

Proceedings of the 17th International Conference on Technology in Mathematics Teaching



Editors: Alison Clark-Wilson and Christian Bokhove

St Paul's Girls' School

London, United Kingdom October 21–23, 2025

FROM PLAY TO PROFICIENCY: RETHINKING MATHS GAME DESIGN FOR FLUENCY	466
Sam Parkes	
A VIDEOGAME TO FOSTER ENGAGEMENT IN SECONDARY SCHOOL MATHEMATICS EDUCATION: A PROOF-OF-CONCEPT STUDY	467
Valeria Pucci, Silvia Baccaro, Robin Short, Leonardo Guidoni	
FROM BLOCKS TO ARGUMENTS – PROGRAMMING AS A PATHWAY TO REASONING IN PRIMARY MATHEMATICS	468
Simeon Schwob	
DYNAMIC GEOMETRY SOFTWARE AND PUPIL ENGAGEMENT IN MATHS CIRCLES	469
Josie Ruffles	
ARTICULATION BETWEEN MATHEMATICS AND TECHNOLOGY: COMPUTATIONAL THINKING FROM TEACHERS’ PERSPECTIVES	470
Marcela de Seabra; António Domingos, Manuel Vara Pires	
AUDIOFUNCTIONS 2.0: A MULTIMODAL ENVIRONMENT FOR INCLUSIVE MATHEMATICS EDUCATION	471
Alessandro Spagnuolo, Carola Manolino, Silvia Funghi, Mattia Ducci, Erika Brunetto and Cristian Bernareggi	
FROM FRUSTRATION TO FLUENCY: TEACHERS’ STRUCTURAL AND SYSTEMIC NEEDS	472
Eva Ulbrich, Mathias Tejera, Guillermo Bautista, Zsolt Lavicza	
DEVELOPING ADVANCED LEVEL MATHEMATICS TEACHERS USE OF DYNAMIC GRAPHING SOFTWARE THROUGH EDUCATIVE CURRICULUM MATERIALS	473
Sinéad Vaughan	
CHAT GPT IN THE CLASSROOM: SIMULATING DYSCALCULIA TO TRAIN TEACHERS IN THE EFFECTIVE USE OF GAME-BASED LEARNING	474
Sara Vergallo, Ottavio G. Rizzo	
DIGITAL TOOLS IN COMPUTER-ASSISTED CALCULUS LEARNING: INSIGHTS ON AFFORDANCES FROM A COMPUTATIONAL THINKING PERSPECTIVE	475
Qi Zhai, Jietong Luo, Allen Leung, Oi-Lam Ng	

ARTICULATION BETWEEN MATHEMATICS AND TECHNOLOGY: COMPUTATIONAL THINKING FROM TEACHERS' PERSPECTIVES

Marcela de Seabra; António Domingos, Manuel Vara Pires

Transdisciplinary Research Center in Education and Development (CITeD), Polytechnic Institute of Bragança; FCT NOVA, EDUNOVA.ISPA, CICS.NOVA, NOVA University of Lisbon; Transdisciplinary Research Center in Education and Development (CITeD), Polytechnic Institute of Bragança; cseabra@ipb.pt, amdd@fct.unl.pt, mvp@ipb.pt

ABSTRACT

The digital transformation of the 21st century positions Computational Thinking (CT) as a core competency for modern literacy (Wing, 2006). This study explores how CT reshapes mathematics teaching by bridging technology, pedagogy and content knowledge (Weintrop et al., 2016; Ye et al., 2023), using the Technological Pedagogical Content Knowledge (TPACK) framework as its theoretical foundation. The objectives are: (a) Which didactic practices and tools do teachers use? (b) How does their TPACK influence CT integration? This qualitative case study of four elementary teachers triangulates data from observations, interviews and document analysis. Findings will inform teacher training and tool design, showing that effective CT depends on teachers' capacity to meaningfully connect mathematics and technology. The study and its empirical data collection follow rigorous ethical principles and are currently ongoing.

Keywords: Computational Thinking, Mathematics Education, TPACK Framework, Teacher Professional Development

ACKNOWLEDGEMENT

This work has been supported by FCT – Fundação para a Ciência e Tecnologia through the individual research grant: 2024.01567.BD.

REFERENCES

- Weintrop, D., Beheshti, E., Horn, M., Orton, K., Jona, K., Trouille, L., & Wilensky, U. (2016). Defining computational thinking for mathematics and science classrooms. *Journal of Science Education and Technology*, 25(1), 127–147. Scopus. <https://doi.org/10.1007/s10956-015-9581-5>
- Wing, J. M. (2006). Computational thinking. *Communications of the ACM*, 49(3), 33–35. <https://doi.org/10.1145/1118178.1118215>
- Ye, H., Liang, B., Ng, O.-L., & Chai, C. S. (2023). Integration of computational thinking in K-12 mathematics education: A systematic review on CT-based mathematics instruction and student learning. *International Journal of STEM Education*, 10(1). <https://doi.org/10.1186/s40594-023-00396-w>