

CONCEPT CARTOONS IN THE TEACHING OF MATHEMATICS EDUCATION RESEARCH FINDINGS ON GEOMETRY

Verónica Molfino

Consejo de Formación en Educación

Understanding how prospective mathematics teachers (PMTs) interpret research findings is a key challenge in Mathematics Education. While mathematics teaching generates extensive research, the pedagogy of teaching these findings to PMTs remains underexplored, with teacher educators often relying on a "show and tell" approach. Drawing on Ochoviet & Parodi (2024), this paper presents preliminary findings from an ongoing study that employs concept cartoons (Naylor & Keogh, 2013) to engage PMTs with Wilson's (1990) research on inconsistent ideas about geometric definitions.

The study adopted a qualitative exploratory case study design, involving seven PMTs enrolled in a final-year teacher education course. Data generation centred on a sequence of three concept cartoons depicting PMTs discussing authentic student productions on geometrical definitions. Participants' written responses to the CCs and transcriptions of the audio-recorded plenary discussions were analysed following a thematic approach: open coding was first employed to identify emergent patterns, after which axial coding enabled the grouping of these patterns into coherent categories, which were subsequently interpreted in light of Wilson's (1990) framework.

Analysis of data reveal how PMTs progressively identified five key difficulties: transition between definition and representation; set inclusion; deeply-rooted conceptual prototypes; construction of definitions; and testing of definitions. These closely mirror Wilson's (1990) sources of student inconsistency: implications in definitions, imprecise language, strong prototypes, and logical reasoning difficulties, yet emerged spontaneously from PMTs' interpretations. The findings suggest that CCs constitute a productive context for eliciting pedagogical content knowledge, offering a low-stakes alternative to traditional practices that deepens PMTs' sensitivity to student cognition.

References

- Naylor, S. & Keogh, B. (2013). Concept cartoons: what have we learnt? *Journal of Turkish Science Education*, 10(1), 3–11.
- Ochoviet, C. & Parodi, S. (2024). Viñetas conceptuales para la enseñanza de la didáctica de la Matemática. *Revista Binacional Brasil-Argentina: Diálogo entre as ciências*, 13, 386-413.
- Wilson, P.S. (1990). Inconsistent Ideas Related to Definitions and Examples. *Focus on learning problems in mathematics*, 12, 31-47.