# How a learner self-regulates reading comprehension: A case study for graduate level reading

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**Abstract:** The purpose of this study is to examine how a learner self-regulates learning while reading an academic text. In particular, the aim is not to generalize self-regulatory processes for any learning task, but to have an overall idea about how a learner self-regulates. In particular, Pintrich's SRL (self-regulated learning) model is used to find out whether the model was apparent in the learner's reading comprehension process. In this model, self-regulatory processes are categorized into 4 phases (forethought, monitoring, control and reflection), and each phase is divided into 4 areas of self-regulation (cognitive, motivational, behavioral and contextual). The data were collected through observation, videotaping and semi-structured interview. Purposeful sampling was used to obtain an in-depth understanding about how an experienced learner self-regulates and uses different kinds of strategies while reading an academic text. The result of the study revealed that all the phases in the model were apparent in the participant's reading comprehension task. However, it was difficult to decide on which strategies were belonging to monitoring or control phases. Actually, much of the empirical work also does not find much separation on these phases. This might be because these phases are reflecting the learner's thinking process.

**Key words:** self-regulation; reading comprehension; SRL models; case study

## 1. Introduction

Nowadays, learning is regarded as "an active, constructive process whereby learners set goals for their learning and then attempt to monitor, regulate and control their cognition, motivation and behavior, guided and constrained by their learning goals and the contextual features in the environment" (Pintrich, 2005, p. 453). For successful learning in school, students are required to continually adapt their knowledge and skills to new circumstances (Mohr, 2005), and become more self-regulated (Boekaerts, 1999). Self-regulation serves as a comprehensive framework for understanding how students become active agents of their own learning process (Pape, Bell & Yetkin, 2003). From a broad aspect, self-regulation can be defined as the ability to "develop knowledge, skills and attitudes which can be transferred from one learning context to another" (Boekaerts, 1999, p. 446). It includes "self-generated thoughts, feelings and actions that are planned and cyclically adapted to the attainment of personal goals" (Zimmerman, 2005, p. 14). Consequently, self-regulated learners can be described as proactive individuals "who know how to plan, control and evaluate their cognitive, motivational, affective, behavioral and contextual processes" (Torrano Montalvo & Gonzales Torres, 2004, p. 22).

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It is generally acknowledged that powerful learning environments advance the use of self-regulatory skills (Boekaerts, 1999). In order to promote students' success both in school and beyond, educators need to concentrate not only on developing students' academic skills, but also on improving the instructional settings and assisting students to become self-determined individuals (Konrad, Helf & Itoi, 2007). It is possible to develop students' self-regulatory skills by creating classroom context where students act as dynamic contributors to their learning (Schunk, 2000), know the possibilities and limitations of that environment (Boekaerts, 1997), and receive appropriate feedbacks for monitoring and adjusting their self-regulatory practices (Torrano Montalvo & Gonzales Torres, 2004). In recent studies, self-regulation has become a popular issue within educational psychology. Especially, understanding what SRL (self-regulated learning) is, which subcomponents it has, and how this capability develops, have become major topics in educational studies (Zimmerman, 2005). The purpose of this study was to examine how an individual self-regulates learning while reading an academic text. In particular, the goal of this study was to find out which processes of Pintrich's model was evident in a learner's reading comprehension task.

There are a number of different models offering alternative perspectives about how learning is self-regulated (e.g., Boekaerts, 1997, 1999; McCaslin & Hickey, 2001; Pintrich, 2000; Winne & Hadwin, 1998; Zimmerman, 1989). Although each model puts emphasis on different constructs about regulation and learning, they possess several features in common. In this study, the authors selected Pintrich's model mainly because it synthesizes the common frameworks of previous studies and offers a comprehensive model of SRL. Table 1 illustrates Pintrich's model of SRL. In this model, self-regulatory processes are categorized into 4 phases (planning, monitoring, control and reflection), and each phase is divided into 4 areas of self-regulation (cognitive, motivational, behavioral and contextual). As shown in Table 1, the forethought phase is the beginning of self-regulatory activities. Learners go through several planning and activation processes, such as goal setting, efficacy judgments, time and effort planning. Next, within the monitoring phase, learners figure out their state of cognition, motivation and behavior, as well as the changing task and content conditions. Then, within the control phase, learners develop different selection and adaptation strategies, such as increasing or decreasing effort, help-seeking, changing the atmosphere and structure of the learning environment. Finally, within the reaction and reflection phase, learners make judgments and evaluations about their task executions, the causes of successes or failures, assessments about the task and the learning environment as well as their choice of future behavior.

