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ENHANCING SELF-REGULATED LEARNING IN HIGHER EDUCATION

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Abstract/Izvleček A key task of higher education is empowering students for in-depth learning, critical thinking, and assuming responsibility for learning and their future professional work. To attain these goals, it is crucial for students to acquire the ability to regulate their learning. This article presents the concept of self-regulated learning, together with the learning models and factors that contribute to the adequate application of self-regulating strategies. The latter depend on both students' individual characteristics and contextual factors. The processes of self-regulated learning can be learnt and lead students to more meaningful learning, greater satisfaction in studying, and better learning outcomes.

Keywords:
higher education, self-regulated learning, enhancing self-regulated learning, students' characteristics, learning context

Spodbujanje samouravnavanja učenja v visokošolskem izobraževanju Ena od osrednjih nalog visokošolskega študija je, da študente opolnomoči za poglobljeno učenje, kritično razmišljanje in prevzemanje odgovornosti za študij ter nadaljnje avtonomno delovanje v stroki. Za doseganje tega cilja je ključno, da študenti usvojijo zmožnost samouravnavanja učenja. V prispevku bova predstavili koncept samouravnavanja učenja v povezavi z modeli učenja in dejavnike, ki prispevajo k ustrezni uporabi strategij samouravnavanja. Slednja je odvisna tako od individualnih značilnosti študentov kot od kontekstualnih dejavnikov. Procesov samouravnavanja učenja se je moč naučiti in ti lahko študente vodijo do bolj osmišljenega učenja, večjega zadovoljstva pri študiju in boljših učnih rezultatov.

Ključne besede:
visokošolsko izobraževanje, samouravnavanje učenja, spodbujanje samouravnavanja učenja, značilnosti študentov, učni kontekst

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Introduction

In the early 20th century, psychology as a science began to establish itself, knowledge of the individual's functioning and learning was on the rise, and renowned reformers of education (such as John Dewey, E. L. Thorndike, and Maria Montessori) emphasised the importance of adapting the curriculum and education to students' individual differences (Zimm

erman, 2002). However, it also became obvious that teachers could not adapt their instruction to each individual student. Various empirical studies have shown that under some circumstances, certain teaching strategies suit certain students better than others, because they can interfere with the learning strategies that the students are already using (e.g. Shuell, 1988; Vermunt & Donche, 2017). Thus, researchers began to stress the significance of developing (meta-) cognitive, motivational, volitional, and affective strategies (Boekaerts & Cascallar, 2006; Garrison, 1997). Additionally, the concepts of self-regulated learning, autonomous learning, lifelong learning, etc. began to emerge (Boekaerts & Cascallar, 2006; Garrison, 1997; Vermunt & Van Rijswijk, 1988; Zimmerman, 2002). It became accepted that one of the key tasks of education is to teach students to learn how to be autonomous and responsible students who will be able to self-regulate their own learning (Delors, 1996; European Commission, 2019). Accordingly, Hornby (2018) highlights the development of metacognitive strategies as one of the eight key evidence-based teaching strategies which have contributed importantly to students' learning outcomes at all levels of education. Nevertheless, it is questionable how successful we have been in this, since many higher education teachers (probably) do not see it as their task, nor one that they are qualified to perform. They largely assume that the students who enter university have mastered learning strategies and are capable of self-regulated learning.

The central thesis of this article is that the processes of self-regulated learning can be learnt and that they lead students to more meaningful learning, greater satisfaction in studying, and better learning outcomes (Vermunt & Donche, 2017; Vermunt & Van Rijswijk, 1988; Zimmerman, 2002). We will examine the factors that influence the use of self-regulating strategies and suggest guidelines for the introduction of self-regulated learning in higher education. We will start by defining the concept of self-regulated learning in relation to different learning models.

