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# Bringing about change in the classroom: strengths and weaknesses of the self-regulated learning approach—EARLI Presidential Address, 2001

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## Abstract

In an attempt to help both students and teachers to change their traditional roles in the classroom, educational psychologists have engaged in two types of projects. The first project can be condensed to “understanding the dynamics of self-regulated learning”. The second project can be summarized as “understanding the dynamics of powerful learning environments as a way to promote self-regulation in the classroom”. In this essay I attempt to establish the centrality of self-regulation as a theoretical assumption and a fundamental psychological construct. I argue that most current psychological models of self-regulation, and by implication the innovation programs that are based on these models, are not well focused, are incomplete, and harbor many misconceptions. I also argue that educational psychologists need to broaden the way they conceptualize the dynamics of learning contexts and find new ways to study the integrated processes that make up self-regulation in the context of the classroom. My main message is that students bring their own goals to the classroom and that these goals are the key to their adaptation system. These personal goals give meaning and organization, or in other words purpose, to a student’s adaptation processes in the classroom. Some of my comments are critical, but I do not intend to discredit the important work that has been done in this area. Rather, I want to argue that educational psychologists need to broaden the way they conceptualize the dynamics of learning contexts and find new ways to study the integrated processes that make up self-regulation in the context of the classroom. Doing so requires not only using a kaleidoscope of teaching methods, but also looking beyond these methods to explore the possibilities of theories that remain marginalized in educational research.

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## **1. Bridging instruction to learning**

The theme for the ninth EARLI conference was ‘bridging instruction to learning’. Hence, it was appropriate to ask: what does it mean to bridge instruction to learning? In the past half a century, various attempts have been undertaken to link the world of instruction to the world of learning. The types of bridges built between these two worlds in the past reflect the theories about learning and instruction that were popular at that time. For example, in the 1970s, educational researchers adopted a uni-dimensional representation of students by learning achievement. Within this context, a first bridge was constructed, labeled ‘aptitude-treatment interaction’ (ATI). Instruction methods were viewed as treatments and their interaction with salient student aptitudes, such as intelligence, motivation and anxiety was studied. Teachers were encouraged to take account of individual differences by varying their teaching methods and researchers studied the impact of these methods on students’ achievement. Teachers, who took researchers seriously, soon discovered that the principles emanating from ATI research were not solid enough to guide teaching practice. Researchers replied that ATI research was never meant to be a bridge for teachers, only researchers should use it.

In the 1980s, educational researchers replaced outcome-based models with learning acquisition models. They investigated the cognitive strategies that successful students used and described how they guided and directed their own learning. The ‘learning-to-learn’ principles that resulted from this approach were used as the pillars of a new bridge that was to connect instruction to learning. Worldwide, teachers were trained to use these learning-to-learn principles in order to optimize their students’ learning strategies. Toward the end of the 1980s, theories of learning and instruction were extended enormously. One of the major findings was that students’ cognitive strategies, their goal orientations, self-efficacy beliefs, and attributions differ by domain. Researchers regrouped and investigated the properties of different domains of learning, for instance in mathematics, reading, and writing. The best-known example is that of the Cognition and Technology Group at Vanderbilt (1992) that proposed a coherent set of principles for the design of learning environments which promote mathematical thinking and extended mathematical problem-solving skills to other parts of the curriculum. The interrelated design principles proposed by the Vanderbilt group can be seen as the pillars of a new type of bridge. Other research groups focused on the dynamics of self-regulated learning and designed learning environments in which students learn to be their own teacher, using the so-called meta-cognitive skills. All over the world, research teams are currently using these design principles to construct their own powerful learning environments (PLEs), and importantly, they are setting up collaborative research with teachers to evaluate the solidity of the PLEs they are constructing. Thus, in the 1990s we saw

increased interaction between researchers and teachers in an attempt to understand the dynamics of PLE as a way to promote self-regulated learning. Nevertheless, it is important to ask: “What is the status of these new bridges and for whose benefit are they being constructed?”

Although there are several examples of successful programs where researchers trained teachers in the use of the principles of self-regulated learning in a domain and invited them to promote these principles in their students, I am not convinced that teachers actually find these principles sufficiently functional to guide their teaching. Currently, there are many signals that teachers perceive the PLEs, which researchers helped them to create, as incomplete conceptions of the real world of teachers and students. Teachers seem to relax or even abandon the instruction principles after the trainers have left the premises. In general, teachers feel that they are not good at heading off on their own into uncharted waters. They need to have easy access to material resources, including renewed textbooks, worksheets, ICT-material, and training facilities.

My line of argument is that most of the PLE bridges that have been constructed are limited in scope. They connect two artificial worlds, namely content-driven theories of instruction to content-driven theories of learning, which are two representations of reality, and not reality itself. I suggest that these bridges could be made more meaningful and functional for teachers, as well as for the community of researchers, by broadening our conception of the different contexts within which students learn and interact with teachers and peers. It is essential that we liberate ourselves to a degree from the content-driven theories of learning and instruction that have dominated the scene for decades and supplement them with context-driven theories. The latter approach brings in the principle of unitary functioning, thus focusing on the whole-person-in-context.