These 4 phases are organized in a general time-ordered sequence; however, this does not imply that they are hierarchically or linearly structured. Indeed, the phases can occur simultaneously forming multiple interactions among the different components. In addition, the 4 columns in Table 1 illustrate different areas for regulation. For instance, the cognitive column involves learners' prior content knowledge, prior strategic knowledge, and how they monitor, control and evaluate their cognition throughout the learning process. Besides, the motivation column includes learners' motivational beliefs about themselves in relation to the task, such as self-efficacy beliefs, interests and values for the task, as well as the strategies they develop to monitor, control and evaluate their motivation. In addition, the behavior column reveals learners' general effort spend on the task as well as persistence, help-seeking and cognitive behaviors. Finally, the context column reflects the regulation of different aspects of the task environment and the cultural context where the learning is taking place.

**Table 1  Phases and areas for SRL**

| Phases | Areas for regulation | | | |
|---|---|---|---|---|
| | Cognition | Motivation/Affect | Behavior | Context |
| (1) Forethought, planning and activation | Target goal setting Prior content knowledge activation Metacognitive knowledge activation | Goal orientation adoption Efficacy judgments Ease of learning judgments (EOLs); perceptions of task difficulty Task value activation Interest activation | (Time and effort planning) (Planning for observations of behavior) | (Perceptions of task) (Perceptions of context) |
| (2) Monitoring | Metacognitive awareness and monitoring of cognition (FOKs, JOLs) | Awareness and monitoring of motivation and affect | Awareness and monitoring of effort, time use, need for help Self-observation of behavior | Monitoring changing task and context conditions |
| (3) Control | Selection and adaptation of cognitive strategies for learning, thinking | Selection and adaptation of strategies for managing motivation and affect | Increase/decrease effort Persist, give up Help-seeking behavior | Change or renegotiate task Change or leave context |
| (4) Reaction and reflection | Cognitive judgments Attributions | Affective reactions Attributions | Choice behavior | Evaluation of task Evaluation of context |

Note: Pintrich, P. R. (2005). The role of goal orientation in self-regulated learning. In: Boekaerts, M., Pintrich, P. R. & Zeidner, M. (Eds.). *Handbook of self-regulation*. Burlington, MA: Elseiver Academic Press, 454.

## 2. Method

This study was designed as a case study whereby self-regulation processes were analyzed in a natural and holistic perspective. In particular, two qualitative methods were used for data analysis: think-aloud technique and trace methodology. Think-aloud technique is based on the verbalizing of thought processes and strategies, and it provides a useful source of data for examining an individual's inner thoughts during a learning activity (YANG, 2003). Besides, trace methodologies are derived from signs and observable indicators, such as personal comments, diagrams, footnotes, asterisks or summarizes, regarding cognitive processes that individuals perform while engaging in learning activities (Torrano Montalvo & Gonzales Torres, 2004). In this study, the authors asked the participant to think in a loud voice while reading an academic text. In this way, the authors tried to understand the participant's inner thoughts and figure out which phases were apparent in her reading process. In addition, the authors checked the traces she made on the reading text, such as the highlighted sentences, underlined words, and notes and questions written near the paragraphs.

The authors chose an experienced reader as a participant in order to obtain in-depth understanding about how an experienced learner self-regulates and uses different kinds of strategies while reading an academic text. She was a doctoral student studying in elementary teacher education program. Also, she had her master's degree in elementary mathematics teacher education. The academic text was chosen from mathematics education context, related with classroom environments that enrich students' mathematics learning and class interactions. The authors used observation, videotaping and semi-structured interview for data collection. Before observing the participant, the authors prepared a checklist including questions that reflect each area and phase of the Pintrich's model. During the observation, the authors used a think-aloud approach to follow the participant's self-regulation process, and filled the checklists individually. The observation took about 3 hours and was recorded in a video type. While the participant was reading the text, the authors did not interfere in the process. After the participant finished reading the text, the authors made an interview revealing the points in the checklist. The interview lasted for about 20 minutes. For data analysis, we transcribed the video tape, and analyzed the process using Pintrich's model. Then, the authors triangulated the data obtained from the checklist, transcription and interview. The data

produced generally convergent conclusions.

## 3. Data analysis

Pintrich's model of SRL is categorized into 4 phases (planning, monitoring, control and reflection), and each phase is divided into 4 areas of self-regulation (cognitive, motivational, behavioral and contextual). The authors analyzed the data following the phases of this model in order to get in-depth information about how the participant regulated her learning and to which extend her regulation reflected the processes mentioned in the Pintrich's model.