Definitions and models of self-regulated learning

Simons and Vermunt (1986 in Vermunt & Van Rijswijk, 1988) define self-regulated learning as independent learning (or autonomous, or self-directed, or self-organized learning), which in its extreme form means that students are their own teachers. In higher education, students completely self-regulate their learning only in rare situations, and it is just as rare for teachers to regulate it completely. It is nevertheless important for students to acquire as many relevant learning strategies as possible and know how to apply them when necessary. A comprehensive definition of self-directed learning in adult education was provided by Garrison (1997, p. 18) "as an approach where learners are motivated to assume personal responsibility and collaborative control of cognitive (self-monitoring) and contextual (self-management) processes in constructing and confirming meaningful and worthwhile learning outcomes". He stressed the frequently incorrect understanding of the concept of autonomy as completely free decision-making about what makes sense to learn, regardless of initial competences and contextual contingencies. His ideas stemmed from the social constructivist perspective, and he emphasised that individuals develop knowledge in collaboration with others, and learning outcomes are important, since they have both personal meaning and social value. Here, it is important to draw attention to Shuell (1988), who stressed that the concept of autonomous learning does not refer merely to situations of independent learning, but also to learning situations where teachers and students interact in organised forms of education. A crucial defining aspect of autonomous/self-regulated learning is that students carry out certain learning activities on their own initiative, spontaneously, and in accordance with the set learning goals.

The definitions discussed so far demonstrate that their authors use different terms in very similar meanings: self-regulated, self-directed, self-organized, autonomous, or independent learning. This article focuses on higher education, which presupposes certain learning goals and competences that students should acquire. In spite of that, it is important that students assume responsibility for their learning, make sense of learning goals, set their own goals, and become able to plan and direct their learning so as to achieve them. This is our understanding of the term self-regulated learning, the term that is frequently used, and so we will continue to use it throughout this article.

Starting points for the development of learning models in relation to self-regulated learning

In the last 20 years of the 20th century, several authors began to study the connections between different conceptions of learning, learning motivations, approaches to learning, and learning outcomes (e.g. Biggs, 1990; Entwistle, 1984/2005; Ramsden, 1985; Van Rossum & Schenk, 1984; Šteh, 1999). It also transpired that it is more likely that students will take an in-depth approach to learning and acquire good quality knowledge if they understand learning as a personal construction of meanings and if they are intrinsically motivated. On the other hand, students with lower concepts of knowledge, such as memorization and accumulation, typically approach learning superficially, mainly driven by a fear of failure, which makes their knowledge superficial and short-term.

When describing typical learning activities and strategies, authors have introduced differentiation between processing activities, that is, the activities we employ to study a specific learning content, and those we use to regulate the very process of learning (Vermunt & Van Rijswijk, 1988). This led to several studies on the importance of metacognition (Zimmerman, 2002). This field was importantly shaped by Brown (1980 in Simons, 1997), who distinguishes between two meanings of metacognition: 1) the first refers to the metacognitive knowledge of cognitive processes (knowledge of how one learns what one knows and does not know, knowledge of learning tasks, when to use a specific principle); 2) the second meaning refers to the regulation and control of cognitive processes – the active monitoring and control of ongoing cognitive processes (planning how much time one needs to study a certain segment of subject-matter, testing one's progress, monitoring the development of one's understanding, and predicting the result, etc.). Studies show that both components play important roles in successful learning. Thus, Wang, Haertel, & Walburg (1990 in Simons, 1997) found that they were among the strongest predictors of school performance. The two components are interrelated, of course, because we need a certain amount of metacognitive knowledge to be able to regulate and control our learning, just as certain executive skills, such as reflection and evaluation, contribute to the development of metacognitive knowledge. Brown went on to inquire into how to teach metacognition and, working in collaboration with Palinscar, she developed the influential model of reciprocal teaching in the area of reading comprehension (Palinscar & Brown, 1984, 1989 in Simons, 1997 and Woolfolk, 2002). The model of reciprocal teaching was one of the key factors in effective

learning in John Hattie's (2009) renowned meta-analysis of influences on student achievement.

Vermunt and Donche (2017) termed the first research field, the one examining connections among concepts, learning motivations, approaches, and learning outcomes, the Student Approaches to Learning (SAL) tradition, and they linked the other one, the one examining metacognition, to the further development of Self-regulated Learning (SRL). Vermunt worked with various co-authors, trying to combine the two traditions into a more unified theoretical and empirical framework with a conceptualisation of a "learning patterns model" (Vermunt & Donche, 2017; Vermunt & Van Rijswijk, 1988). The model combines four components of student learning (Vermunt & Donche, 2017, p. 271): 1) cognitive processing strategies – the combination of cognitive learning activities that students employ to process subject matter and that lead directly to knowledge and understanding; 2) metacognitive regulation strategies – the combination of metacognitive learning activities that students use to plan, monitor, steer, and evaluate their cognitive learning processes; 3) (metacognitive) conceptions of learning – the metacognitive views and beliefs students hold about learning, teaching, etc.; and 4) learning motivations or orientations – the aims, goals, motives, and worries of students in relation to their studies, which represent the motivational-affective component of the model.