## **2. Focusing on the whole-person-in-context**

### *2.1. Understanding adaptation system*

Current theories of self-regulated learning do not deal with the whole-person-in-context. The focus is exclusively on academic goals, and the students’ and teachers’ socio-emotional goals are largely ignored. Yet, these goals may provide a favorable or unfavorable context for the pursuit of academic goals. In order to illustrate what I mean by the contextual approach, I would like you to consider a tropical rainforest. In this ecosystem, a complex and dynamic community of plants interacts and competes for resources. My insight into the structure and processes of the rainforest are based on the studies of Ayensu (1982) and Collins and Sayer (1990) as well as the information drawn from the Internet.

In rainforests, trees and plants tend to form a strata of foliage at different levels above the ground. Lowland rainforests tend to have five strata. The first layer is called the emergent layer because giant trees tower 60 m above the forest floor. The second layer is called the canopy layer because it forms an umbrella over the remain-

ing layers where 20–30 m high evergreens stop the rain and sunshine. Most photosynthesis takes place at this level, promoting growth, flowering, and fruiting of the trees. Little sunshine reaches the third layer, which is called the understory layer. Trees seldom reach the height of 4 m. Many palms, ferns, vines, and juvenile trees as well as lianas and epiphytes, which use the trees for support to reach for the sunlight, can be found at this level. Table 1 provides a summary of the conditions at the different layers. As can be observed, environmental conditions are different at the five layers. Nearer the forest floor, conditions are poor and quite stable. The humidity is very high beneath the understory layer; only 5% of the available sunshine actually filters through the canopy, and there is no wind. This means that only shade-tolerant plants, such as bushes and many kinds of ferns, can survive here. The fifth layer is the forest floor, which is dark and very low in nutrients. Only mosses, fungi, and roots can be found here.

So far I have shown that there are different microclimates in the rainforest and that plant survival depends to a large extent on the inherent characteristics of the plants (e.g. size) and their position in the rainforest. Next, I will illustrate that survival also depends on the ability of the plants and trees to adjust to the local conditions. Three keywords describe the interaction processes that take place in the rainforest: adaptation, interdependence, and disturbance. I will describe each of them in turn, beginning with *adaptation*. All the trees and plants have to adapt when conditions are sub-optimal. Obvious examples of sub-optimal conditions are found in the understory, where plants have to adjust to the poor light conditions. Some plants develop broader leaves to intercept more sunlight. Other plants are able to grow towards the light, using other trees for support. Interestingly, many plants that are known for their beautiful flowers do not flower in the understory. They conserve energy by remaining green throughout the year and by not producing flowers or fruits.

It is important to realize that plants that are located in the top layers of the rainforest also experience adverse environmental conditions, which may be overlooked easily because tall trees enjoy plenty of sunshine, modest humidity, plenty of wind and rainfall, as well as variance in temperature (see Table 1). These conditions are ideal to reach maturity and reproduction. However, trees and plants develop a shallow root structure due to the low nutrient soil conditions in the rainforest. When environmental

Table 1  
Summary of the conditions at the different layers

	Sunshine	Humidity	Rainfall	Variance in temperature	Wind velocity
Emergent layer	****	*	****	****	****
Canopy layer	****	**	****	***	***
Understory layer	***	***	***	**	**
Bushes scrubs	**	****	**	*	*
Forest floor	*	****	*	*	*

Note: Based on Collins and Sayer (1990).

hazards, such as high winds, lightening, and flooding strike, the tall trees can survive only if they have grown buttress roots from the main trunk. Some roots grow from the trunk till 5 m above the ground.

A beautiful example of *interdependence* in the rainforest is ‘crown shyness’ (see Collins & Sayer, 1990 for discussion). As can be seen in Fig. 1, the taller trees accommodate the understorey plants by forming crowns that fit together like the pieces of a giant jigsaw puzzle, yet remain about a meter apart. This phenomenon is not yet fully understood. Each individual crown is supported by a simple pattern of branches and the leaves are positioned in such a way that the minimum amount of overlap is created and each leaf can absorb all the light it needs to photosynthesize efficiently. A third key to vitality and diversity in the rainforest is *disturbance*. When adverse conditions or old age cause the tall trees to fall down, they leave a gap in the canopy. This gap is usually quite large because the trees are linked together by very strong and elastic lianas. Such a gap of light shakes the forest equilibrium till its foundations. Saplings of the tall trees as well as many plants in the understorey have endured many years of minimal growth. In order to become mature and reproduce, they need full light. When there is a gap in the canopy, these plants show spurts of growth to reach the canopy. It is their chance to become mature, to flower, and to reproduce.

