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Successful learning: balancing self-regulation with instructional planning

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ABSTRACT

Many recent studies have stressed the importance of teacher candidates' (TCs) self-regulated learning (SRL) skills for successful learning. Because of the promising consequences of SRL for academic performance, teacher educators (TEs) are encouraged to increase TCs' SRL opportunities in educational programs. Because of the difficulty and complexity for TEs to successfully guide TCs towards SRL, the present study contributes to the discussion how to best facilitate TEs in finding a balance between student- and teacher-control. For this purpose, a conceptual model is presented. The model draws upon literature related to the perspective of the learner, the teacher and the learning task. Besides the context of teacher education, the model is beneficial for higher education as well as teaching and teacher professionalization. It will help instructors provide a more balanced approach between teacher- and student-controlled learning, and support students develop essential SRL skills.

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1. Introduction

In the field of cognitive psychology, social constructivist learning theories have been regarded as an important paradigm for decades (Loyens 2007). These theories acknowledge the benefits for learners to be actively engaged in constructing their own understanding (Power 2016). One of the shared assumptions of social constructivist learning theories is the significance of self-regulated learning (SRL) as the key component for successful learning in school and beyond (Boekaerts 1999; Zimmerman 2001). In general, SRL is defined as 'an active, constructive process whereby learners set goals for their learning and then attempt to monitor, regulate, and control their cognitions, motivation, and behavior, guided and constrained by their goals and the contextual features in the environment' (Pintrich 2000, 453).

From a social constructivist point of view, much empirical evidence shows that SRL is of great value for students' academic success (e.g. Hmelo-Silver, Duncan, and Chinn 2007; Simons, Van der Linden, and Duffy 2000). Advocates of the SRL approach have

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generated a generally agreed upon picture of the 'ideal learner', who likely is self-regulating. Due to these research findings in favor of SRL, it is emphasized to develop students' SRL opportunities to influence their involvement with learning and, consequently, academic performance (Eccles and Wigfield 2002; Pintrich 2000, 2004). As a consequence, in recent years, SRL is gaining attention in teacher education programs and teacher educators (TEs) are urged to equip teacher candidates (TCs) with learning skills to become adaptive learners and employees (Lunenberg and Korthagen 2003). For this aim, TEs must facilitate, support, monitor and evaluate TCs' interaction with the subject matter (i.e. learning-oriented or student-controlled) and focus less on merely transmitting subject matter knowledge (i.e. content-oriented or teacher-controlled). In other words, TEs are obliged to demonstrate a student-controlled approach and give attention to what students do in order to learn contrary to what instructors do in order to teach (Degago and Kaino 2015). To do so, TEs must become coaches in TCs' development as learners, preparing them for lifelong learning (Gallego-Arrufat and Gutiérrez-Santiuste 2015; Oosterheert 2001). However, TCs can only flourish as successful learners with sufficient guidance from TEs, avoiding a 'laissez-faire' approach (Bolhuis and Voeten 2001; Taks 2003). TEs must exert enough control on TCs' learning processes and guide TCs through the curriculum in small steps to enable them to achieve adequate academic results (Brophy and Good 1986; Eshel and Kohavi 2003; Kirschner, Sweller, and Clark 2006; Stijnen 2003; Vrieling 2012). Grounded on this more teacher-controlled point of view, Van der Werf (Wubbels et al. 2006) concludes that the empirical findings of educational research do not allow for extensive implementation of SRL.

It seems as if research has created a paradox between teacher-controlled and student-controlled dimensions of learning (Vrieling 2012). In our view, instead of describing them as contradictory phenomena, teacher-controlled and student-controlled learning should rather be seen as dimensions of a learning continuum on which diverse positions are possible. However, there is no common research opinion about the factors that must be considered to achieve such a balance between teacher- and student-controlled learning in learning environments (Vrieling 2012) and TEs often find it difficult to actually foster SRL in educational programs (Korthagen et al. 2000). Many practising TEs have not been prepared for this changing role during their own education and are often worried about their decreasing role as knowledge providers (Kremer-Hayon and Tillema 1999). So, the professional development of TEs deserves more attention to successfully implement SRL in educational programs.

In response to this problem, the focus of this article is on creating the optimal conditions for students' SRL development in higher education. It concerns an explication of teaching behaviors that are expected in SRL learning designs and represents a way of teaching that facilitates students' use of SRL skills. Through the connection of theoretical and empirical findings of five earlier performed studies in primary teacher education (Vrieling, Bastiaens, and Stijnen 2010, 2012a, 2012b, 2012c, 2013), a conceptual model is described first (Section 2) that comprises necessary ingredients for effective learning environments with balanced student- and teacher-control (i.e. 'SRL balance'). The model also visualizes the relatedness of such learning conditions with TCs' motivation for learning, their use of metacognitive skills and academic performance (Section 2.2; about the learner). Grounded on the indicators of the model, the learned lessons from

the performed studies are outlined, resulting in concrete TE advises as described and illustrated with a vignette in sections 3 (about the teacher) and 4 (about the learning task). This is followed by the discussion in section 5.

Although the model is empirically grounded on previous research in the particular area of teacher education and the research is used to make the case about teacher educators, the theoretical concepts of SRL are potentially transcending this context. This means that the findings of the research as summarized in our model, are beneficial for the context of higher education in general (e.g. support students develop essential self-study skills) as well as the broader range of teaching and teacher professionalization.

2. Towards a model for successful SRL balance

2.1. Conceptual study

Recent models of SRL include motivational beliefs or attitudes together with cognitive and metacognitive learning strategies (Wolters 2003). Pintrich (2000, 2004), for example, demonstrates motivation as a key factor of SRL that is infused throughout all phases. Similar to many models of SRL, but particularly Pintrich's (2000, 2004), we propose four phases of SRL and four areas for regulation. The four phases include (1) forethought, planning and activation, (2) monitoring, (3) control, and (4) reaction and reflection. The four areas for regulation include (a) cognition (e.g. knowledge activation, knowledge of strategies), (b) motivation and affect (e.g. achievement goals, achievement attributions, self-efficacy), (c) behavior (e.g. time, effort), and (d) context (resources, social context). For example, self-regulated learners show more self-efficacy for learning than students with poorer SRL skills; the former believe that they can use their SRL skills to help them learn (Zimmerman 2000). In such approaches of SRL, the cognitions, motivations and learning of individuals cannot be comprehended unless social and cultural context, such as support from teachers and feedback from peers, are taken into consideration (Järvelä, Järvenoja, and Veermans 2008).

