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This chapter discusses how far the field of Self-Regulated Learning has come since the mid-1990s based on the work started by Paul Pintrich. The growth in understanding of why self-regulated learning is important to teaching and learning is outlined and Pintrich's model is presented and discussed.

Student Learning: From Teacher-Directed to Self-Regulation

Marilla D. Svinicki

In 1995 when *New Directions* issue No. 63, *Understanding Self-Regulated Learning*, was published, the issue editor, Paul Pintrich, was one of the leaders in studying how college students learn and what helps or hinders them during the process. His contributions to the field have been tremendous and very significant both theoretically and pragmatically. His untimely death from a stroke in 2003 robbed the field of someone who was destined to bring many insights into how students develop as self-regulated learners. This chapter is a tribute to how far the field has come since the mid-nineties, and much of the progress builds on and continues the work started by Pintrich. His work continued to be published posthumously and still leads the field. It is an honor to compile these ideas and present them to a new generation of faculty.

The Original Issue

In 1995 Pintrich laid out the components of self-regulation that were considered key to self-regulation, based on the research at that time. Those three keys have held up well across the years and continued investigations. I draw from his words here (Pintrich, 1995, p. 5):

1. “. . . self-regulated learners attempt to *control* their behavior, motivation and affect, and cognition.”
2. “. . . there is some *goal* the student is attempting to accomplish . . .”

3. “. . . *the individual student*—not someone else like a parent or teacher—must be in control of his actions.”

The key for Pintrich and others in distinguishing a self-regulated learner was in that personal control of their behavior and environment. As noted in the title to this chapter, the shift was being made from teacher control and responsibility for learning to learner control and personal responsibility. This sentiment was echoed in another very influential article published at that same time by Barr and Tagg (1995) that encouraged higher education to move from a teaching to a learning paradigm to enhance the effectiveness of higher education. That sentiment to move toward a learner-centered focus has since become a cornerstone of a lot of change in the way courses are taught and evaluated.

An important caveat to making this connection is that this paradigm shift was not exactly what the educational psychology field meant by self-regulation, however. In the learner-centered paradigm, the focus was definitely on the learner, but not to the extent that the learner exercised control. Rather, although the instruction followed the learners' progress and was centered on the learners' skills and needs and to some extent was guided by the learners, the instructional designer was still in control. The self-regulation movement took that focus on the learner one step further by locating the control and responsibility for learning squarely on the learners' shoulders.

For Pintrich (1995; Boekaerts, Pintrich, and Zeidner, 2000) and others working in learning psychology, this was an important distinction and was grounded in the rise of constructivist views of learning, which had replaced behaviorism and, to some extent, information-processing theory, as the dominant model of learning for that period. The constructivist model asserts that during learning, the learner “constructs” his or her understanding of the environment from his or her interactions with it rather than the environment creating new stimulus-response connections. As a consequence, each learner constructs a unique (though similar) view of the world and how it works. The learner truly is in charge of learning. The instructor simply helps the learner by providing a rich environment from which the learner can learn.

Another important theory of learning that was developing at the same time with complementary interpretations of learning was social cognitive theory, spearheaded by Bandura (1989). In social cognitive theory, a very large component is the idea of individual agency. The learner was viewed as the agent of change in his or her own behavior. This perspective gave strong theoretical support for the notion of self-regulation, not just in learning, but in all forms of human behavior.

Although self-regulation is more than constructivism or social cognitive theory, it definitely is consistent with the notion that it is the learner that is doing the work during learning. Self-regulation theory expanded on

that initial step in the learning process by attempting to specify what the learner could and does do to control that learning process. In self-regulation theory learners working toward their goals marshal the cognitive strategies available to them to make their learning more efficient and effective. Another key idea in self-regulation is that these monitoring and control skills can be enhanced through instruction. Learners can learn to monitor and manipulate the way they go about learning once they become aware of what they are doing. This is the goal of self-regulation training: to enhance learners' control over their own learning.