Describing a coherent whole of typical learning activities, beliefs, and learning motivation, Vermunt and his collaborators used the term learning style in their earlier publications, but since many understood it as too stable a personal trait, they introduced the concept of learning patterns as a more dynamic term around the year 2004 (Vermunt & Vermmetten, 2004). During this time, many empirical studies were being done to ascertain how the components of the model interrelated, and studies on student learning in higher education have repeatedly identified four qualitatively different patterns in the way students learn (Vermunt & Donche, 2017):

1) reproduction-directed learning – students typically try to memorise the subject matter as best they can, so as to be able to reproduce it during the exam; they depend on the teacher's directions; they perceive learning as the intake of knowledge from an external source; the central motivation is to pass an exam;

2) meaning-directed learning – students typically approach learning in an in-depth manner, which means they try to understand the meaning of what they learn, structure the learning material, and critically engage with what they learn; they learn in a self-regulated way; they perceive learning as their own construction of knowledge for which they are mainly responsible themselves; they are driven by personal interest;

3) application-directed learning – students typically try to discover relations between what they learn and the world outside; they try to find out how to use what they have learnt in practice; they are characterised by both self-regulation and external regulation; only knowledge that is useful is seen as valuable, and that is the essence of learning; the learning pattern relates to vocational motives; and

4) undirected learning – these students do not know how to approach learning, which is especially characteristic of students transitioning from secondary to higher education or from undergraduate to graduate studies, or for students from other countries with different pedagogical practices; they often experience a lack of regulation, doubt whether they are able to cope with the new learning demands; consequently, they especially appreciate the support of fellow students and teachers; their conceptions of learning emphasise stimulating education and cooperative learning; they typically adopt an ambivalent learning orientation.

The studies summarised by Vermunt and Donche (2017) generally indicate that meaning-directed learning is positively related to academic performance and undirected learning negatively. Relations between academic performance and reproduction-directed learning or application-directed learning are less consistent and depend, among other factors, on academic discipline, cultural context, and assessment methods. However, it is important to be aware that students with reproduction-directed learning can perform well if exams require merely knowledge reproduction.

Vermunt's model was one of the first learning models to combine different learning components. Another early model was developed by Garrison (1997). Defining self-directed learning, it combines three overlapping dimensions: 1) self-management,

which involves shaping the contextual conditions in the performance of goal-directed actions; 2) self-monitoring, which includes both cognitive and metacognitive processes; it is crucial that individuals take on responsibility and direct their learning so that new and existing knowledge structures are integrated in a meaningful manner and learning goals are being met; and 3) entering motivation and task motivation, which are decisive in whether students are willing to engage, how much effort they make, and how they see their own roles and responsibility in the entire process. "Issues of motivation, responsibility and control are central to a comprehensive concept of self-directed learning" (Garrison, 1997, p. 29). Garrison concludes by stating that the most important challenge faced by teachers is to create the educational conditions that will facilitate self-direction in students, since he sees it as a condition for achieving worthwhile and meaningful education outcomes and further educational growth. His description of such a student overlaps with the learning pattern described above and called "meaning-directed learning" (Vermunt and Donche, 2017).

Other component models of self-regulated learning have also been proposed. Zimmerman based his model on studies of self-efficacy and motivation (Garrison, 1997; Zimmerman & Schunk, 2011). He defines self-regulated learning from the process aspect as the student's proactive learning, which includes generating one's own thoughts, emotions, and knowledge directed towards the attainment of set goals (Zimmerman, 2000 in Zimmerman 2002). In developing his three-stage model of self-regulation, Zimmerman (2002) took account of the following:

1) Self-regulated learning does not only include the knowledge of one's own thinking and skills; the key factors are self-awareness and self-motivation in order to activate and apply knowledge at crucial moments during learning performances.

2) It is not about a personality trait that certain students possess and others do not. It is about the selective use of specific self-regulatory processes that learners must adapt to each new specific learning task: setting specific proximal goals, adopting powerful strategies for attaining the goals, monitoring one's performance, restructuring one's physical and social context to make it compatible with one's goals, managing one's time

efficiently, self-evaluating one's methods, attributing causation to results, and adapting future methods.