Figure 1 visualizes the synthesis of the conceptual study. The findings as represented in the model are grounded on five studies of Vrieling et al. in primary teacher education, containing a review study (2010), an instrumental development study (2013), two empirical studies that searched for dynamics of TCs' use of metacognitive learning strategies and motivation for learning in learning environments with increased SRL opportunities (2012a, 2012b) and a study concerning the importance of learning networks for TEs' professional development (2012c). Figure 1 shows that academic performance of the learner is influenced by three perspectives: the learner itself, the teacher and the learning task. The three perspectives are positively related as represented by the arrows and although the three perspectives are closely connected and influence one another, we describe them from the separate perspectives. From the right to the left side of the model, the constructs are explained from the perspective of the learner in section 2.2 (metacognition, motivation and academic performance), from the perspective of the teacher in section 3 (knowledge building, scaffolding and modeling), and from the perspective of the learning task (planning, monitoring, prior knowledge activation, coaching/judging and collaboration) in section 4.

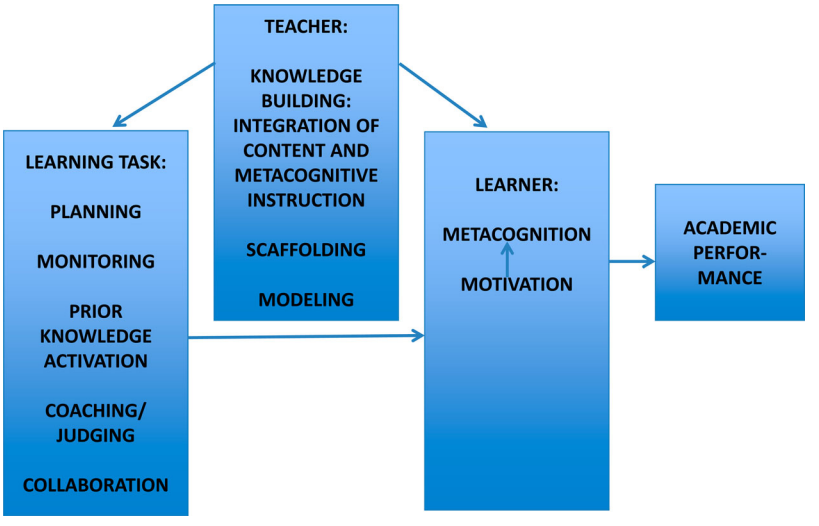

Figure 1. SRL model: Balancing self-regulation with instructional planning.

2.2. The learner: metacognition, motivation and academic performance

Because it is of value for TEs to be aware of the consequences of implementing SRL for the learner while striving for SRL balance, the constructs of metacognition, motivation and academic performance are first elaborated.

Several researchers demonstrate that metacognition (e.g. Pintrich and De Groot 1990; Vermunt and Verloop 1999; Zimmerman and Pons 1988) and motivation (e.g. Bruinsma 2004; Pintrich 2000, 2004) are positively related to academic performance. Metacognition can be defined as the knowledge about and the regulation of one's cognitive activities in learning processes (Veenman, Van Hout-Wolters, and Afflerbach 2006). It represents 'the awareness learners have about their general academic strengths and weaknesses, cognitive resources they can apply to meet the demands of particular tasks, and their knowledge about how to regulate engagement in tasks to optimize learning processes and outcomes' (Winne and Perry 2000, 533). Such active and self-regulated strategy use is found positively related to achievement (e.g. DiFransceska, Nietfeld, and Cao 2016; Pintrich and De Groot 1990; Zimmerman and Pons 1988). The use of metacognitive skills enables students to become aware of and monitor their progress towards their goals. In this way, they can improve their learning and comprehension. As a result, students can realize any adaptive changes in their learning (Vermunt and Verloop 1999).

Some theorists view SRL as a subordinate component of metacognition whereas others regard SRL as super-ordinate to metacognition (Veenman, Van Hout-Wolters, and Afflerbach 2006). In line with Muis and Franco (2010), the empirical studies of Vrieling, Bastiaens, and Stijnen (2012a, 2012b) explored metacogniton from a regulation of cognition perspective (see Section 2.1), situated as a subordinate to SRL. The empirical studies of Vrieling, Bastiaens, and Stijnen (2012a, 2012b) were conducted in educational theory courses containing lectures, lessons and moments of guidance. A mixed methods pre- and post-test design was applied in authentic teacher education class settings. In total, 14 TEs and 393 first- and second-year TCs of seven primary teacher education

institutes in the Netherlands participated. During one semester, TEs participated in training courses and tutorial conversations aimed at increasing TCs' SRL opportunities in the learning program. TCs motivation for learning as well as their use of metacognitive learning strategies were measured with the 'Motivation and Metacognition Questionnaire' (MMQ; Vrieling, Bastiaens, and Stijnen 2012a, 2012b). The MMQ contains 51 items scored on a five-point Likert scale. For the development of the MMQ, the 'Motivated Strategies for Learning Questionnaire' (MSLQ, Pintrich et al. 1991) was used as a starting point. For the metacognition part, two scales were distinguished: study process (Cronbach's α = .76; sample item: 'When I study for this course, I reflect on questions to keep my mind on the job') and study content (Cronbach's α = .82; sample item: 'Besides the content of the examination, I also study extra-literature related to the course'). TCs' use of metacognitive learning strategies increased significantly during one semester in learning environments with increased SRL opportunities. Hence, TEs play a major role in developing TCs' use of metacognitive learning strategies by increasing TCs' SRL opportunities in learning environments.

Motivation can be seen as either a product or a process (Wolters 2003). When viewed as a product, students have a level of motivation that they experience and that influences their choice, effort and persistence regarding a particular activity. When viewed as a process, motivation refers not just to an end state but also to the means through which that state is determined. In other words, motivational tendencies change during learning in classroom practice (Järvelä, Järvenoja, and Veermans 2008) and students can learn to regulate their motivational state (Wolters 2003).