Harkening back to his original definition and adding a new wrinkle, Pintrich (2000) summarized the various theories of self-regulation at the time as control processes revolving around behavior, motivation and affect, and cognition, and adding control over the context. The behavior aspect of the processes involves monitoring what you are *doing* that results in progress toward the goal—things like self-observation of behavior, monitoring effort expenditure, seeking help when it is needed, and planning for action. The motivation and affect aspects involve actions such as setting goals that are reasonable and valuable, and monitoring emotional states to make sure that frustration or distractions do not sidetrack progress. The cognitive aspect involves setting goals, drawing on prior knowledge, awareness of and monitoring thinking, checking understanding, summarizing what has been working or not working, and, possibly most important of all, making appropriate attributions about what is driving outcomes. Control over the context involves being aware of the demands of the task, the resources available to assist learning, strategies for modifying the task or environment to facilitate learning, and monitoring changes in the context that might affect learning. In this particular summary of research and theory, Pintrich also charted four phases of self-regulated learning: (1) planning, (2) monitoring, (3) exercising control, and (4) reaction and reflection. At each of these four phases, there are appropriate actions for the four areas of control just described: (1) cognition, (2) motivation/affect, (3) behavior, and (4) context. This model of self-regulation is shown in summary in Figure 8.1.

The model could be used to help learners develop their learning effectiveness by adding the appropriate strategies for each to their repertoire. A much more detailed version of this model and Figure 8.1 is provided by Pintrich (2004). That article, published posthumously, provides suggestions

Figure 8.1. Pintrich (2004) Model of Phases and Areas for Self-Regulated Learning

<i>Phases/Areas for Regulation</i>	<i>Cognition</i>	<i>Motivation/Affect</i>	<i>Behavior</i>	<i>Context</i>
Planning				
Monitoring				
Control				
Reaction and Reflection				

about the kinds of actions that can occur in each of the cells of the model. In addition Pintrich discusses the development of instruments (in particular, his own Motivated Strategies for Learning Questionnaire [MSLQ]) to assess learners' use of those actions, which can help learners identify strengths and weaknesses, and take steps to remedy the latter. This instrument has since become a staple in research on learning. Although far from being the only model of self-regulation that was suggested over the years (see Boekaerts, Pintrich, and Zeidner, 2000; Zimmerman and Schunk, 2008), Pintrich's model had developed in depth and detail from the original description of it in the *New Directions* issue he edited in 1995.

Where Has Self-Regulation Gone Since Then?

The development of theory for self-regulated learning has not stood still since the publishing of the *New Directions* issue. For example, the questions being asked now have become far more sophisticated. In a recent review by Azevedo (2009) as part of a special issue on self-regulated learning, the author highlights some of the current questions that are facing those who try to study self-regulation and metacognition (that aspect of regulation that focuses on monitoring and controlling thinking).

Measuring Self-Regulation. There are, of course, always measurement questions about researching such an internal process. Even after all this time, there is not universal agreement on what constitutes self-regulated learning. Should one be studying macroprocesses, such as large-scale goal setting, or microprocesses, such as in the moment strategy use? In the same collection of articles, Schraw (2009) compares the instruments that exist for measuring student self-regulation and illustrates how they represent different perspectives on the subject. Without good measures it becomes difficult to reconcile research findings. One solution proposed by Schraw is to use all the measures simultaneously until their interrelationships can be teased out of the data. So, even after all this time, a task for theorists and researchers is to find a coherent definition that all can agree on to guide future studies. No one disagrees that self-regulation is an important phenomenon to study; there is just more sophisticated disagreement on what components are most potent in helping students learn.

Connecting with Other Theories. The concept of self-regulation has been joined by two important motivation theories to add weight to the importance of control by the learner. Motivation theory in the 1990s and beyond has focused on two interesting task characteristics that definitely influence an individual's self-regulation propensities. The first of these two motivation theories was proposed by Ryan and Deci (2000) and is referred to as self-determination theory. In this theory, individuals are said to be motivated by three basic needs: autonomy, competence, and relatedness. The latter two needs are not as relevant to self-regulation (but not irrelevant), but it is the idea of autonomy that matches up with theories of

self-regulation. Ryan and Deci suggested that individuals needed to feel as if they were in control of their world, that their actions were self-determined rather than determined by external forces. Those feelings of autonomy then lead to higher levels of motivation for a task, even if the task is not itself motivating. This assertion is obviously relevant to the idea of self-regulation. When students are able to exercise self-regulation, they feel more in control of their learning and hence more motivated to perform.

