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Multimedia design in chemistry teacher training –a new teaching concept on evaluating one's own teaching material trough eye-tracking

In chemistry and science in general, instructions are often presented with multiple external representations, such as texts and pictures in static or dynamic ways. Several well-established theories, for example, the Cognitive Theory of Multimedia Learning (Mayer, 2009), the Cognitive Load Theory (Chandler & Sweller, 1991), or the Design-Functions-Tasks Framework (Ainsworth, 2006) help designing learning and teaching materials, arranging multimedia elements in terms of coherence, highlighting, contiguity, and minimizing extraneous processing (Mayer, 2009). Multiple design principles for learning materials have been confirmed by eye-tracking data (Desjarlais, 2017; Alemdag & Cagiltay, 2018) and are often taught as guidelines to design instructional materials in student teacher training courses –however, they can only be limitedly verified by students. In order to put student teachers in the position of testing their own teaching materials, a new course was developed in which the student teachers use eye-tracking to determine the effects of differently designed learning materials on the learner's perception.

Within the context of a small empirical study, the seminar participants first design tasks with and without respecting multimedia design principles. Afterwards they track the eye movements of learners during problem solving and analyze the attention, perception and strategy when working with these learning materials in order to reflect on the design principle and the usability of the designed teaching material.

First experiences and evaluations of the seminar are presented and implications for teaching are discussed.

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