The empirical studies of Vrieling, Bastiaens, and Stijnen (2012a, 2012b) viewed motivation from the process perspective. TCs were followed with the the motivation section of the MMQ comprising seven scales: intrinsic goal orientation (Cronbach's α = .73; sample item: 'During this course, I prefer challenging subject material so I can learn new things'), extrinsic goal orientation (Cronbach's α = .77; sample item: 'I want to do better than the average student'), intrinsic goal avoidance (Cronbach's α = .81; sample item: 'I worry about not getting the full benefit out of this course'), extrinsic goal avoidance (Cronbach's α = .72; sample item: 'I only want to avoid doing poorly for this course'), task value (Cronbach's α = .74; sample item: 'I think the course material in this class is useful for me to learn'), expectancy (Cronbach's α = .90; sample item: 'I think that I will get good grades for this course ') and test anxiety (Cronbach's α = .89; sample item: 'I suffer from nerves when I take an exam').

Although TCs' motivation for learning correlated significantly positive with SRL opportunities in the empirical studies and the level of SRL opportunities was shown a significant positive predictor of the motivation score, the increase of TCs' motivation for learning appeared not significant during the research period of one semester. If TCs have ideas about and preferences for learning and teaching that are contrary to appreciating process-oriented learning, it is not likely they will engage in SRL activities (Loyens 2007). Also, learners are not always motivated to invest much time and energy in developing adequate learning skills (Van Hout-Wolters, Simons, and Volet 2000). Hence, although important for learning, SRL imposes a substantial burden on TCs and asks for a high responsibility of learners. Therefore, increasing TCs' SLR opportunities does not automatically result in a different attitude towards learning. Contrary to these findings was shown that TCs' expectancy, a component within the motivation scale, increased

significantly. The expectancy scale includes control belief and self-efficacy for learning and performance, e.g. 'I believe I will receive an excellent grade in this class'. In short, TCs appreciated the SRL increase and felt more confident towards the transfer from theory to classroom practice, the assignments and the final test.

Finally, although to a minor extent, the correlation between TCs' use of metacognitive learning strategies and their motivation for learning was shown positively significant in the studies of Vrieling, Bastiaens, and Stijnen (2012a, 2012b). These results are in line with earlier research findings indicating that student motivation and use of learning strategies are related (Bruinsma 2004; Eccles and Wigfield 2002; Pintrich 2000, 2004; Pintrich and De Groot 1990). In addition, Berger and Karabenick (2011) found evidence for the relatedness between student' motivation and use of learning strategies in a unidirectional matter: motivation predicts the use of metacognitive learning strategies, but the use of metacognitive learning strategies does not predict the motivation for learning. In other words, more motivated students are more likely to use cognitive and metacognitive strategies and are more effective in their effort regulation.

3. The teacher: knowledge building, scaffolding and modeling

3.1. Knowledge building

In a systematic review study concerning SRL, Vrieling, Bastiaens, and Stijnen (2010) point out the importance to create a sufficient knowledge base for TCs in the domain (subject area) while increasing their SRL opportunities in educational programs. TEs are experts in the domain, and it is their task to make it more accessible to TCs (Bolhuis and Voeten 2001).

When learning is conceived as self-regulated knowledge construction, the role of TEs evolves to supporting and guiding TCs' SRL (Vermunt and Verloop 1999). In these learning conditions, it is important for TEs to integrate teaching of domain-specific content knowledge on the one hand and metacognitive learning and thinking strategies on the other (Vermunt and Vermetten 2004; Vermunt and Verschaffel 2000). For that reason, TEs are advised to create opportunities for TCs to practice the necessary metacognitive skills. To develop TCs' metacognitive learning skills, TEs must explicitly link that skill development to the way they teach. This means that the teaching procedures challenge TCs' thinking and their thinking about thinking. In short, integrated with content knowledge, TCs benefit most from explicit metacognitive strategy instructions.

Altogether, the model visualizes the necessity for TEs to create a sufficient knowledge base for TCs in the domain. Integrating the necessary metacognitive skills and content matter during instruction must facilitate this knowledge building. Only then, increased SRL opportunities for TCs can result in more motivated TCs and increased use of metacognitive skills. Contrary to the importance of linking content with metacognition in courses, in the Netherlands many educational programs in primary teacher education display a gap concerning SRL opportunities between the major (first two years, mainly teacher-controlled) and minor (final two years, mainly student-controlled) phase of learning programs (Vrieling, Bastiaens, and Stijnen 2012b).

To illustrate how content matter can be covered, we exemplarily describe the experiences of a primary TE (Anne), teaching educational theory courses. In one of her semester courses (5 months), she teaches 10 lessons to fulltime second-year regular TCs. In general, Anne wishes to diminish the consuming role of TCs that she frequently observes in her lessons. Therefore, at the end of lesson 2, Anne divides the theory of her course in 8 subjects and provides opportunities for TCs to select one of the topics that interest them. Then, the TCs work in groups on their subjects in the lessons 3 till 6 and are subsequently asked to present their work in the lessons 7 till 9. In the final lesson, TCs can ask questions. In addition, Anne creates a digital learning environment to combine both face-to-face learning in classroom settings as well as distance learning in online learning environments. In order to integrate the course content with the explicit practice of metacognitive skills, Anne's TCs are obliged to make a working plan, follow their progress towards the presentations and provide peer feedback in the lessons 7 till 9. Important principles for TEs to guide this process and to ensure successful knowledge building are provided in sections 3.2 (scaffolding) and 3.3 (modeling).

3.2. Scaffolding

Successful knowledge building is only established by a gradual development from teacher control to student control over learning processes, also known as scaffolding. The metaphor of scaffolding is originally based on Vygotsky's zone of proximal development, referring to 'the notion that developing mental functions must be fostered and assessed through collaborative activities in which learners participate in constructive tasks of problem solving with the assistance of more knowledgeable others' (Windschitl 2002, 141). In an optimally scaffolded instruction, teachers gradually decrease assistance when the students are able to perform more independently (Salonen, Vauras, and Efklides 2005). Kirschner, Sweller, and Clark (2006) also emphasize the importance for students to possess sufficient prior knowledge (see Section 4.3) to be able to internally guide themselves. Only then can the guidance of the teacher decrease.

In accordance with these results, Salonen, Vauras, and Efklides (2005) report about 'scaffold mismatches' in their research, meaning that mismatches occur between the learners' needs and the guidance of the teacher. In their study of metacognition it was shown that students' judgments of their own metacognitive experiences are more closely related to their performance than the judgments of peers or teachers. Peers' and teachers' judgments are presumably driven by normative criteria of performance or by theory- or belief-driven views about ability.