The second motivation theory that fits with self-regulation was proposed by Elliott and Dweck (1988), along with several other researchers working in the same time frame (Ames, 1992; Maehr and Midgley, 1991; Nicholls, 1984; for more details, see Pintrich and Schunk, 2002). These theories all propose that motivation and its expression are both influenced by the types of goals that learners are working toward and their orientation toward those goals. Specifically, they suggest that sometimes learners choose to work toward mastery of a task—described as learning as much as possible without worrying about errors or appearances. Sometimes learners are working under a performance orientation—described as the desire to appear competent or at least avoid looking incompetent. There are many variations on these themes, but the difference between working toward an internally evaluated goal versus an externally evaluated goal is probably the most prominent aspect of these theories. What is their importance for self-regulation? Because one of the aspects of self-regulation is the identification of goals and strategies for achieving them, an understanding of the attitudes and behaviors associated with different goal orientations is quite relevant. In general, mastery goal orientation is more associated with using quality learning strategies and greater motivation, whereas performance goal orientation is more associated with what in the literature is called “shallow learning” and tenuous motivation. Therefore, it would be beneficial to encourage students to adopt a mastery orientation in their self-regulation regimen by creating a safe environment for learning in which errors are treated as learning opportunities and students feel supported by their instructor and their peers.

An Increased Focus on Components.

Emotions. The second area where more has been learned about self-regulation involves an increased focus on components of the process, especially regulation of emotion and beliefs that support learning. The emotion area has begun to receive a great deal more attention in the educational literature in the last few years, but the awareness that emotion impacts learning has been in the literature for a long time. Most prominent has been the relationship between anxiety and learning. Known as the Yerkes Dodson effect (for the researchers who studied it), anxiety has a curvilinear relationship with arousal/anxiety. Very low levels of arousal/anxiety are associated with low levels of performance. Very high levels of anxiety are associated with low levels of performance also. And somewhere in the middle is the optimal level of arousal, which produces an optimal

level of performance. In educational settings this relationship is seen in conditions such as test anxiety, math anxiety, performance anxiety, and writer's block. Many practical methods for controlling anxiety have been developed over the years, several drawn from counseling theories. In the last twenty years theories and research on *academic* emotion and its impacts on learning have become more prominent (Pekrun, 1992). In general these theories and solutions are very similar in form to the kinds of strategies involved in self-regulation. For example, Bembenuity (2009) studied the interrelationship between self-regulated learning and text anxiety and the impact each has on student achievement, and suggests that instructors need to work with students on both types of regulation: cognitive as well as affective (anxiety). On the other hand, Turner and Husman (2008), in studying how students deal with the emotional aspects of learning, suggested that having an array of study and motivational strategies was helpful in mitigating the impact of stressful emotions. The implications might be that it is the knowledge that one *can* recognize emotional potholes and purposefully steer around them that reduces the anxiety associated with academic evaluation.

Beliefs About Learning. In addition to the array of cognitive strategies for regulating learning, the impact of beliefs about learning is being investigated for their impact on use of those strategies. Paulsen and Feldman (2007) studied the effects of four beliefs about learning on different types of self-regulation skills, including both cognitive strategies and behavioral strategies. They found that students with more sophisticated beliefs about learning (for example, "learning doesn't happen instantly," "knowledge is not a fixed commodity," and so on) tended also to use both cognitive and behavioral strategies more effectively. Of the beliefs they tested, beliefs about the fixed nature of ability had the biggest impact on self-regulation: the greater the belief in the possibility for changes in ability through effort, the more effective the use of self-regulation. The authors describe their findings like this:

... holding naive beliefs that one's ability to learn is fixed at birth and cannot be improved reduces the likelihood that a student will consider it worthwhile to engage in potentially educationally productive cognitive strategies in their learning—including both surface-level processing strategies (rehearsal) and deep-level processing strategies (elaboration, organization and metacognition). . . . (p. 382)

The authors report the same findings for the behaviorally based strategies, such as managing time and environment, seeking help from others, and regulating effort. An earlier study by Paulsen and Feldman (2005) reported similar effects on the use of motivational self-regulation. This phenomenon is discussed at length in Dweck (2006), who offers several examples of the belief about ability being fixed from birth versus changeable

through effort, making a compelling argument about the importance of beliefs in motivation and achievement.

