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Can highly intelligent and high-achieving students benefit from training in self-regulated learning in a regular classroom context?☆

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ABSTRACT

We examined if highly intelligent and high-achieving students benefit from training in self-regulated learning conducted in regular classrooms as much as their peers of average intelligence and with average scholastic achievement. Fourth-graders participating in a training program of self-regulated learning (SRL, $n = 123$) were compared with fourth-graders receiving regular classroom instruction (REG, $n = 199$) in a pretest, posttest, follow-up design. Students in the SRL group practiced self-regulated learning while working on identifying main ideas in expository texts. The training was effective for highly intelligent and high-achieving students as well as for their peers of average intelligence and with average scholastic achievement. Highly intelligent students benefited in their preference for self-regulated learning only in the long run; for high achievers, we found immediate and long-term effects. Both highly intelligent students and high achievers identified more main ideas correctly in the course of the training. We recommend this program for use by classroom teachers in heterogeneous classrooms.

1. Introduction

Self-regulated learning (SRL) represents a key skill in our rapidly changing society, where lifelong learning has become necessary for everyone (e.g., Council of the European Union, 2002). SRL-skills are therefore important for all students and should be fostered as early as possible. Accordingly, SRL competencies are part of elementary school curricula in several countries (e.g., in Germany: Bayerisches Staatsministerium für Unterricht und Kultus, 2000, 2014) and numerous empirical studies show that SRL can be effectively taught to elementary school students (for an overview cf. Dignath, Buettner, & Langfeldt, 2008). However, few studies exist that explore the effectiveness of SRL interventions in elementary school for students with differing cognitive abilities and achievement levels.

Existing studies on differential effects of SRL training mostly focus on low-achieving elementary school students and students with learning difficulties (e.g., Antoniou & Souvignier, 2007; Graham, Harris, & McKeown, 2013; Rogers & Graham, 2008). However, comparatively little is known about the effectiveness of SRL training for highly intelligent or high-achieving students. In particular, there are – to the best of our knowledge – no studies examining if and how highly intelligent and high-achieving students benefit from SRL training conducted in a regular classroom context. The aim of our study was therefore to test the effectiveness of an SRL training program that was already successfully implemented in regular elementary school classrooms (Stoeger, Sontag, & Ziegler, 2014), for highly intelligent students and for high-achieving students. We will treat highly intelligent students and high-achieving students as two distinct groups with possible overlap: Highly intelligent students may or may not also be high achievers, and high achievers may or may not also be highly intelligent.

1.1. Is it necessary to teach SRL to high-achieving and highly intelligent students?

We understand SRL as an active process, in which students accept responsibility for their own learning by actively setting goals, and by then planning, monitoring, regulating and evaluating their learning progress (cf. Boekaerts, Pintrich, & Zeidner, 2000). Although many current models of SRL comprise cognitive, metacognitive, motivational and emotional aspects of SRL (cf. Boekaerts et al., 2000), we chose to focus on the combination of cognitive and metacognitive strategies, as they seem to be of particular importance for elementary school students (Dignath & Büttner, 2008).

It is often assumed that highly intelligent and high achieving students know more about learning strategies and self-regulated learning than their peers and that they optimally shape and regulate their learning process without outside help. Sometimes it is also assumed that highly intelligent and high-achieving students do not need learning strategies to succeed in regular classroom settings (cf. Treffinger, 2009). However, research findings only partially confirm these assumptions (for overviews cf. Hoh, 2008; Stoeger & Sontag, 2012; Veenman, 2008).

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On average, highly intelligent and high-achieving students do seem to possess more metacognitive knowledge – a prerequisite of SRL – and understand better why strategies are useful (for an overview, cf. Alexander, Carr, & Schwanenflugel, 1995). However, this does not mean that they actually use SRL strategies more often or better than their peers. Sontag, Stoeger, and Harder (2012) showed that highly intelligent students (top 5% in an intelligence test) did not prefer SRL over other forms of learning in regular classroom instruction and that they did not prefer SRL more than their peers in the same classrooms. In a study by Zimmerman and Martinez-Pons (1990), highly intelligent (top 1% in an intelligence test) high achievers from a school for academically gifted students reported using some strategies more often than their peers, but there were no differences in the reported use of other strategies. Bouffard-Bouchard, Parent, and Larivée (1993) studied the actual behavior of highly intelligent students (top 11% in a test of mental ability) and their peers of average intelligence in a learning task and also found that highly intelligent students outperformed their peers only in the use of some strategies, but not in the use of others. Regarding the question if highly intelligent and high-achieving students need to self-regulate their learning to be successful, evidence suggests that in some, relatively unchallenging contexts SRL is in fact not necessary to attain high achievement (Ablard & Lipschultz, 1998; Stoeger, Steinbach, Obergriesser, & Matthes, 2014).