## 2.2. *Understanding the student’s adaptation system*

What does the rainforest have to teach us in the context of self-regulated learning and modern teaching practices? I argued that insight into the structure of the rainforest is necessary to understand the interaction processes that take place there, more specifically to understand why trees and plants compete, adjust to each other, and

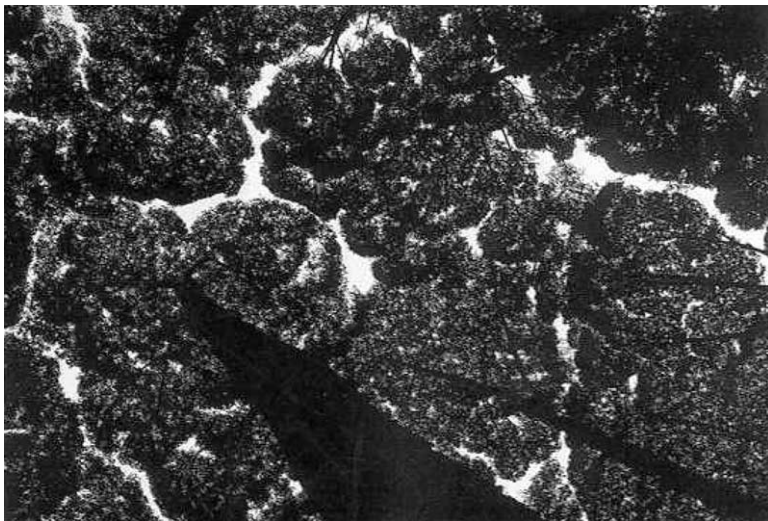


Fig. 1. Crown-shyness is an example of interdependence (Collins & Sayer, 1990).

seek and provide support. In a similar vein, insight into the structure of the classroom is necessary to understand the interaction processes that take place there. A classroom can be viewed as a complex and dynamic community of youngsters, which interacts and competes with each other for resources. In order to understand why some youngsters adjust to the teacher and to each other easily while others rebel against the teacher and refuse to seek and provide support, it is essential to understand the nature of the self-regulation processes that take place in the classroom. What is known about these processes?

In traditional classrooms, interaction processes are asymmetrical. Teachers shed light on the curriculum and they assist and support students in their attempts to master it as best as they can. In return for their guidance and support, teachers expect students' undivided attention. They prompt them to demonstrate their ability and to adjust to the learning conditions, often chiding them for not putting in enough effort. Remarkably, in traditional classrooms there is not much room for self-regulated learning. Students are cognitively, emotionally, and socially dependent on their teachers who formulate the learning goals, determine which type of interaction is allowed, and generally coerce them to adjust to the learning environment they have created. Covington (1992) described the destructive dynamics of schools that are set up in terms of a competitive learning game where teachers are the gatekeepers of success and approval. Interestingly, the principle of conservation of energy that operates in the rainforest (in the understory plants that deliberately refrain from fruiting and flowering) can also be observed in students who find it difficult to keep with the pace or are blinded by the performance of their more fortunate peers. Various forms of self-protective strategies have been described, such as self-handicapping (Covington, 1992), effort avoidance (Rollett, 2001), and dis-identification with school (Van Laar, 2001). Similar to tall trees in the rainforest, bright students may also experience adverse environmental conditions, which may easily be overlooked.

With the advent of social constructivism and PLEs, the classroom scene has dramatically changed. Symmetrical interaction patterns are the rule rather than the exception and teachers hold a new set of goals for their students. They want them to master the curriculum in such a way that they can regulate their own learning and update it in the future. In addition, they want them to be able to learn with and from their peers and take responsibility for updating and sharing knowledge and skills. These new perspectives of student learning and achievement necessarily imply that the familiar ecosystem characterized by content-driven, teacher-directed learning, and students' adjustment to sub-optimal learning conditions is slowly being replaced by a kaleidoscope of different ecosystems, called PLEs. The precise nature of the self-regulatory and social processes that take place in these ecosystems is not well understood but interest in these processes has far outrun the available evidence as to their effects.

My argument is that despite the successes of some of the innovation programs, researchers tend to forget that the research literature is still full of speculation about the beneficial effects of the principles of social constructivism for all the learners and the subject-matter areas. More often than not, researchers feel empty-handed when teachers ask them for the guidelines for promoting and assessing self-regulated

learning in students, who demand external regulation and refuse to participate in group problem-solving because they would rather work on their own. In fact, researchers are largely unaware of the disturbance that is currently being caused in classrooms all over the world by instruction methods based on the principles of social constructivism and self-regulated learning.

Although I am convinced of the centrality of self-regulation as a fundamental psychological construct and I have great hopes that self-regulation can be turned into a meaningful and functional construct for teachers to create PLEs, I have major concerns about the way educational psychologists have incorporated it into their theories of learning and instruction. I am afraid that our theories of self-regulation to date are not well focused, are incomplete, and harbor many misconceptions and false assumptions. In short, there is an urgent need for theory-based principles of self-regulation that guide research and practice. In Section 3, I will point toward a few drawbacks that I have come across in my readings and observations in the classroom.

### 3. The nature of self-regulation

#### 3.1. *Current theories of self-regulation are not well focused*

Inspection of definitions of self-regulated learning shows that the self is mentioned but is not equivalent to a student's personal goal system. Schunk and Zimmerman's (1994; p. IX) definition is probably the most quoted one: "...self-generated thoughts, feelings, and actions which are systematically oriented toward attainment of their goals". It is clear from this definition that self-regulated learning implies that: (1) students orient toward the attainment of *their own* goals, (2) they *generate* thoughts, feelings, and actions in order to attain these goals, and (3) that they work *systematically* toward the attainment of these goals. Yet, most educational researchers' analyses of self-regulatory processes involve a conceptual shrinking process that threatens a theoretical degeneration. Any activity that is performed by the student, whether self-initiated or not, is defined as a self-regulatory strategy. If you push hard enough, self-regulation becomes more or less synonymous with any action performed by the student. In order to avoid confusion, I would like to extend the definition provided by Schunk and Zimmermann and define self-regulation as students' attempts to attain personal goals by systematically generating thoughts, actions, and feelings at the point of use, taking account of the local conditions. In my way of thinking, all the students inherently self-regulate their behavior in the classroom. I am not the first to take this position (see also Winne, 1995), but my reasons for putting forward this claim diverge a little from those of Winne. In my opinion, it is essential to have knowledge of the *personal* goals students are trying to achieve and avoid in order to understand how and why they regulate the self.

