Abstract

Research has established a close link between talk and cognition; that talk is central to the meaning-making process and thus to learning science. However, the challenge is shifting teacher pedagogical practices to those that promote meaningful learner talk and mediate substantive engagement with science concepts. Research suggests that long-term school based teacher support programmes do bring about changes in teacher beliefs and classroom practices. My study was part of a five year project to investigate teaching strategies for the implementation of South Africa's new science curriculum in Soweto high schools. Taking a socio-cultural perspective I sought to understand the use of science talk as a tool for teachers to mediate meaningful engagement with and understanding of high school science. I investigated teacher-learner interactions in three experienced teachers' classrooms following their participation in the intervention programme. I wanted to understand how they used talk to create dialogic discourse and how meaning making was negotiated within this discourse. Taking a collaborative research approach I used case study methodology to collect and analyse observational data from each teachers' lessons. Data analysis was informed by Mortimer and Scott's model for analysing classroom interactions and Toulmin's Argument Pattern (TAP). My findings indicated that classrooms had become interactive. Although teachers took up a largely authoritative stance there was tendency to a dialogic communicative approach. That is, while traditional IRE discourse persisted, there was significant evidence that teachers created dialogic discourse (eliciting and taking up learners' ideas). Teachers both opened up and shut down talk, through evaluative and elaborative feedback, respectively. I observed the emergence of spontaneous argumentation in two teachers' lessons. Argumentation differed from forms reported in literature in two significant ways. First, arguments were co-constructed by the teacher and learners and secondly, an unusual form of argumentation to make sense of conventional science concepts as opposed to the usual argumentation on socio-scientific issues as observed in local South African studies so far. Whereas most argumentation research has focused on the structure of arguments constructed by individual participants, I observed arguments co-constructed collaboratively by several participants. These findings have been published in a peer reviewed journal. A further, unrecorded finding for South Africa was engagement in talk within hybrid spaces, which are combinations of formal scientific ways of talking with context-based and culturally informed forms of talk. Lastly, science talk was enriched in these classrooms by linking it to other forms of engagement, such as reading, writing, practical activities and computer technology. This too has not been reported in South Africa. Some methodological findings emanating from my study included the positive effects of the model adopted by the Project on Implementation of Curriculum Change (ICC Project). The project employed a model of sustained on-site teacher support, systematic teacher-researcher collaboration, co-teaching and modelling of teaching strategies. I also discuss the implications of my findings for teacher professional development as well as for science teacher education in South Africa and further afield.

Keywords

Argumentation; classroom interactions; dialogic; hybrid spaces; interactive; pedagogic shifts; science talk; teaching strategies