The effects of a self-regulation training on strategy knowledge and cognitive load – does the socio-economic status matter?

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Theoretical background

In self-regulated learning (SRL), learners monitor, regulate und control their cognition, their motivation and their behavior in relation to their learning goals and contextual conditions (Pintrich, 2000). Empirical studies show that these cognitive and metacognitive competences are trainable (e.g., Dignath et al., 2008). However, there is empirical evidence that the acquisition of SRL competences is affected by individual differences such as socio-economic status (SES; e.g., Artelt, 2001; Karlen, 2014). In literature, it is discussed that students with low SES lack SRL competences because of, for instance, missing parental help when planning, organizing and reflecting learning actions at home. When it comes to SRL, those students might be rather cognitively overloaded than students with higher SES. Therefore, we suggest cognitive load theory (CLT; Sweller, 1988) might lead to new insights about the understanding of individual differences when acquiring SRL competences.

Research questions

Studies that examine the relation between SRL and SES in the light of CLT are missing. Therefore, as a first step, focusing on SRL competence and cognitive load as dependent variables, we examine differential training effects due to students' SES. According to Karlen et al. (2014) we expect prior differences in SRL competences as well as cognitive load between students with high and low SES. High SES students are assumed to possess better SRL competences and report less cognitive load than low SES students. Furthermore, we expect the training – although not desirable – to be more beneficial for students with high SES (Matthew effect).

Methodology

338 German fifth and sixth grade students (M = 10.4 years; SD = .54; 49.7% female) were trained over one school term in SRL. The training is well evaluated in laboratory and practical school settings, and is contextually connected to science classes (Stebner et al., 2015). The independent variable SES was measured with 10 items reflecting the families' cultural capital (PISA, 2003). The dependent variables were measured twice, before and after the training. SRL competence was measured with an open answer format in which students were asked to describe their learning process when conducting science experiments. We analyzed the students' use of cognitive and metacognitive strategies (Cronbach's alpha = .620). Cognitive load was measured after filling in each SRL competence test, asking how difficult it was to describe the learning process (Kalyuga et al., 1999) and how much mental effort students invested in filling in the test (Paas, 1992).

Results

In comparison to Karlen et al. (2013), there are no significant differences between low and high SES students in terms of SRL competence, perceived difficulty and mental effort at the first measurement point ($V = .002$, $F(3, 334) = .217$, $p = .885$). As the second measurement will take place after about 15 weeks of training in July 2017, the entire interaction will be presented in Wollongong.