My argument is that self-regulation is intricately linked to an individual's goal structure. Students strive to obtain, retain, foster, and protect the goals they value. Personal goals are part of their theory of self and a key to our understanding of their

adaptation system. Several researchers have described the self-system and the goal-setting and goal-striving processes that emanate from it. I am most fascinated by the goal theory proposed by Carver and Scheier (2000) and Ford’s (1992) Living Systems framework. These goal theories take into account the individuals’ ideal self and their perception of the demands of the environment. These authors describe the self as a coherent system of principles or higher order goals. As illustrated in Fig. 2, higher order goals are abstract and located high up in the goal hierarchy. Carver and Scheier labeled these goals ‘I want to be... goals’ because they give meaning to a person’s life and specify the quality of all the personal goals he or she wants to pursue (located further down the hierarchy). ‘Be goals’ are abstract (e.g. I want to be respected) since they do not specify how a person wants to achieve them. Students’ personal goals are located at the next level down. These goals are more

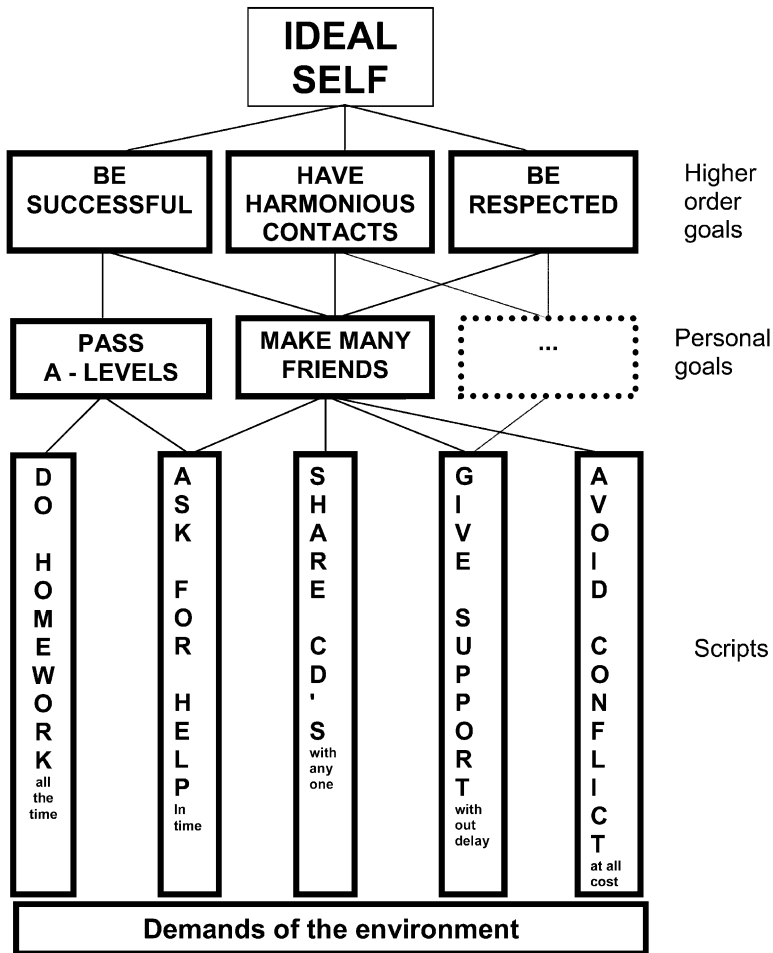


Fig. 2. Self-regulation is linked to the goal system. Adapted from Carver and Scheier (2000).



concrete in the sense that they specify the actions a person preferentially performs to achieve personally meaningful targets in their daily lives. In other words, personal goals are ‘action programs’ that refer to ‘do goals’ in the pursuit of desired consequences (approach goals) and the avoidance of undesired ones (avoidance goals). The details of these personal goals are left open, because they have to be adapted to the local context. Thus, lower level goals are more concrete than personal goals, because they refer to cognitively represented behavioral sequences of actions, called scripts. Scripts specify, for instance, how to do math homework, how to ask for help when one does not understand a task, how to avoid conflict when working in small groups, etc. As can be seen in Fig. 2, scripts are linked to one or more personal goals that are, in turn, linked to different higher order goals. As such, a network of goals is created that is unique to an individual student.