3) The quality of self-motivation in self-regulated learning depends on a number of beliefs, including perceived efficacy and intrinsic interest. Motivation, however, does not originate in the task itself, but mainly in students' use of self-regulatory processes, such as self-monitoring, when they focus on and act in accordance with the signs of progress.

The author then divides self-regulatory processes into three cyclical phases, emphasising that prior experiences always have an impact on the entry phase: 1) the forethought phase refers to the processes and beliefs that occur before efforts to learn; it includes task analysis (goal setting and strategic planning) and self-motivation, originating in the beliefs that students have about themselves as learners, outcome expectations, intrinsic interest, and learning goal orientation; 2) the performance phase refers to the processes that occur during behavioural implementation; it consists of self-control (e.g. self-instruction, attention focusing, etc.) and self-observation (e.g. self-recording of the time needed to carry out a specific task or checking which learning strategy is more effective); and 3) the self-reflection phase refers to the processes that occur after each learning effort; it consists of self-judgement (comparison of one's achievements with others' achievements, with specific standards, identifying causes for success/failure, etc.), and self-reaction (feelings of self-satisfaction, defensive or adaptive reactions).

Boekaerts and Cascallar (2006, p. 199) stress that "most researchers agree that self-regulation refers to multi-component, iterative, self-steering processes that target one's own cognitions, feelings, and actions, as well as features of the environment for modulation in the service of one's own goals". Compared to Zimmerman's definition, they especially emphasise the student's ability to adapt learning circumstances, which is also part of Zimmerman's model as well as other authors' (e.g. Garrison, 1997; Vermunt & Donche, 2017). Other authors similarly stress that the essence lies in regulating one's learning so as to achieve the set learning goals. These must correspond to the requirements of the learning situations and the goals of individual subjects or courses, while also having personal meaning for each student (Garrison, 1997).

The models of self-regulated learning are generally individually oriented, with the key importance ascribed to "agency", that is, the capacity of individuals demonstrating their power of decision-making and in controlling their behaviour in accordance with the goals (Swann & Jetten, 2017; Volet, Vauras, & Salonen, 2009). Recently, new models have been emerging that take account of the embeddedness of the learning process in specific contexts with certain social and cultural characteristics, with all the opportunities and obstacles created by social interaction. The context is formed by other people, for instance teachers and students, the structure of the learning task, pedagogical principles in each institution, and discipline. Volet et al. (2009) maintain that regulatory mechanisms are found at the level of the individual as well as at interpersonal and social levels. The term co-regulation has also been gaining ground, meaning that "several participants, relating to a joint task and goal of an activity, use shared reference values and norms to maintain the joint space of activity and mutually correct deviations at the dyadic or group level" (Volet et al., 2009, p. 222). The situative perspective states that in socially coordinated learning situations, there is complementarity between the individual and social levels of regulatory processes (Järvenoja, Järvela, & Malmberg, 2015).

Boekaerts and Cascallar (2006) inquired into why some students manage to self-regulate their learning and others do not and, besides, the same students differ regarding their learning conditions. To help answer this question, they developed Boekaerts' dual processing self-regulation model, which differentiates between two main pathways: the growth and the well-being pathway. In the growth pathway, students initiate an activity because they value their goal (better understanding of a phenomenon or making new friends, etc.) and are prepared to put energy into its pursuit (self-regulation is energized from the top down). They use problem-solving coping strategies. In the well-being pathway, students focus on cues in the learning environment and use energy to prevent (further) negative events (cue-driven or bottom up self-regulation). It is encouraging that the path can always turn positive if a specific goal has some value for the student and if they believe they can reach it (Boekaerts, 2007; Boekaerts & Cascallar, 2006; Garrison, 1997). In the next section, we will discuss the factors that influence whether students direct their learning and make efforts to attain meaningful and worthwhile learning outcomes.