As for a gradual development of metacognitive skills, in all lessons Anne provides the 'big picture' of the course, however zooming in on the explicit expectations ('just in time information') of TCs in the relevant phase of the learning process. Within that structure, Anne's TCs are asked to make a working plan (planning, see Section 4.1), follow their progress towards the presentations (monitoring, see Section 4.2) and provide peer feedback (coaching/judging, see Section 4.4). According to Anne, these demands fit TCs' earlier metacognitive experiences. To support TCs' metacognitive growth, Anne provides a description of the assignment, a working plan format to structure the assignment, opportunities for two feedback moments, criteria for judging the presentations and a best practice with general feedback examples. In addition, the online learning environment contains audio fragments with previous TC experiences concerning the course content, difficulties and the way to overcome them, learning outcomes and successful experiences. To not over ask her TCs, Anne judges the presentations and also organizes a final 10th lesson where TCs receive opportunities to ask questions about uncertainties in the topics to better prepare them for the final test.

3.3. Modeling

Grounded on the findings of the empirical studies of Vrieling, Bastiaens, and Stijnen (2012a, 2012b), it can be concluded that TEs can play a major role in developing TCs'

use of metacognitive learning strategies by increasing TCs' SRL opportunities in educational programs. So, in alignment with the findings of several researchers (e.g. DiFranscesska, Nietfeld, and Cao 2016; Power 2016; Riding and Al-Sanabani 1998), it is possible for TCs to develop metacognitive learning strategies to cope with situations for which the individual's style is not naturally appropriate. However, explicit training of metacognitive learning strategies was shown rare in primary TCs' classrooms (Vrieling, Bastiaens, and Stijnen 2012a, 2012b). These findings are in line with the results of Kistner et al. (2010) who also conclude that a great amount of strategy teaching occurs in an implicit way because TEs often find it difficult to serve as a role model. TEs are absolutely willing to invest effort in the instruction of metacognition within their lessons, but they need the 'tools' for implementing metacognition as an integral part of their lessons and for making TCs aware of their metacognitive activities and the usefulness of those activities (Veenman, Van Hout-Wolters, and Afflerbach 2006).

Therefore, teachers in higher education are advised to incorporate a more structured and rigorous approach in their training and fostering of TCs' metacognitive knowledge and learning strategies in education and training (Power 2016). Hattie (2009) also emphasizes the importance for teachers to support students to develop a series of learning strategies that enables them to construct their own learning. The teaching of these strategies needs to be planned, deliberate and explicit, and part of active programs to teach specific skills and deeper understanding. Anne's TCs, for example, are required to provide feedback to peers during working on their assignments. However, providing effective feedback is a complex metacognitive skill (Hattie and Timperley 2007; Westberry and Franken 2015), because feedback needs to be clear, purposeful, meaningful, and compatible with TCs' prior knowledge to provide logical connections. Furthermore, it needs to encourage TCs' active information processing, have low task complexity, relate to specific and clear goals, and provide little threat to TCs' feelings of self-efficacy.

Because of the complexity of feedback, it is questionable whether higher education students can effectively support their peers in absence of the teacher (Westberry and Franken 2015). Despite the complexity of this metacognitive skill, most TCs have not been taught how to perform such a metacognitive skill (Vrieling 2012). Through modeling, TEs can make their teaching more explicit (Lunenberg, Korthagen, and Swennen 2007). To do this, the necessary metacognitive skill, feedback in this case, can be modeled upon four regulatory skill levels (Schunk and Zimmerman 2007). At the first level (observation), TCs can induce the major features of the skill from watching someone model learning or performing. At the second level (emulation), the TC, with assistance from the group, imitates the model's performance. At the third level (self-control), the learner independently performs under structured conditions. At the final level (self-regulation), TCs shows an adaptive use of skills across changing personal and environmental conditions. In practice, TEs often expect TCs to self-control a certain metacognitive skill like (peer) feedback after observing the skill, in this way skipping the important emulation phase (Vrieling 2012). Being aware of the necessity of going through the four modeling phases is important to develop a gradual requirement of the specific skill.

In addition, the metacognitive instruction of underachieving TCs needs to vary between TCs suffering from an availability deficiency and TCs with a production deficiency of metacognition (Veenman, Van Hout-Wolters, and Afflerbach 2006). The first group does not have sufficient metacognitive knowledge and skills at their disposition and

needs metacognitive instruction from the beginning. For this group of TCs, it is important to provide additional learning opportunities to practice metacognitive skills. The latter group has a certain level of metacognitive knowledge and skills at their disposition, but fail to use their metacognition due to task difficulty, test anxiety, lack of motivation, or their inability to see the appropriateness of metacognition in a particular situation. Their instruction can be limited to guiding metacognitive activity during task performance.

In the case of Anne, at the observation level, feedback practices are demonstrated through, for example, written examples, life or video performances. All artefacts can also be observed in the online learning environment. In this way, TCs obtain more flexible and individual opportunities for SRL, important to better connect to their prior knowledge level (see Section 4.3). At the emulation level, TCs practice the skill in a structured learning environment such as the classroom where guidance is provided. To support the metacognitive process, Anne provides criteria for peer feedback (e.g. 'concrete formulation of the research questions'). At the self-control level TCs practice metacognitive skills as a part of their assignments, still being observed by the TE from a distance. Again the online learning environment can be of assistance. Based on her observations of critical factors in the learning process, Anne provides general feedback relevant for all TCs. Also, several subjects initiated by Anne as well as TCs are discussed in the online environment. In this way, Anne guides her TCs more intensively during learning. At the self-regulation level, Anne's TCs ask for and provide (peer) feedback in learning processes in a self-regulating matter.

4. The learning task

The model also points out the importance for TEs to pay attention to the relevant SRL aspects of learning tasks (i.e. assignments TCs must accomplish) because the level of SRL opportunities in pre-service teacher learning tasks was shown a moderate predictor of TCs' use of metacognitive learning strategies and motivation for learning. The learning task distinguishes the following sub-constructs: planning, monitoring, prior knowledge activation, coaching/judging and collaboration.

4.1. Planning

In the planning phase it is important for TCs to learn how to set goals. Academic goals are regarded as important variables for TCs because goals can serve as self-defining reference points that determine the further processes of SRL, such as planning, executing and monitoring (Schunk and Ertmer 2000). A second SRL aspect for planning concerns metacognitive knowledge activation that includes the activation of knowledge about cognitive tasks and cognitive strategies (Pintrich 2000, 2004). A third important SRL component of planning concerns task value activation, referring to the activation of perceptions of the relevance, utility and importance of the task (Pintrich 2000). Finally, time management is an important component of planning as well (Dembo and Eaton 2000). This aspect involves making schedules for studying and allocating time for different activities.