Search for Interventions to Enhance Self-Regulated Learning.

Throughout the growth of the self-regulated learning literature, one conundrum has remained unresolved. If self-regulation is such a good skill, why don't more students take advantage of it? Actually, as Hofer, Yu, and Pintrich (1998) note, there isn't much known about how self-regulation is learned naturally, much less taught specifically. When asked, most of us just shrug our shoulders and say that we don't remember how we learned it. However, the hope that there is a way to induce self-regulation in learners remains high. Hofer, Yu, and Pintrich wrote in the early days of the movement that four questions needed to be addressed when planning for instruction in self-regulation: what to teach, whom to teach, whether to do it within the context of a content course or as a separate, stand-alone course, and finally how to encourage students to transfer what they learned to other settings. At the conclusion of their article, the authors admitted that they did not yet have an answer to those questions.

Unfortunately that still holds true for today: The answer isn't clear. However, progress is being made. For example, there seems to be fairly widespread agreement among practitioners that the "what" of instruction should include all aspects of self-regulation: cognitive, motivation/affective, behavior, and context management.

Help Seeking. Another body of research related to the what-to-teach question focuses on help seeking. How do we help students learn when it is appropriate to ask for help? An early aspect of this work by Karabenick and Knapp (1991) illustrated that an important component of this effort is the need to change the view of help seeking from a dependent behavior to a strategic behavior. They found in a series of studies that active learners were more likely to seek help when they needed it than students who were more passive in their use of learning strategies. Removing the stigma of dependency could remove one barrier to this self-regulation activity. Later research by the same team looked at the course variables that influenced help seeking and found that student perceptions of the structure of the class (is the emphasis on grades or learning?) as well as the real conditions within a class (such as size) impacted help-seeking (Karabenick, 2004). They conclude that the perception of need was a critical factor in convincing students to seek help.

Calibration of Understanding. The concept of perception of need raises another issue currently being studied in this literature: student calibration of need. By calibration, researchers mean the accuracy of a student's perception of the demands of a task, the skill and knowledge level he or she brings to the task, and the quality of his or her performance of the task (Bembenutty, 2009). From all aspects of self-regulation the ability to recognize the degree to which one is accurate in assessing progress is a critical step.

Feedback from Self and Others. One important source of learning of this skill is the kind of feedback that a student receives, which is another stream of research in the literature. Nicol and Macfarlane-Dick (2005) make a strong case for providing more frequent formative feedback, but add that it is more important to help the learner take control of the feedback process himself or herself. Until the learner is in control of feedback, it is hard to claim that he or she is self-regulating. Therefore, Nicol and Macfarlane-Dick (2005) offer seven practices of formative feedback that should improve its usefulness to a learner. Those practices in brief are:

1. Clarifying what “good” performance is by making goals and criteria clear
2. Facilitating the development of self-assessment through reflection activities embedded during learning
3. Providing high-quality diagnostic information about the student’s learning
4. Giving opportunities for dialogue about learning with peers or the instructor
5. Fostering positive motivation and self-efficacy
6. Providing opportunities to practice and improve
7. Providing information to the teacher about how to change teaching to help students

Technology That Provides Support. One of the new possibilities for developing self-regulation involves the use of technology. Although there were discussions about the similarity between hypermedia and individual thought processes even in the 1990s (Anderson, Corbett, Koedinger, and Pelletier, 1995), most of the advances in the use of computer-based tutors (intelligent tutors) have been in the decade between 2000 and 2009. For example, Winne and others (2006) report on the development of a software system that incorporates cognitive tools that are based on the concepts of self-regulation behaviors. By building into the instructional presentation tools that allow students to set goals, take notes, monitor their understanding, and other components of self-regulation, the authors are hoping to make these skills so easy to use that their use becomes an integral part of the student’s learning repertoire. The most prolific researcher in this area is Azevedo, who, with a series of collaborators, has provided a great deal of insight into the ability of hypermedia to scaffold self-regulation (Azevedo and Hadwin, 2005; Jacobson and Azevedo, 2008; Moos and Azevedo, 2008). This use of technology holds a great deal of promise in helping students to develop self-regulation skills.

