

8 - Scientific Literacy and Socio-scientific Issues | Empirical

SP - (15881) - DIFFICULTIES IN EVALUATING DATA – WHERE DO STUDENTS NEED SUPPORT?

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Short Abstract

The evaluation of data is an essential component of scientific reasoning. To perform adequately when faced with this task, students need to apply procedural, epistemic as well as content knowledge to come to valid results. Processing and interpreting the data, drawing conclusions, and assessing the generalisability of the resulting claims pose specific demands at the students. It has been shown that these procedures of evidence evaluation are difficult for them in multiple regards. However, research has so far focused on students up to middle school. Besides, the way in which these difficulties interplay with students' knowledge in the above-mentioned domains has not yet been extensively investigated.

For this reason, a video study of students from German upper secondary school (N = 100, age typically 16-18) is currently being implemented with the aim of identifying difficulties students show when engaged in the evaluation of data. Groups of two students will carry out prescribed experiments that test hypotheses about the acidity of salt solutions. They will then be asked to evaluate their data with the aim of formulating claims about the investigated phenomenon. Video data of their activity and communication will be analysed qualitatively regarding the emergence of difficulties. The occurrence of these difficulties will then be subjected to analyses concerning its correlation to students' procedural, epistemic and content knowledge as measured by three scales adapted from existing instruments. The prospective evidence on students' reasoning while evaluating data will potentially be beneficial for the future development of corresponding measures of support.