For the 'planning' construct, Anne divides the assignment of her course into smaller parts ('metacognitive knowledge activation') and describes the value of the assignment towards classroom practice ('task value activation'). She also scaffolds the working plan through the formulation of learning goals for her course ('goal setting') on forehand. Within these boundaries, TCs are asked to describe which learning activities they plan to attend to master the learning goals for Anne's course. To concretize their formulation, TCs must formulate their learning activities SMART (specific, measurable, acceptable, realistic and time processing). TCs are also asked to make a time plan to master the learning goals for the course.

4.2. Monitoring

Monitoring includes metacognitive awareness and monitoring of cognition and represents a core component within information processing models of self-regulation (e.g. Nietfeld, Cao, and Osborne 2006). It is important for TCs to develop thinking activities to decide on learning contexts, to exert control over their processing and affective activities and to steer the course and outcomes of their learning (Vermunt and Verloop 1999). Effective self-regulated learners generate internal feedback as they monitor their engagement with learning activities and tasks and assess progress towards goals (Butler and Winne 1995). During this self-evaluation, students compare self-observed performance to an absolute standard or prior performance (Zimmerman 2002).

For the purpose of monitoring, Anne's TCs must describe their progress for the course in their working plan, based on the previously formulated criteria as mentioned in Section 3.2. TCs must also point out in which areas they need feedback and, after having received feedback, they must describe the adjustments of their work. In this way, Anne encourages her TCs to monitor their strong and weak experiences and act upon them.

4.3. Prior knowledge activation

Prior knowledge activation enables TCs to understand the task and its goals, to recognize the required knowledge for performing it and to distinguish the several characteristics and their prediction of performance (Eilam and Aharon 2003). In this way, prior knowledge facilitates individuals to monitor, behave accordingly, judge results in relation to goals and construct more appropriate conditional knowledge for better performance in the future (Butler and Winne 1995). Prior knowledge activation also supports TCs to formulate challenging goals, an important ingredient for SRL (e.g. Dembo and Eaton 2000; Eccles and Wigfield 2002; Schunk and Ertmer 2000; Zimmerman 2007).

Through dividing the theory of her course in 8 subjects and providing opportunities to select one of the topics that interest them, the content of Anne's lessons as well as the assignment better appeal to TCs' prior knowledge. In the online learning environment, TCs receive additional opportunities to read, listen and view course material in their own time and tempo. This material not only concerns basic artefacts relevant for all TCs (e.g. a quiz to practice the learning content) but also differentiating artefacts to challenge TCs. For example extra literature related to the course can be read under the title: 'Are you curious enough to observe?' TCs can also earn bonus points for more complicated aspects of the assignment and are asked to describe how their learning activities are challenging.

4.4. Coaching/judging

In the SRL self-reflection phase (coaching/judging), Pintrich (2000, 2004) distinguishes two cognitive key processes. The first process involves learners' judgements and evaluations of their performance of the task. For higher education students this ability to reflect effectively is considered an important twenty-first century skill (Power 2016) because it enables students to acquire new professional modes of understanding and behavior (Meijer et al. 2016). TCs can learn to make judgments about the way their work relates to the criteria. A critical intervention for developing TCs' SRL within this cognitive process concerns external feedback (Nicol and Macfarlane-Dick 2006). Effective

self-regulated learners actively interpret external feedback, for example from TEs, in relation to their internal goals.

For her course, Anne provides short- and long-term feedback opportunities and, in the presentation lessons, her TCs are asked to provide feedback to their peers. In both cases, the feedback is based on previously formulated criteria as provided by Anne. To scaffold the SRL process, the presentations are discussed and judged by Anne, also based on the criteria. In this way, Anne aims to balance between student- and teacher-control, to avoid TCs' uncertainty and to develop their expectancy for learning.

The second process of the SRL self-reflection phase concerns TCs' attributions for performance. Attributions are beliefs concerning the causes of outcomes (Butler 2002). TEs can facilitate effective self-regulation by providing attribution feedback to TCs that stresses the factors TCs can control, such as effort and strategy use (Schunk 2007).

In her lessons, Anne stresses TCs' strong qualities and also demonstrates that making mistakes is part of the learning process. Because Anne scaffolds her course via the big picture towards the specific learning phase (introducing, deepening, incorporating, testing) and vice versa, she can increase TCs expectancy: 'Do not worry, we are still in the introduction phase, so focus on finding a collaboration partner, getting a first impression of the working plan and thinking about research questions that are relevant for your group'.

4.5. Collaboration

Finally, student collaboration plays a facilitative role in developing SRL (Wigfield, Hoa, and Klauda 2007). When TCs have collaborative projects to complete, they make special effort to ensure their contribution to the group. Also, encouraging TCs to consult with peers can lead to making the most of their classmates as knowledge resources. For that reason, learning processes and results should be regarded as social phenomena (Bolhuis and Voeten 2001). To facilitate TCs' reasoning and to sustain their interest and engagement, TEs have to guide peer interactions (Norton and Hathaway 2010) by insuring positive interdependence in the group, giving clear instructions on how to co-operate and providing adequate feedback on the co-operating process (Bolhuis and Voeten 2001). In addition, the transaction costs (communication and coordination within the group) should be kept to a minimum to ensure positive interdependence (Kirschner, Paas, and Kirschner 2009).

In the case of Anne, TCs appreciate the discussion, argumentation, and reflection upon the group task at hand because deeper processing of the information and richer and more meaningful learning is achieved. Nevertheless, TCs also stress the importance for all individual members of the group to actively cooperate. When this is not the case, the advantages of the joined effort are decreased and TCs give privilege to working alone. To follow TCs' interactions, one of the criteria of Anne's assignment is for TCs to describe the way they collaborate with peers for her course. In the collaboration process attention is paid to general social and communication skills such as good listening and respecting each other's opinions as well as specific collaboration skills such as dividing tasks and reporting to each other.

5. Discussion

TEs are increasingly confronted with the necessity to incorporate SRL in their professional standard. Therefore, the question of how to achieve learning environments with balanced student- and teacher-control is important for educational researchers, practitioners and

policy makers. The large majority of the elements incorporated in this conceptual study address issues or areas that have received significant research attention over a long time span. By presenting them in a clarifying conceptual model, more insight into relevant SRL aspects is provided. Moreover, the indicators of the model present implications for SRL to consider in designing educational programs. In this way, the model can support TEs in designing, guiding and evaluating learning environments with balanced student- and teacher-control.

