



Curriculum materials support teachers in the promotion of argumentation in science teaching: A case study



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HIGHLIGHTS

- Argumentation scarcely occurs in science classrooms.
- Initiatives focused on promoting classroom argumentation report modest successes.
- Curriculum materials support teacher's use and orchestration of argumentation.

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ABSTRACT

This case study set out to explore the potential of curriculum materials to scaffold classroom argumentation in a primary-school science classroom in Chile. One teacher and thirty students participated in the study. The teacher was given curriculum materials especially designed to foster argumentation during the teaching of physics. Lessons were videotaped and classroom discourse analysed. The analyses show that the teacher was progressively able to promote argumentation, both in whole-class and group-work interactions, from lesson 1: argumentative interactions were increasingly responsive and engaging, and the teacher's group supervision was progressively argumentatively oriented. The implications for professional development are discussed herein.

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1. Introduction

Argumentation, as the discursive practice aimed at increasing (or decreasing) the acceptability of controversial standpoints (van Eemeren & Grootendorst, 1992), has been recognised as both the means and the goal of science education (Driver, Newton, & Osborne, 2000; Jiménez-Aleixandre & Erduran, 2008; Osborne, Simon, Christodoulou, Howell-Richardson, & Richardson, 2013). Consequently, national initiatives in different countries have included argumentation as one of the key goals of science teaching. The problem is that argumentation scarcely occurs in science classrooms (Larrain, Freire, & Howe, 2014; Roth, Druker, Garnier, & Gallimore, 2006). So the question is why – after decades of

advancing argumentation as a key goal of science education, and arguing for the need to *argue to learn science* – is it scarcely exercised in classrooms?

Argumentation is a discursive activity that emerges when speakers, in order to deal with controversial issues, provide additional pieces of discourse to support a given claim (see Leitão, 2000; Toulmin, 1958). Part of the problem is that argumentation is a type of language that is highly sensible to context, requiring specific conditions in order to emerge: a polemic theme; indetermined discussion's outcome; participants' dispositions to change their views; familiarity with the audience; specific interactional goals; argumentative instructions; previous knowledge; and participants' symmetric relations, among others (see Andriessen & Coirier, 1999; Asterhan & Schwarz, 2016; Leitão, 2009). Classrooms do not normally accomplish these conditions so in order to promote argumentation in classrooms a careful design is needed (Andriessen & Schwarz, 2009; Leitão, 2009).

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