The dynamic interplay between self-regulated learning, cognition, emotion, motivation, and learning contexts

The definitions given above demonstrate that there are differences among students in terms of their approaches to studying and the cognitive, affective and regulating strategies that they apply. Moreover, learning patterns change through time and in different contexts (Boekaerts & Cascallar, 2006; Vermunt & Donche, 2017). In this section we are especially interested in the origins of the differences among students as to when, why, and how they use the strategies of self-regulated learning. These differences among students and in each student can be explained as the result of interaction among various factors, students' personal characteristics as well as contextual factors within the teaching-learning environment (Adams, Ware, Miskell & Forsyth, 2016; Donche, De Maeyer, Coertjens, Van Daal, & Van Petegem, 2013; Järvenoja et al. 2015; Vermunt & Donche, 2017). We will now highlight some of the most important and frequently studied factors of self-regulated learning, while keeping in mind that there are many more and that they interrelate in complex ways.

Students' personal characteristics

Various authors list the student characteristics and abilities that are a condition for self-regulated learning: cognitive abilities and strategies, personal characteristics, prior experience and knowledge, emotional and motivational characteristics, patterns of attributions of academic success, and beliefs about oneself, learning and knowledge (Boekaerts & Cascallar, 2006; Vermunt & Donche, 2017). If we are to self-regulate our learning, we should first and foremost have developed specific (meta-)cognitive abilities and strategies, such as orienting oneself before starting on an assignment, collecting relevant resource material, integrating different theoretical viewpoints, monitoring for comprehension, etc., but it is crucial that we keep adapting these strategies to the demands of each specific learning situation. This, of course, does not suffice, since students also need to self-regulate their motivation for learning and their effort investment, which always relates to specific social expectations and rules (being a responsible learner, living up to the teacher's expectations, etc.) (Boekaerts & Cascallar, 2006). Metacognitive proficiency is related to the ability to reflect and think critically (Garrison, 1997). It is essential to possess critically oriented thinking, in other words, our willingness to identify and consider the assumptions that are the foundation of our beliefs and behaviours, to test their

soundness, formulate new alternative views, and so on (Šarić & Šteh, 2019). Students should be aware of their assumptions about learning and common learning patterns, and then question these. The second meaning of critical reflection refers to the social context, values, and fundamental social issues that must be taken into account. Here, students question the purpose of specific learning tasks and the value of specific knowledge, while becoming aware of their own roles in constructing the knowledge that is valuable in a specific community.

Empirical studies have revealed links between students' learning strategies and their personal characteristics in accordance with the model of the big five personality traits, with the links appearing in openness, conscientiousness, and neuroticism, but not in extraversion and agreeableness (Donche et al. 2013; Chamorro-Premuzic & Furnham, 2009; Vermunt & Donche, 2017). In the study by Donche et al. (2013), openness was found to be related to deep and concrete processing and self-regulation; furthermore, it was also associated with lower levels of surface processing, external regulation, and lack of regulation. The latter was related to neuroticism, while conscientiousness was positively related to both self- and external regulation and negatively associated with a lack of regulation. In addition, conscientiousness was positively related to the use of an analytic processing strategy. Even though the correlations were moderate, they were statistically significant and had the effect on learning strategies independently of teaching strategies. This and other studies (e.g. Chamorro-Premuzic & Furnham, 2009) show that the impact of students' personality traits in understanding the way students approach their learning cannot be overlooked.

Researching Dutch university students, Vermunt (2005) established a correlation between the students' learning patterns and prior education, age, and gender. In accordance with expectations, the less educated demonstrated more characteristics of a lack of regulation. Also expected was the finding that the older the students were, the more they adopted a meaning-learning pattern. The main gender difference was in that women placed more value on cooperative learning then men.

Prior learning experiences can trigger expectations and beliefs that can impact significantly on perceptions of the current learning situation, on current decisions, and on the effort the students are willing to invest in further learning (Boekaerts & Cascallar, 2006). Perceptions and beliefs regarding a learning situation or task and

beliefs regarding oneself as a student (e.g. I'm no good at statistics) may arouse both positive as well as negative emotions (happiness, anger, despair, etc.). Having gone through years of education, students have developed specific ways of facing their emotions (Boekaerts, 2007). Emotion regulation is an important aspect of self-regulated learning (Boeakerts & Cascallar, 2006). The dual processing self-regulation model by Boekaerts (2007) assumes two parallel pathways of self-regulation. When students encounter obstacles in their learning, they either use problem-solving coping strategies (e.g. determining the reasons for the lack of success, gathering more information, redesigning a plan for action) or emotion-focused coping strategies (giving up, looking for emotional support, swearing). The effort used in the emotion coping strategies interferes with task engagement and persistence. Doing research in the higher education context, Ben-Eliyahu and Linnenbrink-Garcia (2015) found, that depending on their preference for a study course, students used different emotion-regulating strategies. While there is not enough data on the link between emotions, self-regulation strategies for emotions, and different learning outcomes, their study showed that self-regulated emotion strategies vary according to the context, in this study the course preferences (favourite and least favourite courses). Inevitably students will be confronted with some tasks they dislike; however, it is important that students also manage the emotional aspects of academic requirements so that they remain engaged in the academic tasks and persist through different learning contexts (Ben-Eliyahu & Linnenbrink-Garcia, 2015).

