

Orchestrating Mediation Means in Solving a Mathematical Problem

Sally-Ann Robertson

Rhodes University

s.a.robertson@ru.ac.za

Mellony Graven

Rhodes University

m.graven@ru.ac.za

Working as we do in an interdisciplinarity space, the first author being involved in second language teaching and learning, the second author a mathematics educator, we see MERGA 45's theme: 'Weaving mathematical education research from all perspectives' as aligning well with our shared focus on the ways in which teachers and their learners use language and other semiotic modes in making mathematical meaning. Research highlights the need to provide learners with opportunities to participate in mathematical talk and to engage in what Mercer (2000) termed 'interthinking' around the mathematical ideas they encounter. Research also shows, however, that learners often struggle to verbally articulate their thinking. Walshaw and Anthony (2008, p. 254), for instance, observed that many children "were decidedly ill at ease [about sharing] their thinking with others". While this may apply even in contexts where learners are proficient users of the language of teaching and learning, it applies even more so where learners are in a second language teaching and learning environment and are still in the process of gaining proficiency in that additional language. In either situation, teachers need to take on the responsibility of helping to induct their learners into appropriate ways of participating in mathematical dialogue.

There is growing recognition that communication almost never happens via words alone: it is intrinsically multimodal. We locate our own work within a broadly socio-cultural framework whereby we accept the view that learning is a social process of co-construction requiring mediation from more knowledgeable others (Vygotsky, 1978). Venkat and Askew (2018) identify four key mediational means for primary mathematics teaching: (1) tasks and example spaces, (2) artifacts, (3) inscriptions, and (4) talk (in which they include gesture). We focus particularly on the latter three in our highlighting of some of the ways in which these three mediational means were orchestrated in the course of a primary after-school mathematics club session. We explore how the problem-solving task used in the session was mediated through a combination of these means, enabling the club members to successfully navigate their way towards solving the mathematical challenge set them. In our presentation we will share our multimodal analysis of selected transcripts taken from the full transcription of the club session videotape. The session was conducted primarily in English, and our analysis illuminates the ways in which the club facilitator (second author) built in the added support of artifacts, inscriptions, gesturing, and translanguaging to help mediate the linguistic challenges facing the club members, none of whom were first language users of English nor yet particularly adept at engaging in mathematical talk. We drew on multimodal and second language acquisition analytic frames to examine how the orchestration of the mediational means enabled interthinking.

References

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