However, although in certain contexts, highly intelligent and high-achieving students do not need to self-regulate their learning to be successful, it is justified to assume that SRL will become necessary in more challenging contexts (e.g., gifted tracks, selective universities) (cf. McCoach & Siegle, 2003; Spörer, 2003). Findings from expertise research (e.g., Zimmerman, 2006) indicate furthermore that SRL is indispensable to achieve excellence in a certain domain. Therefore, SRL training is also relevant for highly intelligent and high-achieving students. In the following section, we will report intervention studies with highly intelligent and high achieving students.

1.2. Can highly intelligent students and high-achieving students benefit from SRL interventions?

To the best of our knowledge, there are no studies examining if and how both highly intelligent and high-achieving students benefit from SRL training conducted in a regular classroom context. There are studies, however, that – taken together – suggest that both highly intelligent and high-achieving elementary school students could in fact benefit from such interventions as much as their peers. The interventions examined in existing studies fall into three categories: short one-on-one trainings of cognitive strategies; trainings in which cognitive and metacognitive strategies were practiced in small groups; trainings conducted in a regular classroom context with students of above-average intelligence and with underachieving students.

Highly intelligent and high-achieving students seem to benefit from the training of cognitive strategies in one-on-one settings at least as much as their peers. McCauley, Kellas, Dugas, and DeVellis (1976) reported an experiment, in which fifth- and sixth-graders practiced a rehearsal strategy in two one-on-one sessions scheduled in the same week. Both students of above-average intelligence (IQ ≥ 115) and students of average intelligence (IQ ≤ 95) benefited from the practice sessions, with students of above-average intelligence benefiting slightly more ($p < .07$). Scruggs and Mastropieri (1988) trained high-achieving fifth- and sixth-graders (SAT math or reading percentile rank ≥ 94) and their peers with average scholastic achievement (with average SAT math scores corresponding to the 59th percentile, and average SAT reading scores corresponding to the 55th percentile) in the use of a rehearsal strategy during one one-on-one session. They found that both high achievers and students with average scholastic achievement benefited from the training, with a greater training benefit for the high-achieving students.

Highly intelligent and high-achieving students can also benefit from SRL training conducted in small-group settings. Schunk and Swartz (1993b) conducted a program with gifted fourth-graders that had been proven effective for regular fourth-grade students (Schunk and Swartz, 1993a). Participants were students from two gifted classrooms (PR ≥ 98 in a score combining the results of a cognitive ability test and a reading test) who were randomly assigned to one of three experimental conditions. All students received 20 sessions of 45 min of cognitive writing strategy instruction in small groups delivered by teachers from outside the school. One group of students was instructed to monitor their strategy use and received feedback on their writing strategy use (SRL condition); the second group was instructed to monitor their strategy use but did not receive strategy feedback (partial SRL condition), and the third group of students was not instructed to monitor their strategy use and did not receive strategy feedback (cognitive strategy condition). Students in the SRL condition outperformed students in the other two conditions in writing achievement, writing strategy and motivational variables. Fischer (2008) reported two interventions in which gifted students practiced SRL in small groups. The first program was a three-day extracurricular intensive course designed according to the needs of gifted students with learning difficulties of grades three through nine. Pre-test–post-test comparisons showed improvements in strategy knowledge and in scholastic performance for participating students (intelligence test scores: $M = 132.48$, $SD = 9.33$); results for a control group were not reported. In the second program, gifted students (intelligence test scores: $M = 123.59$, $SD = 1.87$) in grades three to six were pulled out for one ninety-minute block of regular school instruction per week over the course of an entire school year in order to participate, in small groups, in a program promoting SRL. In comparison with their non-gifted peers who stayed in regular instruction and did not participate in the program, the gifted students showed greater improvements in their strategy knowledge, their learning behavior and their scholastic performance. A comparison with a control group of gifted students who did not receive the intervention was not reported.

To our knowledge, there are only two studies on SRL training conducted in regular classroom contexts, in which effects for students with above-average intelligence (Stoeger & Ziegler, 2010) and highly intelligent underachievers (Stoeger & Ziegler, 2005) were reported. In both studies, the SRL training was integrated into fourth-grade mathematics instruction at regular elementary schools and led by the students' regular classroom teachers who had received extensive training before implementing the program. All students in the participating classrooms received seven weeks of daily SRL and math training, while students in control classrooms received regular mathematics instruction. To examine the possibility that the training program had differential effects on students of different cognitive abilities, Stoeger and Ziegler (2010) divided the participating students into four subgroups (quartiles) on the basis of their intelligence test scores; thus, with the top 25% most intelligent students in this group, the group of students with above-average intelligence was relatively broad. The authors concluded that – in comparison to a control group – students benefited from the program irrespective of their cognitive ability level in terms of homework behavior, motivational variables and math performance. Stoeger and Ziegler (2005) showed furthermore that gifted underachievers (defined as students with an intelligence test score of at least 130 and z-standardized math grades one standard deviation below their z-standardized intelligence test score) who were trained in regular classrooms benefited from the training program compared to a control group of gifted underachiever who received regular classroom instruction.

Summing up, existing studies suggest that highly intelligent and high-achieving elementary school students can benefit from SRL programs as much as their peers. However, we only know of one study in which the effects of SRL training conducted in a regular classroom context were analyzed for students with above-average intelligence