Postareff, Mattsson, Lindblom-Ylänne, and Hailikari (2017) studied the links between emotions, study approaches, and learning achievements in Finnish students. They established the most common positive emotions to be enthusiasm, interest, satisfaction, and contentment, and the most negative ones reported by the students were dissatisfaction, confusion, and anxiety. They employed cluster analysis to divide students into three groups. In the first cluster, students experienced mostly positive emotions and were quickly progressing in terms of study success, while adopting a deep approach to learning. The students in the second cluster were also quickly progressing, with a deep approach to learning but mostly experiencing negative emotions of frustration and anxiety. In the third cluster, the students were mainly experiencing negative emotions, with slow progress and a surface approach to learning.

Motivational factors are frequently considered to be an important feature of self-regulated learning. According to Zimmerman (2002), the key characteristics of students who self-regulate their learning are "personal initiative, perseverance, and adoptive skill" (p. 70). According to the self-determination theory by Ryan and Deci (2017), higher levels of intrinsic and autonomous motivation lead to more self-regulated learning, whereas extrinsic motivation is related to controlled, externally regulated behaviour. Even though theoretical accounts provide a clear relation between motivation and self-regulated learning, empirical studies show inconsistent and contradictory evidence. For example, Donche et al. (2013) found controlled motivation to be positively associated with external regulation and surface processing of the subject matter, whereas autonomous motivation was positively related to all regulation strategies as well as amotivation. Moreover, in a review of self-regulated learning interventions, de Bruijn Smolders and colleagues (2016) reported that some interventions had a positive and some a negative effect on motivation and self-efficacy. As suggested by Donche et al. (2013, p. 248), such results might indicate that "there is not always a consistent relationship between students' study motives and regulation strategies".

One of the motivational factors often studied in relation to self-regulation is students' goal setting. McCardle, Webster, Haffey, and Hadwin (2017) examined the characteristics of students' self-set goals in an authentic university setting. They proposed four specific properties of goals as being helpful in self-regulating students' learning: timeframe, action, standard, and content. Timeframe breaks down long-term, distant goals into short-term goals that help with monitoring and evaluating the study process, down to a single study session. This is important in higher education settings where the timeframe for specific tasks is often concentrated in a defined exam period at the end of the semester. Next, effective learning goals should specify concrete cognitive actions regarding the subject matter, such as identification, comparison, and application. Third, effective goals state specific standards to be used in the evaluation of the learning process (e.g. examine the similarities and differences between two theories; summarize the material in my own words). Finally, to focus attention on the substance of learning instead of the sequence of tasks, learning goals should specify the content (or concepts) in order to guide students to relevant study materials. In their examination of the self-set goals of the students enrolled in the *Learning Strategies* course during a semester, McCardle et al. (2017) found that students' goals were generally very vague and

lacked the above-mentioned properties; furthermore, improvements across the semester were inconsistent and lower than expected. These results indicate that students have difficulties in employing self-regulating strategies, despite the support of a specific course in learning strategies. Therefore, interventions to support students in goal setting for autonomous learning should place more emphasis on the quality of student-set goals.

Another line of research on educational goals is the achievement goal theory (Pintrich, 2003). Goal orientations guide students' interpretation of and response to learning tasks (Linnenbrink, 2007). Different models have been proposed with two, three, four or six goal orientations (Hall et al. 2016); however, here we highlight two general goal orientations: mastery and performance goal orientations:

Mastery goals orient the student towards learning and understanding, developing new skills, and a focus on self-improvement using self-referenced standards. In contrast, performance goals represent a concern with demonstrating ability, obtaining recognition of high ability, protecting self-worth, and a focus on comparative standards relative to other students and attempting to best or surpass others. (Pintrich, 2003, p. 676)

De Clercq, Galand, and Frenay (2013) have confirmed the results of numerous previous studies that the mastery goal orientation predicts students' use of deep processing strategies. Their study showed that students' mastery goal orientation increases deep processing, which in turn implies the development of self-regulation. These three factors also interact with one another, which revealed a different direction of the impact. The impact of these factors changes over the years of study: in the first year of study, the use of deep processing strategies increases the use of self-regulation strategies; later, these factors seem to reinforce each other.