Talking about a network of goals suggests that any given higher order goal can be attained by a variety of personal goals and by many scripts. Similarly, a specific script may not only serve a particular personal goal but it may also serve many personal and higher order goals. Scripts gain in salience when they are attached to (congruent with) many higher order goals. Conflicts between goals can occur at all the levels. The theory of self, presented here, is very powerful, not only because it is a key to our understanding of students’ and teachers’ goal system, but also because it maps onto theories of motivation and self-regulation. As such, it is an excellent framework, or heuristic, for studying matches and mismatches between students’ perception of the complexity and demands of the learning environment and their attempts at self-regulation. In fact, the model presented in Fig. 2 allows me to explain why many learning contexts, including the so-called PLEs, do not invite students to use and develop their self-regulatory skills.

In order to create a PLE, it is important that researchers and teachers understand that self-regulation refers to two different aspects of students’ functioning. The first aspect describes self-regulation as an *aptitude*. More specifically, it describes how students connect an environmental demand to a personal goal in their goal structure (see lower part, Fig. 2). This meaning-generating act attaches value to the demand (e.g. a proposed learning activity) and motivates students to search for scripts in their repertoire that are effective to meet that demand (infusion of meaning to neutral events). The second aspect of self-regulation describes the *outcome* of a learning process. Students who are invited to extend their repertoire of scripts are in fact encouraged to experiment with new scripts, reflect on their use and appropriateness within one or more contexts (alone or with others), and link them to relevant personal goals. The linking process results in an extension of one’s repertoire of scripts (increasing choice) and the differentiation of existing scripts (updating one’s network).

Many researchers and teachers do not make a distinction between these complementary aspects of self-regulation. This hinders the selection of appropriate learning activities and an appropriate time-frame for self-regulation as an aptitude and an outcome to develop. By organizing learning situations in such a way that students are always encouraged to begin the learning process by generating learning goals from their own goal hierarchy, teachers allow their students to experience situational

meaningfulness. Research with the on-line motivation questionnaire (for review, see Boekaerts, 2001) and interest research (e.g. Krapp, 2002) demonstrated that attaching value to a learning task is an essential element of task engagement. However, catching the learners' interest is only half of the story, teachers also have to help them maintain it long enough to extend their existing scripts in such a way that they can regulate their own learning, now and in the future (self-regulation as an outcome).

### *3.2. Current theories of self-regulation harbor misconception*

Apart from the fact that our theories of self-regulation are not well focused, they also harbor misconceptions and I will call attention to the most threatening ones. Going back to our analogy of the rainforest, I would say that most researchers and teachers still believe that the curriculum, and by extension teacher-imposed curricular goals, is the only light source (resource) in the classroom. This misconception can be seen as a weaving fault in theories on self-regulated learning as they are currently used in educational research. Indeed, many researchers do not make a distinction between self-regulation and self-management. Yet, a great deal of student behavior that we see in the context of the classrooms should be labeled as 'compliance', 'self-control' or 'self-management', rather than self-regulation. Several researchers working in mainstream psychology have made this distinction. For example, Kuhl and Fuhrmann, 1998 argued that both self-regulation and self-control are beneficial to learning, in the sense that students who use either form of regulation in the classroom are protecting their learning intention from competing action tendencies. However, these authors hypothesized and found that individuals who use self-regulatory strategies (e.g. attention control, motivation control, volition control, and emotion control) to pursue personal goals activate the reward system, whereas those who use self-control to acquire scripts that they consider alien to their own goal structure basically activate the punishment system. The latter behavior is characterized by avoiding, neglecting, denying, and suppressing competing goals, even those that are congruent with their own higher order goals. Kehr, Bless, and Von Rosenstiel, 1999 tested Kuhl and Fuhrmann's hypotheses in a learning context and reported that indeed, self-regulating strategies are linked to positive emotions and serve a self-maintenance function. In contrast, self-control was linked to negative emotions and basically served a goal maintenance function (observed as intention control and over-control). Lemos (2002) also reported that pressure to comply with goals of others hinders personalization of goals and leads to over-control, rigid behavior, or under-controlled behavior, governed by one's urges. These research findings highlight the need to distinguish explicitly between students' goal striving for personal and imposed goals. Boekaerts and Niemivirta (2000) argued that it is important that educational researchers describe and explain students' goal-setting and goal-striving processes when they pursue personal goals (self-maintenance) and contrast these processes to the self-management, or self-control processes they use in order to maintain externally imposed goals (goal maintenance). The point I am making here is not that self-management strategies are never beneficial in the classroom, for they are beneficial on many occasions. Rather, my argument is that these control processes are

connected to negative emotions (the so-called punishment system). Abundant research has shown that negative emotions, such as anxiety, fear, irritation, shame, and guilt hinder learning, because they temporarily narrow the scope of attention, cognition, and action (Pekrun & Perry, 2002). In contrast, students, who engage in meaning-generated learning, experience positive affect. Recently, Fredrickson (2001) reviewed the literature on the effect that positive emotions, such as joy, contentment, satisfaction, anticipated pride, and challenge have on information processing. She suggested that positive emotions temporarily create a broader mind set and prompt individuals to expand the self, share information with others, and push themselves to their limits. Tugard, Man and Fredrickson (op cit., Fredrickson, 2001) even suggested that the experience of positive emotions during learning can undo the detrimental effect of negative emotions and fuels psychological resilience.

