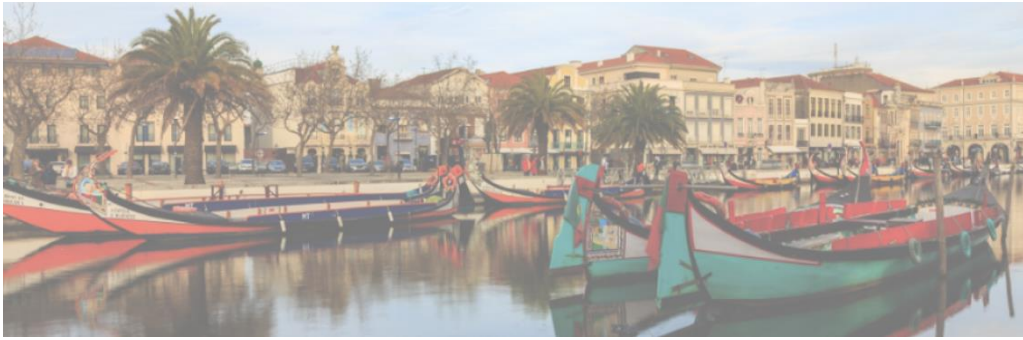
Abstract

Computational Thinking (CT) has emerged as a crucial skill in the 21st century, driving its inclusion in mathematics education across various countries (Forsström & Kaufmann, 2018), including Portugal. This integration, defined as a cross-cutting mathematical skill in the new curriculum guidelines, provides an opportunity for teachers to develop new knowledge and competencies. The Technological Pedagogical and Content Knowledge (TPACK) model (Koehler & Mishra, 2006) is relevant for understanding how teachers combine their knowledge to integrate CT into teaching practices. Despite the increasing importance of CT, research on its integration and teachers' pedagogical knowledge remains limited (Geraniou & Hodgen, 2022). My project work, which is in an initial phase, addresses this issue by focusing on the figure of the elementary mathematics teacher, aiming to document and analyze their ideas and practices related to CT, aligning with emerging guidelines and seeking to contribute to understanding in the field.

By characterizing the professional knowledge required for a proper integration of CT in the classroom, the study emphasizes the "voice" and practices of teachers. The goal is to understand what elementary mathematics teachers do during teaching activities when integrating CT-related dimensions.

Through the analysis of teachers' knowledge and practices, I aim to: a) Characterize the professional knowledge of elementary mathematics teachers related to computational thinking; b) Identify and analyze CT integration practices (strategies, tasks, resources, assessment) followed by elementary mathematics teachers in their teaching activities.

In this research, I will adopt a qualitative and interpretative approach, involving four case studies and utilizing data collection and analysis techniques appropriate to the nature of the study. The case studies will involve classroom observations of mathematics teachers, interviews with teachers, and document analysis.



This research is just beginning, and no empirical data has been collected yet. However, it will follow the ethical guidelines of the AERA (2011).

Keywords: computational thinking; mathematics teachers; TPACK; professional knowledge

References

AERA Code of Ethics: American Educational Research Association Approved by the AERA Council February 2011. (2011). *Educational Researcher*, 40(3), 145-156. <https://doi.org/10.3102/0013189X11410403>

Forsström, E. S., & Kaufmann, T. O. (2018). A Literature Review Exploring the use of Programming in Mathematics Education. *International Journal of Learning, Teaching and Educational Research*, 17(12), 18–32. <https://doi.org/10.26803/ijlter.17.12.2>

Geraniou, E., & Hodgen, J. (2022). *An exploratory study on mathematics teacher educators' beliefs and understandings about computational thinking*. TWG11(04). <https://hal.science/hal-03748436>

Koehler, M. J., & Mishra, P. (2006). Technological Pedagogical Content Knowledge: A Framework for Teacher Knowledge PUNYA MISHRA. *Teachers College Record*, 108(6), 1017–1054.