Context characteristics

Since we are presented with a great variety of students, it is important to create learning environments that enable students to collaborate in order to gain knowledge and reflect on their understanding of whether they have reached their goals, that is, what counts "as worthwhile knowledge" (Garrison, 1997, p. 23). Teaching strategies are one part of the context on which the teacher has an especially significant

influence. These include instruction comprising interactive, active, and collaborative forms of work, experiential learning, project work, etc. What is especially important here is feedback on acquired knowledge and the ways of assessment.

Vermunt and Donche (2017, p. 288-289), who have analysed studies of the effects of certain pedagogies in higher education in terms of fostering the quality of student learning, reached very interesting conclusions. They showed that approaches like problem-based learning, case-based learning, and integrated contextual teaching can foster meaning-directed and application-directed learning and, accordingly, students employ more self-regulation skills, too. However, the authors stress that the approaches need to be introduced gradually, otherwise they may be counterproductive.

In the study on students' learning strategies by Donche et al. (2013), regarding the impact of personality traits, researchers also examined the role of teaching strategies. Besides the weak or moderate associations of self-regulation and personality traits, they found that teaching strategies were also related to students' regulation strategies. They distinguished between direct instruction (high teacher control over the student's learning, and a highly transmission oriented, content-focused approach to teaching) and a learning-focused or student-focused approach to teaching (enabling the student to take more control over their learning). Consistent with theoretical predictions, discovery-oriented learning, with overlapping characteristics of learning-focused teaching, was positively associated with self-regulation and deep processing. Unexpectedly, though, external regulation and surface processing were also associated with discovery-oriented learning, and direct instruction was associated with lower levels of external regulation. Different explanations for the incongruent results are possible. One is the impact of negative friction for some students, especially those not used to higher levels of autonomy, while the strong presence of external control leaves little strategic choice for students to make more or less use of this control. Another explanation is that a perceived heavy workload might contribute to a greater use of survival strategies. Inconsistency in the empirical data and theoretical predictions might also proceed from other contextual factors, such as assessment practices.

An important contextual factor is certainly assessment, which exerts an important impact on how students approach their study materials (Bloxham & Boyd, 2007;

Gibbs & Simpson, 2004-05). The teacher's feedback during the study process is especially important (Garrison, 1997). Because students differ, there is no single best way of formulating and providing feedback; some students need more information from external sources, while others rely more on internal resources and their own judgement (Verumnt & Donche, 2017). Nicol and Mcfarlane-Dick (2006) have suggested seven principles of feedback practice that "might strengthen the students' capacity to self-regulate their own performance" (p. 205). Good feedback practice (Nicol & Mcfarlane-Dick, 2006):

1) helps clarify what good performance is (goals, criteria, expected standards);

2) facilitates the development of self-assessment in learning (training in self-assessment skills, selecting own works for portfolio, etc.);

3) delivers high quality information to students about their learning (feedback provides corrective advice, gives students the opportunity to act on the feedback);

4) encourages teacher and peer dialogue around learning (e.g. reviewing feedback in tutorials; feedback as an iterative practice);

5) encourages positive motivational beliefs and self-esteem (feedback is focused on performance only, drawing attention to self-esteem can have a negative effect on attitudes and performance);

6) provides opportunities to close the gap between current and desired performance (e.g. increased opportunities for resubmission);

7) provides information to teachers that can be used to help shape teaching.

The contextual features of self-regulation are highlighted by the situative perspective, which recognizes that the regulation of learning is aimed at two levels: the regulation processes of an individual student and the regulation processes at the group level, in which individual and common goals occur together (Järvenoja et al., 2015). Interaction between group members is directed to achieving collaborative learning tasks, whereby the regulation of the learning activities is directed to self-,

other- and group level. Socially shared forms of regulation include, for example, discussion of the understanding of the learning task, sharing ideas, encouraging each other when facing challenges, etc. (Järvenoja et al., 2015; Volet et al., 2009). Järvenoja, Näykki, and Törmänen (2019) studied students' emotional regulation in collaborative learning situations. They found that the socially shared or co-regulation of emotion was relatively rare; however, the results indicated that group-level emotion regulation was triggered by different types of challenging situations (cognitive, emotional, motivational, and social context challenges). Their results address an important issue in students' "ability to regulate and coordinate collaborative activities" (p. 1755) that allows success in joint learning processes.