### *3.3. Current theories of self-regulation are incomplete*

With the reference to self-regulation as an aptitude and an outcome in mind, I now call attention to situations where students' academic and social goals are in conflict. My position is that learning in the classroom breeds social goals, and correspondingly, models of self-regulation that are exclusively based on regulating academic goals are not the most applicable. The promise of a truly comprehensive theory of students' adaptation system is hindered by a discernable gap in our knowledge about the relationship between how students set and master academic goals and how they set and strive for the social and well-being goals, and above all, how these different processes interact. To date, researchers and teachers have incomplete conceptions about the nature of students' goals. Granted, the influential work on goal orientation by Dweck (1996) and her followers informed teachers and researchers that the way students frame a curricular goal, as either an ego or a task goal, creates a typical meaningful system that affects their thoughts, feelings, and actions. However, this goal orientation framework focused on academic goals and on learning content. The social context and the social and well-being goals that students pursue in the context of the classroom were largely ignored, or treated as background variables. Researchers and teachers like to think that students treat academic goals as the figure and social goals as the ground. I am not so sure that this conception reflects reality as the following example shows.

Dave is a student in vocational school. I observed his behavior several times and interviewed him and his peers and teacher afterwards. On one such occasion, I noticed a conflict between Dave and one of his teachers. Apparently, Dave wanted to complete an academic task on time but he also felt the urge to communicate a personal message to his friend. The teacher noticed that Dave interrupted the academic activity he was engaged in and told him to stop chatting and continue with his work because time was running out. Note that in such a situation, Dave has two options. He can suppress his social goal and maintain the teacher's goal. Alternatively, he can pursue the social goal, risking a conflict with the teacher. Dave, cleverly, substituted his current social script (chatting) by another script (writing a personal note). In my opinion, this is a clear example of self-regulation, i.e. Dave

decided to maintain his self-system: he put the learning goal on hold, intending to return to it when an important message had been communicated. Remarkably, Dave's teacher told me afterwards that Dave lacked 'self-regulation'. Indeed, many teachers and researchers are inclined to define behavior that is not in line with their requests as 'lack of self-regulation', thus: (1) confusing self-regulation with self-management and (2) ignoring the interaction between socio-emotional goals and academic goals.

Evidently, learning and achievement goals cannot be understood when isolated from salient socio-emotional goals and from the motivation processes that guide the pursuit of interpersonal goals. If we want to describe and explain students' self-regulatory processes, we need to construct a comprehensive theory that incorporates self-regulation of academic and socio-emotional goals (see also Ryan & Deci, 2000).

#### **4. Some notes on socio-emotional goals**

Research on the regulation of social and well-being goals that students pursue in the context of the classroom is underdeveloped. A notable exception is the extensive work of Wentzel and colleagues (Wentzel, 1999) who have convinced even the toughest critics that social goals have wide applicability in a school context.

It is a fact that all learning that takes place at school is embedded in diverse social contexts and that students never passively accept these contexts. Students appraise the social context and attach meaning to the behavior of the teacher and their peers. This meaning-generating process creates a specific ecosystem within which self-regulation of academic and socio-emotional goals interact. In order to illustrate this point, I would like to share with you the results of a small-scale study I carried out in vocational school some years ago. I was interested in the dialogue pattern that students use in small groups. I observed group discussion during three consecutive lessons in different school subjects and noted that the same student who took the lead during the group work in economics patiently followed the instructions given by another student during the group work in a foreign language lesson. Interestingly, I noted a totally different interaction pattern during the group work in mathematics. I observed, for instance, that the boy who had dominated the discussion in the French lesson was interrupted frequently when he volunteered an opinion during the math problem-solving. His reaction to these frequent interruptions was very aggressive. When I interviewed the students afterwards and asked them to explain the observed interaction patterns, I learned that, on the whole, they were willing to accept another student's ideas and solutions, provided they considered that student as competent in the subject-matter area concerned. To go back again to our rainforest analogy, it seemed that the structure of the ecosystem created by group work was different for the different school subjects and that students knew very well who were the tall trees and who was located in the understorey in relation to a domain. This finding suggests that students who bask in the light in one subject-matter area find themselves in a shade-tolerant position in another subject-matter area and that interaction patterns in this kaleidoscope of ecosystems reflect students' beliefs about elements of that system. Collaborative learning seems to flourish, provided the students' salient socio-

emotional goals are not violated. Not much is known about the way students perceive collaborative learning contexts in relation to different school-subjects and to what extent they adapt their behavior to maintain the self (self-maintenance). In this respect, Gibbons and Gerrard (1991) reported that ‘understorey’ students are bored, angry, or disappointed in one context and satisfied and happy in the other. These students seem to be engaged in verbal reminders to themselves that they want to achieve their salient personal goals (e.g. I want to be respected, or I want to be treated fairly) and when these goals are threatened they take action to prevent it.

The information that is currently available from studies on collaborative learning about the effect of group composition on learning acquisition and the development of self-regulatory skills is not conclusive (cf. Roelofs, Van der Linden, & Erkens, 1999). We know next to nothing about the reasons why some groups function optimally whereas others fall apart or function as a collection of individuals. Researchers have speculated that one of the reasons why some groups do not function well is that the students lack social skills and that teachers lack knowledge about the conditions that affect learning with and from peers (Roelofs et al., 1999). Little is known about the social scripts that students bring to the classroom. Some studies (e.g. Barth & Park, 1993) informed us that students who come from families where parents did not enjoy higher education are ill prepared for group learning and need help to acquire social scripts to negotiate, share ideas, reach consensus, and resolve conflicts. Clearly, research about self-regulation in relation to socio-emotional goals is long overdue and information is urgently needed to advise teachers on how they can scaffold the use of social scripts that are necessary to interact optimally in ever-changing social-settings.