As demonstrated in the model (Figure 1), TEs are advised to create a sufficient knowledge base for their TCs. To do this, TEs should integrate the necessary metacognitive skills and content matter into their teaching and gradually transfer the control of the learning processes from teacher to student (scaffolding). To facilitate the scaffolding process, TCs' use of metacognitive skills should be modeled upon the following four regulatory skills levels: observation, emulation, self-control and self-regulation. TEs should also consider relevant aspects of the learning task: planning (including goal setting, metacognitive knowledge activation, task value activation, and time management), monitoring, prior knowledge activation, coaching/judging (including metacognitive awareness and monitoring of cognition, judgments, and attributions) and collaboration. Under the ideal circumstances of balanced student- and teacher-control, TCs use of metacognitive learning strategies and their motivation for learning is developed, both important for their academic performance.

This conceptual study aimed at finding the ideal learning environment that does not distinguish between student- and teacher-controlled dimensions of learning, but adapts its instruction based on the needs of the students in specific learning situations. Effective SRL balance asks for a thorough preparation. TEs have to think about ways to provoke and support goal setting, planning, monitoring, control and reflection by TCs themselves. Maybe, the increase of TCs' SRL opportunities in learning programs even demands more effort and attention of TEs than the regular approach.

Overall, a combination of student- and teacher-controlled learning (i.e. 'SRL balance') is effective for TCs' development. Facilitation principles are provided for instructional SRL designs with scaffolded guidance by TEs (see Figure 1) that best supports TCs' learning. In learning environments where TCs' SRL opportunities gradually increase and teacher- and student-controlled dimensions of learning strengthen one another, successful academic development of TCs is developed. In this way, a first step towards a successful balance between student- and teacher-controlled dimensions of learning is established.

It is evident to consider the outreach of the presented model. Although the model draws upon empirical studies focusing on the dynamics between TEs and TCs, the conceptual notions stem from an extensive international review study concerning SRL and higher education in general. Therefore, the model is transferable to other higher education programs and professions as well. However, courses in higher education exist within a larger system of practices and norms. As a consequence, successful implementation of the model within higher education courses requires a certain context or surrounding conditional factors (Vrieling, Bastiaens, and Stijnen 2010). In accordance with the proposed model, this implementation requires attention to the three central perspectives of the model: the teacher, the learner, and the learning task.

First, in accordance with the findings of Degago and Kaino (2015), an adequate preparation of teachers is essential. The effective integration of SRL in educational programs

requires teachers who understand and are convinced of the educational value of SRL. Teachers must also possess the necessary knowledge and skills to implement SRL.

Second, the comprehension of the significance of SRL by students must be considered. Students may have ideas about and preferences for learning and teaching that are contrary to appreciating SRL. Also, students are not always motivated to invest much time and energy in developing adequate learning skills.

Third, the use of adequate learning materials for SRL are required. For example, classrooms that do not allow for individual or group work can threaten smooth implementation. Finally, the school context and culture may be obstacles. Fluent implementation can be impeded by a lack of time, large group sizes, applying a school evaluation system that neglects SRL, etc.

Besides the transferability of the model towards higher education programs and professions, the model has proven its value beyond the context of its development. It is applicable in formal teaching settings, yet we also apply the model within informal learning settings like networked learning that receives increased attention in education.

Regarding the empirical positive effects from SRL implementation towards students' motivation, metacognition and academic performance, the validity of the model requires further research in other (higher) educational settings. The intervention studies that provided the empirical research claims were carried out in one-semester teacher education programs. To provide more insight into the way students develop as self-regulated learners, future research would benefit from monitoring them over a longer period of time.

To conclude, many TEs have difficulty in implementing SRL in their educational programs. The conceptual model as presented in this article can be of guidance in endorsing the professional development of teachers in their search for SRL implementation in educational curricula. The model discusses important SRL characteristics to consider while increasing TCs' SRL opportunities in higher educational programs. In this way, the model can facilitate TEs in finding a balance between self-regulation and instructional planning, important for successful learning in the twenty-first century.

Disclosure statement

No potential conflict of interest was reported by the authors.

References

Berger, J.-L., and S. A. Karabenick. 2011. "Motivation and Students' Use of Learning Strategies: Evidence of Unidirectional Effects in Mathematics Classrooms." *Learning and Instruction* 21 (3): 416–428.

Boekaerts, M. 1999. "Self-regulated Learning: Where We Are Today." *International Journal of Educational Research* 31 (6): 445–457.

Bolhuis, S., and M. J. M. Voeten. 2001. "Toward Self-directed Learning in Secondary Schools: What Do Teachers Do?" *Teaching and Teacher Education* 17 (7): 837–855.

Brophy, J., and T. L. Good. 1986. "Teacher Behaviour and Student Achievement." In *Handbook of Research on Teaching*, edited by M. C. Wittrock, 328–375. London: Collier Macmillan Publishers.

Bruinsma, M. 2004. "Motivation, Cognitive Processing and Achievement in Higher Education." *Learning and Instruction* 14 (6): 549–568.

Butler, D. L. 2002. "Individualizing Instruction in Self-regulated Learning." *Theory into Practice* 41 (2): 81–92.