What Does It All Mean for Self-Regulation?

As is the case in many educational areas, what we have learned most definitely since the first *New Directions* issue on self-regulation is that what

may have seemed fairly straightforward in 1995, isn't. The more we learn about self-regulation the more there is to learn. However, I believe it is safe to assert the following:

1. Self-regulation of learning has been demonstrated to improve performance; therefore, its development is worth both the student's and the instructor's time.
2. Self-regulation is a complex set of skills with many components. It involves more than the control over thinking and behavior; it also requires attention to motivation, emotions, and beliefs that affect the learner's perception of the possible.
3. Self-regulation can be learned, although it is difficult, which sometimes deters students from being willing to take the time to develop it.
4. Self-regulation is a skill learned through direct instruction paired with overt modeling by an instructor through the course of learning.
5. Providing self-regulation prompts in student assignments increases the probability that it will occur, but doesn't necessarily increase student independent use of the skills being prompted. The student may not be able to differentiate between the context and the skills.
6. Embedding training in self-regulation in real courses improves student motivation for it, but may hinder transfer. Teaching the skills in the context of a separate course can affect motivation and ability to use the skills in real contexts.

For now, it seems most reasonable for instructors to return to the model that Pintrich proposed in 2000, which is represented in Figure 8.1 in this chapter. The model still serves as a reasonable source of ideas about self-regulation for both teachers and students. The work since it was developed has been to refine the contents of the cells, but not to change the big picture about self-regulation that the model offers.

References

- Ames, C. "Classrooms: Goals, Structures, and Student Motivation." *Journal of Educational Psychology*, 1992, 84, 261–271.
- Anderson, J., Corbett, A., Koedinger, K., and Pelletier, R. "Cognitive Tutors: Lessons Learned." *Journal of the Learning Sciences*, 1995, 4(2), 167–207.
- Azevedo, R. "Theoretical, Conceptual, Methodological, and Instruction Issues in Research on Metacognition and Self-Regulated Learning: A Discussion." *Metacognition and Learning*, 2009, 4, 87–95.
- Azevedo, R., and Hadwin, A. "Scaffolding Self-Regulated Learning and Metacognition—Implications for the Design of Computer-Based Scaffolds." *Instructional Science*, 2005, 33, 367–379.
- Bandura, A. "Human Agency in Social Cognitive Theory." *The American Psychologist*, 1989, 44(9), 1175–1185.
- Barr, R., and Tagg, J. "From Teaching to Learning—A New Paradigm for Undergraduate Education." *Change*, 1995, 27(6), 12–14.

