

Attending to the Language Demands in Science Classrooms

Seah Lay Hoon

KEY IMPLICATIONS

- To address language demands embedded in science learning, it is helpful for teachers to plan in advance and incorporate into their lesson plan strategic points where particular language demands can be highlighted.
- When supporting teachers in attending to the language demands of science, there is a need to surface and challenge teachers' assumptions about how students can learn to use scientific language.

BACKGROUND

Few studies examine the process in which science teachers select, integrate and implement available pedagogical practices and resources in their own lessons upon being introduced to them. Without an understanding of this process, it will be hard to specify what skills and knowledge teachers would need in order to effectively design and execute science lessons with a focus on addressing language demands.

FOCUS OF STUDY

In this study, we are interested in how teachers perceive their lesson design and implementation process that has the explicit aim of addressing the language demands of science. Specifically,

we examined what teachers focus on when examining the language demands and how they perceive and integrate the strategies and learning activities that could be adopted to address these language demands. A collaborative design approach was adopted in which we worked with teachers on a weekly basis to explore the language demands of a science topic, and develop and critique ways to address these demands through instruction.

KEY FINDINGS

The teachers collectively displayed a strong awareness of the nature of language challenges their students may face. Generally, they were concerned with four main kinds of language demands: technicality, grammar, construction of sentences, and understanding of questions. However, level of awareness varied among individuals.

Despite the sharing of language demands specific to a topic among the teachers, there were both similarities and differences in the extent and nature of ways in which individual teachers attended to the language demands in their lessons. Analysis of the activities and tasks shows that those by one teacher (T1) were relatively more goal-oriented and structured as compared to

another who provided less structures and scaffolding to the students. Similarities among the teachers' talk relate mainly to their concern for the body of technical terms that the topic of Human Circulatory System entails. Differences among the teachers' talk relate to the content and purpose of talk and the use of students' language as teaching resources.

T1 stands out for her more consistent and wide-ranging approach to providing language support in her lessons. Nonetheless, despite her students' out-performing other classes in their pre- and post-test scores for a sub-topic in which she conducted interventions involving language-focused student-centred activities, the teacher remained sceptical about the learning gains of her students. Her scepticism appeared to be related to her sense of insecurity in employing a less teacher-directed approach to instruction.

SIGNIFICANCE OF FINDINGS

Implications for Practice

This study highlights the importance of teachers' abilities to plan ahead and incorporate into their lesson plan strategic points where particular language demands can be highlighted.

Implications for Research

Supporting teachers in addressing the language demands of science require surfacing teachers' assumptions about how students learn. More specifically, there is a need to surface and challenge teachers' assumptions about how students can learn to use scientific language in classrooms.

Proposed Follow-up Activities

Develop and provide framework for science teachers to make sense of and address the disparate language challenges their students may encounter.

PARTICIPANTS

Five Science teachers and 70 Secondary 3 Combined Biology students participated in this study.

RESEARCH DESIGN

A case study methodology was employed in this study in which multiple data sources, including lesson recording, recording of researcher-teacher meetings, teacher interview, student survey, pre-and post-tests, were used to understand the complex process of lesson design and implementation, which foregrounded the language demands of science.

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This brief was based on the project OER 16/14 SLH: Understanding How Teachers Design Lessons in Response to the Language Demands of Science.

How to cite this publication

Seah, L.H. (2017). *Attending to the Language Demands in Science Classrooms*. (NIE Research Brief Series No. 17-023). Singapore: National Institute of Education.

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