7 - Discourse and Argumentation in Science Education | Empirical

SP - (15746) - FACTORS AFFECTING THE ASSESSMENT QUALITY OF STUDENTS' SCIENTIFIC ARGUMENTATION COMPETENCY

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Short Abstract

Argumentation plays a central role in science education because it leads students toward deep learning by engaging them in the practice of constructing and evaluating scientific arguments. There has, however, been little study on developing assessment instrument for this practice despite the growing interest in the topic. Here, the author proposes the factors that should be considered to improve the assessment of scientific argumentation competency (SAC) based on a three round qualitative study in an iterative process of developing a SAC assessment instrument. In this study, SAC is decomposed into three components with hypothesised increasing cognitive demand: Identification of SA, Evaluation of SA and Production of SA. Each component is composed of four argumentation elements according to Toulmin's Argumentation Pattern. By analysing data from interviews of teachers, cognitive think-aloud interviews of students, responses to test papers and followup interviews of students in each round of the study, the instrument was modified and prepared for the next round of the study. All the interview data were collected using video/audio calls, and transcribed. The author analysed all the interview, and no new factor that contributes to the instrument improvement was found in the third round of the study. Overall, 10 factors are considered important to improve SAC assessment instrument design. The author argues that these factors provide detailed information in supporting SAC assessment research although its universality has not been tested.