Our work at Leiden has attempted to identify the scripts that students use to reach salient socio-emotional goals. We set out to examine whether students’ pursuit of socio-emotional goals is context-dependent (Boekaerts, 1998). Taking Ford and Nicholl’s goal taxonomy as a starting point (op cit., Ford, 1992) it was theorized that students, who think that the social scripts they have access to are less appropriate in a particular context, judge the higher order goals to which these scripts are linked as less relevant in that context. For example, students who do not know how to reach consensus without creating a conflict may well avoid all situations in which they are expected to share ideas and solve problems together.

In an ongoing study that I am conducting together with De Koning, we found that students in vocational school list many socio-emotional goals among their most salient personal goals, such as being respected, being supportive, sticking to an agreement, being treated fairly, having harmonious contacts with peers, maintaining confidence in public, and getting valued for effort. These goals were salient in and out of school. Surprisingly, two interpersonal goals, namely ‘be ready to help anyone’ and have ‘harmonious contacts with peers’ were considered more valuable in and out of school context than at school. This finding suggests that teachers have not been successful in making schools places where young people infuse academic goals with social value (Day, 1999). Remarkably, two higher order goals that bear directly on academics, namely ‘learn new content/skills’ and ‘achieve well’ were more valu-

able to students in relation to their practical classes than in relation to academic subjects.

I would like to speculate that contexts, which the students themselves consider alien to their salient socio-emotional goals, will not invite them to activate the relevant social scripts that are attached to these goals. By contrast, contexts that the students themselves associate with salient socio-emotional goals put in motion self-regulatory processes to attain these goals. My point is that students who are invited to solve problems in a collaborative learning setting are, in fact, engaged in a double meaning-generating process. On one hand, they have to impose structure on the academic task and attach value to the learning assignment. This meaning-generating process activates relevant problem-solving strategies. On the other hand, they have to attach meaning to the context in which the academic task is embedded, both in terms of the social demands and the social support that is available. This second meaning-generating process will activate social scripts and impose structure on the interaction process. In other words, having access to academic scripts to solve problems in a collaborative setting is a necessary but not a sufficient condition to profit from the encounter. In order to flourish in so-called powerful, social learning environments, students need social self-regulation and self-regulated learning as twin-aptitudes. In addition, their goal setting and goal striving processes must focus on different outcomes, extending both their social and academic skills. This means that teachers must allow their students to practice, reflect on, and get feedback on this tandem self-regulation process.

## **5. Concluding remarks**

If we move toward the broader implications of the place of self-regulation in educational research and innovation, it becomes clear that we are dealing with a fundamental psychological construct. I argued that most current psychological models of self-regulation, and by implication the innovation programs that are based on these models, are not well focused, are incomplete, and harbor many misconceptions. I also argued that educational psychologists need to broaden the way they conceptualize the dynamics of learning contexts and find new ways to study the integrated processes that make up self-regulation in the context of the classroom. My main message was that students bring their own goals to the classroom and that these goals are the key to their adaptation system. Personal goals give meaning and organization, or in other words purpose, to a student's adaptation processes in the classroom. The scripts that are connected to these personal goals have value for them and function both as targets or sub-goals and as means to regulate their interpersonal and academic behavior in the classroom. Yet, the linkages between students' personal goals and between their social and academic scripts have been largely ignored in traditional classrooms. This brings me to the Achilles' heel of promoting self-regulation in the classroom, namely students' and teachers' difficulty to adapt to disturbance.

Remember that in the rainforest, disturbance is a key to vitality and diversity. A

gap in the canopy shakes the forest equilibrium to its foundations. Plants that have been in the understorey for a long time now get a chance to become mature, to flower and fruit, and ultimately reproduce. I have argued previously that most researchers and innovators are largely unaware of the disturbance that is currently being caused in the classrooms all over the world. The information transmission model is being pulled down, leaving large gaps in the teaching canopy. These gaps shake the school equilibrium till its foundations. Teaching methods and classroom organization forms that have endured years of minimal growth in the understorey all of a sudden get a chance to mature. The kaleidoscope of ecosystems being created by the use of these new teaching methods gives new direction and meaning to the learning and instruction processes. At the same time, these new methods introduce ambiguity, complexity, and conflict. Indeed, students may now pursue personal goals, including interpersonal ones, without interference from the teacher. They have the choice to take responsibility for their own learning in a subject-matter area or enjoy a free rider effect, when they want to conserve energy. For their part, teachers have the choice to chide their students for not flowering or fruiting all the time or to allow them decision latitude. Some students and teachers view these choice processes as a challenge, very much like the natural disturbance caused by the fall of one or more emergent trees in the rainforest. Other students and teachers consider the new teacher and student roles and the disturbance they cause as threatening, mainly because they compare modern teaching methods to a hurricane or earthquake, or to heavy machinery, which causes irreparable damage to the root mat of the rainforest (school). They are convinced that this situation will turn the school (rainforest) into a desert and they try to prevent this disaster by clinging to more familiar teaching and study methods.

