

A Study of Teacher Questioning in Lower Elementary Out-of-School-Science Learning Spaces

Classroom Interaction, Student Responses and Insects



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Related literature

Chin, C. (2006). Classroom Interaction in Science: Teacher questioning and feedback to students' responses. *International Journal of Science Education*, 28(11), 1315- 1346.
Carlsen, W. S. (1991). Questioning in classrooms: A sociolinguistic perspective. *Review of Educational Research*, 61(2), 157-178.
Haug, B. S. (2014). Inquiry-Based Science: Turning Teachable Moments into Learnable Moments. *Journal of Science Teacher Education*, 25(1), 79-96.
Kampourakis, K., & Niebert, K. (2018). Explanation in biology education. In K. Kampourakis & M. Reiss, *Teaching biology in schools: global research, issues, and trends* (pp. 237-248). CRC Press.

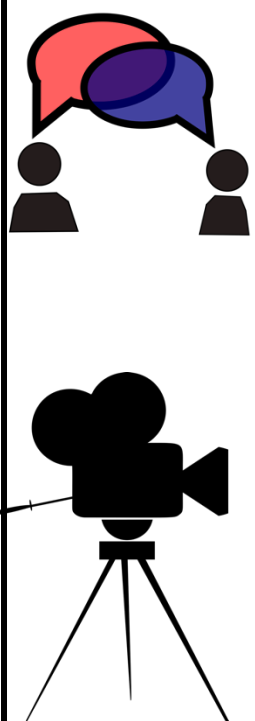


Why exploring Teacher Questioning Practices in Lower Elementary Classrooms?

- They are a key element in dialogic teaching and require reflective practice.
- We still know little about how teacher questions can be orchestrated along content, student responses and context to forward students' learning (Carlsen, 1991; Chin, 2006).

Research Question

How do teacher questions, pattern of interaction, content, and student responses interact to support or constrain lower elementary students' reasoning about bugs and insects?



Data collection

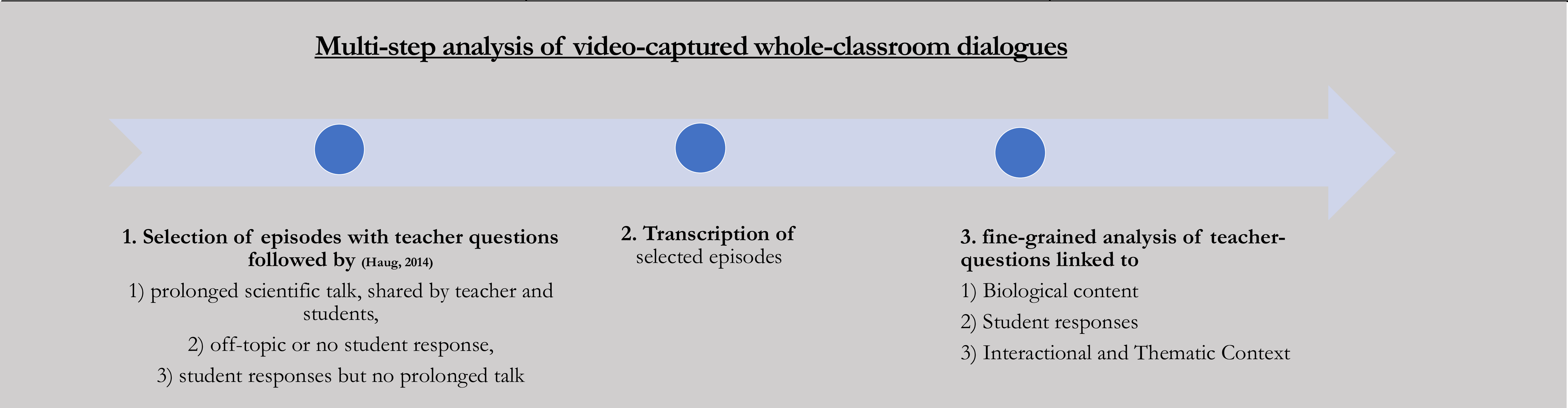
10 hours of video data of whole-classroom dialogues

One teacher and two classes of lower elementary students

in out-of school IBSE-learning spaces

Preliminary findings

- **Constraining:** undefined content, mainly “what-questions”, students describe, potential of responses is overlooked
- **Supporting:** what-why-and how-questions, accessible language, students' describe, explain, propose



Speaker	Utterance	Unit of Analysis
Teacher	(shows selected students' results of group work: sorting insects based on own criteria) How do you other students think that student 3 and 4 have sorted? What do you think , student 1?	Biological Context (Procedure of sorting insects) Dialogic interaction
Student 1	They have thought with their heads.	Explicit invitation to reason to one student
Teacher	They must have thought with their heads. I think so too, but what animals have they put together? Or why do you think they have put together, for example, the ones at the top?	Dialogic interaction: Repetition, no evaluation, agreement,
Student 1	I'm guessing that (unintelligible) that... I think that maybe they are in the soil.	Explicit guiding towards biological context (But what animals?) Alternation of biological questions (What, why)
Teacher	In the soil, yes, so perhaps they have taken the one who live in the soil together and a few other things perhaps. Does anyone else have any idea on how they think they might have sorted?	Explicit reasoning about relevant biological concept (Some insects live in the soil) Invitation for other students to join

Table 1 Transcript of episode where teacher questions are linked to content, interaction processes and context in a way they support student reasoning

Open questions for discussion

- If there is no distinction into good/bad questions, how can we integrate findings from contextualised teacher question research into teachers' disciplinary professional development?
- What are suitable ways of observing teacher questions in the classroom?
 - What purposes do teachers have when asking questions?