Butler, D. L., and P. H. Winne. 1995. "Feedback and Self-regulated Learning: A Theoretical Synthesis." *Review of Educational Research* 65 (3): 245–281.
Degago, A. T., and L. M. Kaino. 2015. "Towards Student-centred Conceptions of Teaching: The Case of Four Ethiopian Universities." *Teaching in Higher Education* 20 (5): 493–505.
Dembo, M. H., and M. J. Eaton. 2000. "Self-regulation of Academic Learning in Middle-level Schools." *The Elementary School Journal* 100 (5): 473–490.
DiFransceska, D., J. L. Nietfeld, and L. Cao. 2016. "A Comparison of High and Low Achieving Students on Self-regulated Learning Variables." *Learning and Individual Differences* 45: 228–236.
Eccles, J. S., and A. Wigfield. 2002. "Motivational Beliefs, Values, and Goals." *Annual Review of Psychology* 53 (1): 109–132.
Eilam, B., and I. Aharon. 2003. "Students' Planning in the Process of Self-regulated Learning." *Contemporary Educational Psychology* 28 (3): 304–334.
Eshel, Y., and R. Kohavi. 2003. "Perceived Classroom Control, Self-regulated Learning Strategies, and Academic Achievement." *Educational Psychology* 23 (3): 249–260.
Gallego-Arrufat, M.-J., and E. Gutiérrez-Santiuste. 2015. "Perception of Democracy in Computer-mediated Communication: Participation, Responsibility, Collaboration, and Reflection." *Teaching in Higher Education* 20 (1): 92–106.
Hattie, J. 2009. *Visible Learning: A Synthesis of Over 800 Meta-analyses Relating to Achievement*. London: Routledge.
Hattie, J., and H. Timperley. 2007. "The Power of Feedback." *Review of Educational Research* 77 (1): 81–112.
Hmelo-Silver, C. E., R. G. Duncan, and C. A. Chinn. 2007. "Scaffolding and Achievement in Problem-based and Inquiry Learning: A Response to Kirschner, Sweller, and Clark (2006)." *Educational Psychologist* 42 (2): 99–107.
Järvelä, S., H. B. Järvenoja, and M. Veermans. 2008. "Understanding the Dynamics of Motivation in Socially Shared Learning." *International Journal of Educational Research* 47 (2): 122–135.
Kirschner, F., F. Paas, and P. A. Kirschner. 2009. "A Cognitive Load Approach to Collaborative Learning: United Brains for Complex Tasks." *Educational Psychology Review* 21 (1): 31–42.
Kirschner, P. A., J. Sweller, and R. E. Clark. 2006. "Why Minimal Guidance During Instruction Does Not Work: An Analysis of the Failure of Constructivist, Discovery, Problem-based, Experiential, and Inquiry-based Teaching." *Educational Psychologist* 41 (2): 75–86.
Kistner, S., K. Rakoczy, B. Otto, Ch. Dignath-Van Ewijk, G. Büttner, and E. Klieme. 2010. "Promotion of Self-regulated Learning in Classrooms: Investigating Frequency, Quality, and Consequences for Student Performance." *Metacognition and Learning* 5 (2): 157–171.
Korthagen, F., C. Klaassen, and T. Russell. 2000. "New Learning in Teacher Education." In *New Learning*, edited by P. R.-J. Simons, J. Van der Linden, and T. Duffy, 243–259. Dordrecht: Kluwer Academic Publishers.
Kremer-Hayon, L., and H. H. Tillema. 1999. "Self-regulated Learning in the Context of Teacher Education." *Teaching and Teacher Education* 15 (5): 507–522.
Loyens, S. 2007. "Students' Conceptions of Constructivist Learning." PhD diss., Erasmus University, the Netherlands.
Lunenberg, M., and F. A. J. Korthagen. 2003. "Teacher Educators and Student-directed Learning." *Teaching and Teacher Education* 19 (1): 29–44.
Lunenberg, M., F. Korthagen, and A. Swennen. 2007. "The Teacher Educator as a Role Model." *Teaching and Teacher Education* 23 (5): 586–601.
Meijer, M.-J., F. Geijsel, M. Kuijpers, F. Boei, and E. Vrieling. 2016. "Exploring Teachers' Inquiry-based Attitude." *Teaching in Higher Education* 21 (1): 64–78.
Muis, K. R., and G. M. Franco. 2010. "Epistemic Profiles and Metacognition: Support for the Consistency Hypothesis." *Metacognition and Learning* 5 (1): 27–45.
Nicol, D. J., and D. Macfarlane-Dick. 2006. "Formative Assessment and Self-regulated Learning: A Model and Seven Principles of Good Feedback Practice." *Studies in Higher Education* 31 (2): 199–218.

Nietfeld, J. L., L. Cao, and J. W. Osborne. 2006. "The Effect of Distributed Monitoring Exercises and Feedback on Performance, Monitoring Accuracy, and Self-efficacy." *Metacognition and Learning* 1 (2): 159–179.
Norton, P., and D. Hathaway. 2010. "Online Conversations With Peers and With Expert Mentor: Is There a Difference?" In *Research Highlights in Technology and Teacher Education 2010*, edited by C. Maddux, D. Gibson, and B. Dodge, 19–26. Chesapeake, VA: Society for Information Technology and Teacher Education.
Oosterheert, I. 2001. "How Student Teachers Learn: A Psychological Perspective on Knowledge Construction in Learning to Teach." PhD diss. Groningen University, the Netherlands.
Pintrich, P. R. 2000. "The Role of Goal Orientation in Self-regulated Learning." In *Handbook of Self-regulation*, edited by M. Boekaerts, P. R. Pintrich, and M. Zeidner, 451–502. San Diego, CA: Academic Press.
Pintrich, P. R. 2004. "A Conceptual Framework for Assessing Motivation and Self-regulated Learning in College Students." *Educational Psychology Review* 16 (4): 385–407.
Pintrich, P. R., and E. V. De Groot. 1990. "Motivational and Self-regulated Learning Components of Classroom Academic Performance." *Journal of Educational Psychology* 82 (1): 33–40.
Pintrich, P. R., D. Smith, T. Garcia, and W. J. McKeachie. 1991. *A Manual for the use of the Motivated Strategies for Learning Questionnaire (MSLQ)*. Ann Arbor: University of Michigan, School of Education.
Power, J. B. 2016. "Has This Begun to Change The Way They Think? Moving Undergraduate Learners' Level of Reflection from Where It is to Where It Needs to Be." *Teaching in Higher Education* 21 (3): 235–248.
Riding, R. J., and S. A. Al-Sanabani. 1998. "The Effect of Cognitive Style, Age, Gender and Structure on the Recall of Prose Passages." *International Journal of Educational Research* 29 (3): 173–185.
Salonen, P., M. Vauras, and A. Efklides. 2005. "Social Interaction - What Can It Tell us about Metacognition and Coregulation in Learning?" *European Psychologist* 10 (3): 199–208.
Schunk, D. H. 2007. "Attributions as Motivators of Self-regulated Learning." In *Motivation and Self-regulated Learning*, edited by D. H. Schunk, and B. J. Zimmerman, 245–266. New York, NY: Lawrence Erlbaum Associates.
Schunk, D. H., and P. A. Ertmer. 2000. "Self-regulation and Academic Learning." In *Handbook of Self-regulation*, edited by M. Boekaerts, P. R. Pintrich, and M. Zeidner, 631–649. San Diego, CA: Academic Press.
Schunk, D. H., and B. Zimmerman. 2007. "Influencing Children's Self-efficacy and Self-regulation of Reading and Writing Through Modelling." *Reading and Writing Quarterly* 23 (1): 7–25.
Simons, P. R.-J., J. Van der Linden, and T. Duffy. 2000. "New Learning: Three Ways to Learn in a New Balance." In *New Learning*, edited by P. R.-J. Simons, J. Van der Linden, and T. Duffy, 1–20. Dordrecht: Kluwer Academic Publishers.
Stijnen, P. J. J. 2003. *Leraar Worden: 'Under Construction'? Over Lerarentekorten en Afstandsonderwijs voor de Opleiding tot Leraar* [Becoming a Teacher: 'Under Construction'? About Teacher Shortages and Distance Education for Teachers]. Maastricht: Shaker Publishing BV.
Taks, M. 2003. "Zelfsturing in Leerpraktijken: Een Curriculumonderzoek naar Nieuwe Rollen van Studenten en Docenten in de Lerarenopleiding [Selfregulation in Learning Practices: A Curriculum Research Concerning New Roles of Students and Teachers in Teacher Education]." PhD diss., Twente University, the Netherlands.
Van Hout-Wolters, B., R.-J. Simons, and S. Volet. 2000. "Active Learning: Self-directive Learning and Independent Work." In *New Learning*, edited by P. R.-J. Simons, J. Van der Linden, and T. Duffy, 21–36. Dordrecht: Kluwer Academic Publishers.
Veenman, M. V. J., B. H. A. M. Van Hout-Wolters, and P. Afflerbach. 2006. "Metacognition and Learning: Conceptual and Methodological Considerations." *Metacognition and Learning* 1 (1): 3–14.
Vermunt, J. D., and N. Verloop. 1999. "Congruence and Friction between Learning and Teaching." *Learning and Instruction* 9 (3): 257–280.