### 3.1 Forethought/planning and activation phase

During the observation, the authors gathered data from the participant's reflecting time and effort planning, task value activation, prior knowledge activation, target goal setting, perception of the task, interest activation and meta-cognitive knowledge activation with respect to the forethought, planning and activation phase. Before the participant started reading the article, she checked the number of pages and decided how many hours she needed to spend for reading the text. This might be an indication of time and effort planning for regulating behavior. Then, she wondered the date of publication of the article. In the interview, the authors asked the participant why she wondered the date and found that she thought that when the publications are up-to-date they include more valuable information. In addition, she looked how many authors contributed in the study. In the interview, she expressed that when there is more than one author, the study is more reliable. These can be signs of her task value activation for regulating motivation and affect.

After getting a general overview about the task, the participant read the title of the article and automatically remembered that she had idea about several concepts, such as "discourse analyzes" and "scaffolding" from a previous course she has taken. This can be a clue for her prior knowledge activation in cognitive regulation. In addition, knowing these concepts might have influenced her motivation in reading the text as well as increasing her self-efficacy for understanding the context. After reading the title of the text, she passed over the subtitles and tried to get an overall idea about the reading context. The authors interpreted this as her perception of the task in regulation of context. Then, she performed self-questioning activities, such as asking herself "How can we integrate instructional scaffolding in mathematics education?" and "How can the coding be implied in a qualitative study?". Actually, the answers of these questions were what she targeted to learn. She also indicated that "I wonder what kind information I can gather from this passage by asking these questions". Therefore, they were indicators of her target goal setting. After reading the subtitles, she exposed her feelings, such as "It seems interesting and exciting". This is also giving clue about her interest activation for regulating motivation and affect.

Before reading the article, she also preferred to analyze the abstract for getting an overall idea about the reading context. She said that "I prefer to read the abstract before reading the text, because I get more idea about what I am going to read about". This strategy can be actually an indication of her metacognitive knowledge activation. As an additional strategy, she started to prepare a summary paper including the title, date and authors of the article in order to remember the context. This can be a rehearsal strategy that she found important both for comprehending the passage and for using in her future studies.

### 3.2 Monitoring phase

In Pintrich's model, within the monitoring phase, learners figure out their state of cognition, motivation and behavior, as well as the changing task and content conditions. For example, learners can figure out their state of cognition through several cognitive monitoring activities, such as judgments of learning (Pintrich, 2005).

Judgments of learning may include a number of activities such as becoming aware of not understanding something read or heard, or asking oneself questions while trying to understand a reading passage (Pintrich, 2005). In this study, these kinds of learning judgments were observed very frequently. Especially, while the participant was trying to comprehend a text, she was rapidly asking herself questions like "What is the relationship?", "How does this happen?", "Why did this happen so?", and for each question she was trying to find reasonable answers. Moreover, when she had difficulty in comprehending the text, she honestly indicated that she did not understand. In such cases, she was reading the material again until she feels satisfied about her understanding.

Similar to monitoring cognition, learners can figure out their state of behavior through several time management and effort regulation activities (Pintrich, 2005). During the authors' observation, they did not detect any kind of attempts from the participant for adjusting her effort or time usage to fit the task. Actually, although she did not obviously show evidence for monitoring behavior, it was clear that she was always in charge of her learning. For example, before she started reading the article, she predicted to finish it nearly in 2 hours. By the time she completed half of the article, she spent approximately 1 hour. At this point, she decided to take a small break, and after 10 minutes break, she came back. Similarly, for the second half of the task, she took nearly 1 hour. When she completed the entire task, she indicated that it took nearly 2 hours as she predicted earlier. From this example, it is obvious that she was successfully monitoring her learning, not running out of time or showing a need for adjusting her effort level. This can indicate that she was self-observing her behaviors.

### 3.3 Control phase

The participant controlled and regulated various cognitive strategies for memory, learning and reasoning for controlling cognition. In general, she used traces and highlights, which may be an indication that she distinguished the information from content (Winnie & Hadwin, 1998). She underlined definitions, authors and some expressions that she found important and put new concepts into rectangle. It is generally seen that she tried to interpret what she understood from the paragraphs and had some notes beside them; for example, she wrote "definition of scaffolding", "supportive classroom management" and "math". She explained in the interview that she actually used some marks or symbols, such as question or exclamation marks when she found something important; but in this study, she only used the asterisk. After reading the article, she revealed the key words, for example, "co-regulation" and "discourse analysis", and put them at the top of the title. This can be an evidence of the cognitive strategies for memory.

