Verbal Explanatory Competence in Science Education at Primary School
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PURPOSE
The purpose of the study is to investigate how primary school students from the grade 1 through 4 explain scientific phenomena and how their explanations are structured.

CENTRAL ASPECTS OF EARLY SCIENCE EDUCATION

Supporting the development of ...

- scientific literacy
- communication about scientific phenomena

Content teaching and language education must be connected.
(Quavell & Rojas, 2015)

Theoretical Framework

- linguistic (explanatory) precursor skills are already measurable from the age of two:
  verbalisation of simple causal connections
  (Klein, 2017)
- observing discourse skills from grade 1 through 3:
  improvement of completeness of content and structure of explanations
  (Föhren, 2009)
- scientific reasoning skills (4th grade):
  to understand a phenomenon does not mean to be able to explain it
  (Günter, 2016)

CURRENT GAPS IN RESEARCH:
There is a need to know, how primary school students explain scientific phenomena in early science education and how they can be supported to generate adequate explanations.

RESEARCH QUESTIONS

RQ 1: How do primary school students explain scientific phenomena?
- How do primary school students structure their explanations in terms of content adequacy?
- How do primary school students structure their explanations in terms of language adequacy?

RQ 2: What are the differences in the development of the students’ explanatory skills from grade 1 through 4?

DESIGN

Step 1 recording of student explanations (from grade 1 through 4)

Pilot Study

Step 2 content analysis of the student’s explanations inductive category formation

Content Analysis in Progress Up to Now: Initiated Textwork

Step 3 getting an overview of the development of explanatory competences from grade 1 through 4

Main Survey Category System

RESEARCH QUESTIONS

Sample:
- 55 students (from grade 1 through 4)
- 56% female

Content:
- video showing the change of states of water
- evaporation of water on a black board

Open Questions:
- Is it possible to reduce the difference of authority between student and interviewer by using a hand puppet as a recipient?
- Should the prior knowledge be controlled by using a teaching unit?
- Should further phenomena be considered to control possible content effects?

Next Steps:
- revision of the interview guideline
- adapt the survey process under consideration of the open questions
- inductive category formation to develop a category system

REFERENCES:


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