Vermunt, J. D., and Y. J. Vermetten. 2004. "Patterns in Student Learning: Relationships between Learning Strategies, Conceptions of Learning, and Learning Orientations." *Educational Psychology Review* 16 (4): 359–384.
Vermunt, J. D., and L. Verschaffel. 2000. "Process-oriented Teaching." In *New Learning*, edited by P. R.-J. Simons, J. Van der Linden, and T. Duffy, 209–225. Dordrecht: Kluwer Academic Publishers.
Vrieling, E. M. 2012. "Promoting Self-regulated Learning in Primary Teacher Education." PhD diss., Open University, the Netherlands.
Vrieling, E. M., Th. J. Bastiaens, and P. J. J. Stijnen. 2010. "Process-oriented Design Principles for Promoting Self-regulated Learning in Primary Teacher Education." *International Journal of Educational Research* 49 (4-5): 141–150.
Vrieling, E. M., Th. J. Bastiaens, and P. J. J. Stijnen. 2012a. "Effects of Increased Self-regulated Learning Opportunities on Student Teachers' Motivation and Use of Metacognitive Skills." *Australian Journal of Teacher Education* 37 (8): 102–117.
Vrieling, E. M., Th. J. Bastiaens, and P. J. J. Stijnen. 2012b. "Effects of Increased Self-regulated Learning Opportunities on Student Teachers' Metacognitive and Motivational Development." *International Journal of Educational Research* 53: 251–263.
Vrieling, E. M., Th. J. Bastiaens, and P. J. J. Stijnen. 2012c. "Using Online Learning Networks to Promote Self-regulated Learning in Primary Teacher Education." In *Research Highlights in Technology and Teacher Education*, edited by C.D Maddux and D. Gibson, 101–109. Chesapeake, VA: Society for Information Technology and Teacher Education (SITE).
Vrieling, E. M., Th. J. Bastiaens, and P. J. J. Stijnen. 2013. "The 'Self-regulated Learning Opportunities Questionnaire': A Diagnostic Instrument for Primary Teacher Educators." *Professional Development in Education* 39 (5): 799–821.
Westberry, N., and M. Franken. 2015. "Pedagogical Distance: Explaining Misalignment in Student-driven Online Learning Activities Using Activity Theory." *Teaching in Higher Education* 20 (3): 300–312.
Wigfield, A., L. W. Hoa, and S. L. Klauda. 2007. "The Role of Achievement Values in the Regulation of Achievement Behaviours." In *Motivation and Self-regulated Learning*, edited by D. H. Schunk, and B. J. Zimmerman, 169–195. New York, NY: Lawrence Erlbaum Associates.
Windschitl, M. 2002. "Framing Constructivism in Practice as the Negotiation of Dilemmas: An Analysis of the Conceptual, Pedagogical, Cultural, and Political Challenges Facing Teachers." *Review of Educational Research* 72 (2): 131–175.
Winne, P. H., and N. E. Perry. 2000. "Measuring Self-regulated Learning." In *Handbook of Self-regulation*, edited by M. Boekaerts, P. R. Pintrich, and M. Zeidner, 531–566. San Diego, CA: Academic Press.
Wolters, C. A. 2003. "Regulation of Motivation: Evaluating an Underemphasized Aspect of Self-regulated Learning." *Educational Psychologist* 38 (4): 189–205.
Wubbels, Th, G. Van der Werf, R. J. Simons, L. Stevens, and T. De Jong. 2006. "Het nieuwe leren." *Pedagogische Studiën* 83 (1): 74–99.
Zimmerman, B. J. 2000. "Attaining Self-regulation: A Social Cognitive Perspective." In *Handbook of Self-regulation*, edited by M. Boekaerts, P. R. Pintrich, and M. Zeidner, 13–39. San Diego, CA: Academic Press.
Zimmerman, B. J. 2001. "Theories of Self-regulated Learning and Academic Achievement: An Overview and Analysis." In *Self-regulated Learning and Academic Achievement: Theoretical Perspectives*, edited by B. J. Zimmerman, and D. H. Schunk, 1–37. Mahwah, NJ: Lawrence Erlbaum.
Zimmerman, B. J. 2002. "Becoming a Self-regulated Learner: An Overview." *Theory into Practice* 41 (2): 64–70.
Zimmerman, B. J. 2007. "Goal Setting: A Key Proactive Source of Academic Self-regulation." In *Motivation and Self-regulated Learning*, edited by D. H. Schunk, and B. J. Zimmerman, 267–295. New York, NY: Lawrence Erlbaum Associates.
Zimmerman, B. J., and M. M. Pons. 1988. "Construct Validation of a Strategy Model of Student Self-regulated Learning." *Journal of Educational Psychology* 80 (3): 284–290.