While the participant did not understand the context at the beginning, she read it once more. She overviewed the previous title and traced the text, and then she tried to establish the relations with previous knowledge. Mainly, her learning strategies were based on self-questioning and finding answers to them. For example, she said, "How can the coding be implied in a qualitative study?" and she attempted to find the answer. These can indicate the cognitive strategies for learning. In a similar vein, she tried to criticize the ideas and make predictions about the context. For example, she compared the situations between Turkey and the other countries, and estimated the future education practice. These examples can suggest the cognitive strategies for reasoning.

Similar to monitoring cognition, the authors noticed that the participant could control her motivation. At the beginning, she could attempt to increase her motivation for learning and reading the article, but then she decreased the value of the article because she found some deficiency about presentation of the context and the article could not answer her expectations. While she believed that the article was useful for her, she continued to read the text. After refreshing break, she increased her motivation for completing the article and she did not quit the learning task. Parallel with behavioral control, general persistence is used as a sign of motivation (Pintrich, 2005). During

the authors' observation, they perceived that the participant persisted in reading the article. For instance, she spent a lot of time on understanding the table, although she found it disorganized. In general, the participant was successful in reading and comprehending the text. Therefore, she did not evaluate her cognitive, motivational and behavioral strategies. Also, she did not take decisions for possible future behaviors. While she thought that her strategies were sufficient for reading comprehension, she did not have any problems in completing the task.

### 3.4 Reaction and reflection phase

Finally, the participant attempted to sum up what she understood from the context after reading the article. She made evaluations about the article, and made descriptive and critical interpretation. For instance, in terms of descriptive interpretation, she interpreted the concepts which were mentioned before and tried to explain their relationships while she was summarizing the literature review. In terms of critical interpretation, the expressions were positive and negative; for example, she did not find the representations of coding remarkable. On the other hand, she thought the examples related to scaffolding interesting. All these general evaluations can indicate contextual reaction and reflection.

## 4. Discussion and conclusion

In this study, the authors used Pintrich's model of SRL to examine how an individual self-regulates her learning while reading a text. In particular, the goal of this study was to find out which processes of Pintrich's model was apparent in a learner's reading comprehension task. The authors selected Pintrich's model mainly because it synthesizes previous models and offers a common framework for research in SRL. Next, they decided on the learning task to be reading comprehension. Actually, reading a text is a routine activity in academic life, however, the authors tried to find out how self-regulation occurs while understanding a new text. Furthermore, they chose an experienced reader as the participant to observe different kinds of cognitive, motivational and behavioral strategies while she comprehends a text.

Self-regulation is not an easy task to be analyzed and interpreted. In this aspect, Pintrich's model is useful as it offers a taxonomy of different processes and components that can be involved in a SRL. Pintrich (2005) categorized self-regulatory processes into 4 phases, and divided each phase into 4 areas for regulation. In this study, the authors could observe most of the components of this model clearly. For example, in general, while comprehending the text, the participant regulated her cognition, motivation and behavior, as well as some part of the task. Also, while comprehending the academic material, she went through all of the 4 phases as suggested in the model. For instance, the participant performed several forethought, planning and activation activities, such as activating prior content knowledge and metacognitive knowledge, and planning time and effort for the task. Next, she implemented different kinds of monitoring and controlling activities, such as judgments of learning, self-observation of behavior, and persisting on finishing the task. As a final step, she made various judgments and evaluations regarding the comprehended text. In conclusion, all the processes of Pintrich's model were apparent in the participant's reading comprehension task.

However, it was somehow challenging to distinguish the participant's self-regulation for the second and third phase. The authors observed these 2 phases, monitoring and controlling, as compound to each other. It was hard to explicitly decide on which activities were belonging to monitoring process or controlling process. Indeed, Pintrich (2005) also suggested that "much of the empirical work on monitoring (phase 2), and control/regulation (phase 3) does not find much separation of these processes" (p. 455). It might be difficult to differentiate between these 2

phases due to the fact that they are reflecting an individual's thinking process. Finally, it is important to consider that for different learning tasks, it would be possible to observe different self-regulatory processes and activities. For example, instead of examining how self-regulation occurs in a reading comprehension task, if the authors examined how self-regulation takes place in a mathematical problem-solving task, they could gather different impressions about how different phases of regulation relate to different areas for regulation in Pintrich's model. Actually, the authors' aim is not to generalize self-regulatory processes for any learning task, but to look from a holistic perspective, and gather information about main ideas and an overall conception of SRL.

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