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Boundary objects and boundary crossing for numeracy teaching.

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Summary: In this paper, we share analysis of an episode of a pre-service teacher's handling of a map artefact within his practicum teaching of 'Mathematical Literacy' in South Africa. Mathematical Literacy, as a post-compulsory phase subject in the South African curriculum, shares many of the aims of numeracy as described in the international literature – including approaches based on the inclusion of real-life contexts and a trajectory geared towards work, life and citizenship. Our attention in this paper is focused specifically on artefacts at the boundary of mathematical and contextual activities. We use analysis of the empirical handling of artefacts cast as 'boundary objects' to argue the need for 'boundary crossing' between mathematical and contextual activities as a critical feature of numeracy teaching. We pay particular attention to the differing conventions and extents of applicability of rules associated with boundary artefacts when working with mathematical or contextual perspectives. Our findings suggest the need to consider boundary objects more seriously within numeracy teacher education, with specific attention to the ways in which they are configured on both sides of the boundary in order to deal effectively with explanations and interactions in classrooms aiming to promote numeracy.

Classification: D39 M19 C39 C49

Keywords: mathematical literacy; numeracy; boundary object; boundary crossing; pre-service teacher education

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