Adams et al. (2016) proposed a concept of the self-regulatory climate which is based on the self-determination theory of motivation by Ryan and Deci (2017). A self-regulatory climate is defined as a set of norms that support three basic psychological needs: autonomy, relatedness, and competence. These norms are collective faculty trust in students, collective student trust in teachers, and student-perceived high expectations regarding academic achievement (Adams et al., 2016). However, motivational effects were not studied, so it remains a theoretical argument that still lacks empirical evidence. So far, we have only theoretical hypotheses that a climate of high trust and academic emphasis enhances the motivation that relates to deeper approaches to learning and to higher autonomy levels.

Conclusions

In conclusion, it is important to stress again that developing self-regulated learning is a major task for higher education. There is consensus that the goal of higher education is developing autonomous individuals who have an in-depth knowledge of a specific field; who are willing to continue learning and broadening their knowledge to benefit society; who can make critical judgments and autonomous, responsible decisions in their future professional work (Boud, 2000; Vermunt & Donche, 2017). These ambitious goals of education can be attained more easily if students are directed towards proactive and responsible learning; if they make sense of their goals during their studies; if they monitor their achievements; and if they can judge the quality of the achievements autonomously.

Research shows that self-regulatory processes can be learnt (Zimmerman, 2002) or existing learning patterns developed (Vermunt & Donche, 2017), but we should be aware that the process is not at all straightforward or necessarily successful. It is particularly challenging because students differ in their characteristic learning patterns; thus, they require different enhancement methods when developing these patterns; therefore, the use of diverse teaching methods will more readily accommodate students with different characteristics and needs (Vermunt & Donche, 2017).

Interventions to develop self-regulated learning relate positively to self-regulated activities, motivation, and academic achievement (de Bruijn-Smolders, Timmers, Gawke, Schoonman, & Born, 2016; Jansen, Leeuwen, Janssen, Jak, & Kester, 2019). A systematic review of the effectiveness of self-regulated learning interventions by de Bruijn-Smolders et al. (2016) also reveals mixed and unclear relations regarding the influence of motivation and self-efficacy. Furthermore, students' engagement in different self-regulating activities is only partially related to their achievement (Jansen et al., 2019), so additional mediating factors (e.g. motivation, time on task, self-efficacy) also influence the effectiveness of self-regulated learning interventions. Planning such interventions is clearly not a simple task, since individual elements have different effects on final learning outcomes.

What do all these various study findings tell us about self-regulated learning in terms of its enhancement, and what guidelines can we develop based on these? Students are undoubtedly very different, and we must never stop asking what typifies the group of students we teach or thinking about how to stimulate them to use adequate self-regulating strategies. We should remain aware that our approaches and guidelines cannot always address all our students successfully. Therefore, it is imperative to be as flexible and varied in our teaching strategies as possible. Research findings show that some students have problems setting goals, so we should support them when setting short-term and concrete goals. This will make it easier for them to make sense of their learning. They also need the right amount of support and guidance for their learning without excessive control. Students will only be willing to invest effort in learning if they find it meaningful, if they feel we believe in them, and if they think they can succeed. It is crucial that we encourage mastery goal orientation, where the key role is played by formative feedback and final assessment, which reward primarily an in-depth understanding of concepts and the acquisition

of relevant competences. Students can significantly support each other in co-regulation of learning. Consequently, it is important to consider how to organise learning in smaller groups, in a range of projects, and to encourage students to reflect on collaborative learning.

We should be aware that students are unlikely to take on responsibility for making sense of their learning if they have only minor control over it (Garrison, 1997, p. 24). To achieve a shift towards learning that makes sense to students and to attaining goals that they find relevant, the teacher should exert less control, and more responsibility should be accepted by students themselves. Moreover, they will be ready to bear more responsibility if they are faced with meaningful challenges and if they are intrinsically motivated; if they are given just the right amount of support by their teachers and fellow students; and if they believe they can reach their goals.

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