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“We clicked right away” – a digital learning environment for collaboration to observe and foster conceptual reconstruction

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Abstract

Dealing with student conceptions is a central element of student-oriented teaching - everyone agrees on that. However, the implications for classroom design have not yet been fully elucidated. First approaches, such as the conceptual change theory, have over the years been supplemented by a variety of affective and motivational factors. Little is known about the mechanism linking these factors. This qualitative study aims to shed light on the process of conceptual reconstruction. Therefore, learners were given an assignment on the topic of plant nutrition and the task of collaborating to develop a jointly supported solution. In order to study changes in conceptions, the Peer-Interaction-Method (PIM) was used. It requires that only learners with different conceptions work together in order to cause a content related conflict. The expressions of the participants were examined from the perspective of the conceptual metaphor theory – a cognitive linguistic theory of understanding. The results show an unexpected result: the anticipated content-related conflicts do not have to occur in order to reach a jointly supported solution. Instead, we can show that a social conflict shapes the development of the collaboration process. Furthermore, the peer interaction method turns out to be a constructive and fruitful way of dealing with subject-specific heterogeneity in conceptions. To provide the necessary infrastructure for the matching of learners with different conceptions in the school context, we have developed a digital plug-in for moodle e-learning platforms. It not only allows the peer interaction method to be applied in a classic 45-minute time frame, but also offers opportunities for collaboration between research institutions and schools.