In this essay, I made an attempt to establish the centrality of self-regulation as a psychological construct. Some of my comments were critical, but I did not intend to discredit the important work that has been done in this area. Rather, I argued that educational psychologists need to broaden the way they conceptualize the dynamics of learning contexts and find new ways to study the integrated processes that make up self-regulation in the classroom. The new model for self-regulation that we should build will necessarily be complex because it should focus on many aspects of students' and teachers' behavior while keeping track of the whole persons in context.

## References

- Ayensu, E. S. (1982). *Het Oerwoud*. Amsterdam: Elsevier.
- Barth, J. M., & Park, R. D. (1993). Parent-child relationship. Influences on children's transition to school. *Merritt-Palmer Quarterly*, 39, 173–195.
- Boekaerts, M. (1998). Coping in context: goal frustration and goal ambivalence in relation to academic and interpersonal goals. In E. Frydenberg (Ed.), *Learning to cope: Developing as a person in complex societies* (pp. 175–197). Oxford: Oxford University Press.
- Boekaerts, M. (2001). The online motivation questionnaire: a self-report instrument to assess students' context sensitivity. In P. R. Pintrich, & M. L. Maehr (Eds.), *Advances in motivation and achievement* (pp. 77–120). *New directions in measures and methods*, (Vol. 12). New York: JAI.
- Boekaerts, M., & Niemivirta, M. (2000). Self-regulated learning: finding a balance between learning goals

- and ego-protective goals. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation* (pp. 417–450). San Diego, CA: Academic Press.
- Carver, Ch. S., & Scheier, M. F. (2000). On the structure of behavioral self-regulation. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation* (pp. 41–84). San Diego, CA: Academic Press.
- Cognition and Technology Group at Vanderbilt (1992). The Jasper experiment: an exploration of issues in learning and instructional design. *Educational Technology Research and Development*, 40(1), 65–80.
- Collins, M., & Sayer, J. (Eds.). (1990). *The last rain forests*. London: Mitchell Beazley.
- Covington, M. V. (1992). *Making the grade: a self-worth perspective on motivation and school reform*. New York: Cambridge University Press.
- Day, Ch. (1999). *Developing teachers: The challenge of life long learning*. London: Palmer Press.
- Dweck, C. S. (1996). Implicit theories as organizers of goals and behavior. In P. M. Gollwitzer, & J. A. Bargh (Eds.), *The psychology of action* (pp. 69–90). New York: Guilford Press.
- Fredrickson, B. L. (2001). The role of positive emotions in positive psychology. *American Psychologist*, 56(3), 218–226.
- Ford, M. E. (1992). *Motivating humans: Goals, emotions, and personal agency beliefs*. London: Newbury Sage Publications.
- Gibbons, F. X., & Gerrard, M. (1991). Downward comparison and coping with threat. In J. Suls, & T. A. W. Wills (Eds.), *Social comparison: Contemporary theory and research* (pp. 317–345). Hillsdale, NJ: Lawrence Erlbaum.
- Kehr, H. M., Bless, P., & Von Rosenstiel, L. (1999). Self-regulation, self-control and management training transfer. *International Journal of Educational Research*, 31, 487–493 (Special issue).
- Krapp, A. (2002). Structural and dynamic aspects of interest development: theoretical considerations from an ontogenetic perspective. *Learning and Instruction*, 12(4), 383–409.
- Kuhl, J., & Fuhrmann, A. (1998). Decomposing self-regulation and self-control: The volitional components inventory. In J. Heckhausen, & C. S. Dweck (Eds.), *Motivation and self-regulation across the life span* (pp. 15–49). Cambridge: Cambridge University Press.
- Lemos, M. S. (2002). Social and emotional processes in the classroom setting: a goal approach (special issue). *Anxiety, Stress and Coping*, (Winter issue).
- Pekrun, R., & Perry, R. P. (2002). Positive emotions in education. In E. Frydenberg (Ed.), *Beyond coping: Meeting goals visions and challenges*. Oxford: Oxford University Press.
- Roelofs, E., Van der Linden, J., & Erkens, G. (1999). *Leren in dialoog: een discussie over samenwerkend leren in onderwijs en opleiding*. *Pedagogische Studiën*, 76(6), 7–34.
- Rollett, W. (2001). Effort avoidance motivation in achievement situations. Paper presented at the ninth Conference of the European Association of Learning and Instruction, Fribourg, Switzerland.
- Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, 55, 68–78.
- Schunk, D. H., & Zimmerman, B. J. (1994). *Self-regulation of learning and performance*. (p. IX). Hillsdale: Lawrence Erlbaum.
- Van Laar, C. (2001). Understanding the impact of disadvantage on academic achievement. In F. Salili, & R. Hoosain (Eds.), *Multicultural education: Issues, policies and practices*. Greenwich: CN Information Age Publishing.
- Wentzel, K. R. (1999). Social influence on school adjustment: commentary. *Educational Psychologist*, 34, 59–69.
- Winne, P. H. (1995). Inherent details in self-regulated learning. *Educational Psychologist*, 30(4), 173–187.