- Bembenutty, H. "Three Essential Components of College Teaching: Achievement Calibration, Self-Efficacy, and Self-Regulation." *College Student Journal, Part B*, 2009, 43(2), 562–570.
- Boekaerts, M., Pintrich, P., and Zeidner, M. *Handbook of Self-Regulation*. San Diego, CA: Academic Press, 2000.
- Dweck, C. *Mindset: The New Psychology of Success*. New York: Random House, 2006.
- Elliott, E., and Dweck, C. "Goals: An Approach to Motivation and Achievement." *Journal of Personality and Social Psychology*, 1988, 54, 5–12.
- Hofer, B., Yu, S., and Pintrich, P. "Teaching College Students to Be Self-Regulated Learners." In D. Schunk and B. D. Zimmerman (eds.), *Self-Regulated Learning: From Teaching to Self-Reflective Practice*. New York: Guilford Press, 1998, pp. 57–85.
- Jacobson, M., and Azevedo, R. "Advances in Scaffolding Learning with Hypertext and Hypermedia: Theoretical, Empirical, and Design Issues." *Educational Technology Research and Development*, 2008, 56, 1–3.
- Karabenick, S. "Perceived Achievement Goal Structure and College Student Help Seeking." *Journal of Educational Psychology*, 2004, 96(3), 569–581.
- Karabenick, S., and Knapp, J. "Relationship of Academic Help Seeking to the Use of Learning Strategies and Other Instrumental Achievement Behavior in College Students." *Journal of Educational Psychology*, 1991, 83(7), 221–230.
- Maehr, M., and Midgley, C. "Enhancing Student Motivation: A Schoolwide Approach." *Educational Psychologist*, 1991, 26, 399–427.
- Moos, D., and Azevedo, R. "Monitoring, Planning, and Self-Efficacy During Learning with Hypermedia: The Impact of Conceptual Scaffolds." *Computers in Human Behavior*, 2008, 24, 1686–1706.
- Nicol, D., and Macfarlane-Dick, D. "Formative Assessment and Self-Regulated Learning: A Model and Seven Principles of Good Feedback Practice." *Studies in Higher Education*, Vol. 31(2), 2005, 199–2005.
- Nicholls, J. "Achievement Motivation: Conceptions of Ability, Subjective Experience, Task Choice, and Performance." *Psychological Review*, 1984, 91, 328–346.
- Paulsen, M., and Feldman, K. "The Conditional and Interaction Effects of Epistemological Beliefs on the Self-Regulated Learning of College Students: Motivational Strategies." *Research in Higher Education*, 2005, 46(7), 731–768.
- Paulsen, M., and Feldman, K. "The Conditional and Interaction Effects of Epistemological Beliefs on the Self-Regulated Learning of College Students: Cognitive and Behavioral Strategies." *Research in Higher Education*, 2007, 48(3), 353–401.
- Pekrun, R. "The Impact of Emotions on Learning and Achievement: Towards a Theory of Cognitive/Motivational Mediators." *Applied Psychology: An International Review*, 1992, 41, 359–376.
- Pintrich, P. *Understanding Self-Regulated Learning*. New Directions for Teaching and Learning, no. 63. San Francisco: Jossey-Bass, 1995.
- Pintrich, P. "The Role of Goal Orientation in Self-Regulated Learning." In M. Boekaerts, P. Pintrich, and M. Zeidner (eds.), *Handbook of Self-Regulation*. San Diego, CA: Academic Press, 2000, pp. 452–500.
- Pintrich, P. "A Conceptual Framework for Assessing Motivation and Self-Regulated Learning in College Students." *Educational Psychology Review*, 2004, 16(4), 385–407.
- Pintrich, P., and Schunk, D. *Motivation in Education: Theory, Research, and Applications*. Upper Saddle River, N.J.: Merrill, Prentice Hall, 2002.
- Ryan, R., and Deci, E. "Intrinsic and Extrinsic Motivations: Classic Definitions and New Directions." *Contemporary Educational Psychology*, 2000, 25, 54–67.
- Schraw, G. "A Conceptual Analysis of Five Measures of Metacognitive Monitoring." *Metacognition and Learning*, 2009, 4, 33–45.
- Turner, J., and Husman, J. "Emotional and Cognitive Self-Regulation Following Academic Shame." *Journal of Advanced Academics*, 2008, 20(1), 138–173.

- Winne, P., Nesbit, J., Kumar, V., Hadwin, A., Lajoie, S., Azevedo, R., and Perry, N. "Supporting Self-Regulated Learning with Study Software: The Learning Kit Project." *Technology, Instruction, Cognition and Learning*, 2006, 3, 105–113.
- Zimmerman, B. J., and Schunk, D. H. (eds.). *Self-Regulated Learning and Academic Achievement: Theoretical Perspectives*. (2nd ed.) Mahwah, N.J.: Lawrence Erlbaum, 2008, pp. 153–189.

MARILLA D. SVINICKI is a professor of educational psychology at the University of Texas at Austin and former director of the Center for Teaching Effectiveness at the same institution. She has been active in faculty development since 1973 and served for two terms as the executive director of the POD Network.