

Metacognition & Self-Regulated Learning

**EDUC 892
WikiBook Group Work**

Belinda, Ling, Dionysios

Organization and Structure

➤ Problems:

- The chapter structure wasn't functional; it didn't present specific reasoning; the order of the sections seemed random.
- Some sections were loosely connected to SRL and metacognition.
- Some headings were not meaningful or not really related to the contents.

➤ Solutions:

- Restructure the whole chapter.
- Delete the Irrelevant sections.
- Rewrite meaningful headings that signal the content of text passages.

➤ Theories

- The organization effect - principle 8 (Halpern, Graesser, & Hakel, 2007)
- The coherence effect - principle 9 (Halpern et al, 2007)
- The presentation design - LORI (Leacock, & Nesbit, 2007; Nesbit, Belfer, & Leacock, 2009).
- The manageable cognitive load - principle 15 (Halpern et al, 2007)

➤ Examples:

- How cultural differences influence learning in general

Examples

Chapter Structure - Original

Book Discussion Read Edit View history Search

Cognition and Instruction/Metacognition and Self-Regulated Learning

< Cognition and Instruction

Metacognition and Self-Regulated Learning [edit]

This chapter explores how learners take an active role in their own learning through self-regulation. We examine the stages of self-regulated learning (SRL) and how the ability to reflect on our own thinking, known as metacognition, facilitates these stages. We discuss the theory of metacognition and self-regulated learning and show how these fundamental cognitive processes drive learning in academic settings.

Contents [hide]

- 1 Metacognition and Self-Regulated Learning
 - 1.1 The Concept of Metacognition
 - 1.1.1 Definition of Metacognition
 - 1.1.2 Judgments of Learning
 - 1.1.3 Metacognition in Writing
 - 1.1.4 Metacognition in Reading
 - 1.1.5 Metacognition in Science Education
 - 1.1.6 Individual Differences in Metacognition
 - 1.2 The Concept of Self-Regulated Learning
 - 1.2.1 Self-Assessment:
 - 1.2.2 Goal Setting:
 - 1.2.3 Strategic Planning:
 - 1.2.4 Strategy Implementation:
 - 1.2.5 Strategy Monitoring:
 - 1.2.6 Outcome Evaluation:
 - 1.2.7 Other Self-regulated Terms
 - 1.3 Critical Review of Metacognition and Self-Regulated Learning
 - 1.3.1 Conceptual Confusion
 - 1.3.2 Cultural Differences
 - 1.3.3 Concept of Learning
 - 1.3.4 Concept of Learning in Relation to Cultural Differences
 - 1.4 Metacognition Through a Developmental Lens

Chapter Structure - New

Book Discussion Read Latest draft Edit View history More Search

Cognition and Instruction/Metacognition and Self-Regulated Learning

< Cognition and Instruction

The latest reviewed version was checked on 2 August 2016. There are 19 pending changes awaiting review. [review pending changes]

This chapter introduces the basic concepts of metacognition and self-regulated learning, explores how learners take an active role in their own learning through self-regulation. We examine the different models of self-regulated learning (SRL). We discuss the theory of metacognition and SRL and show how these fundamental cognitive processes drive learning in academic settings, as well as how to facilitate SRL in the classroom.

After reading this chapter, you will learn:

- The concept and major models of SRL.
- The concept of metacognition and its importance for students to reconstruct knowledge and manage their learning strategies.
- The major factors that affect SRL and metacognition.
- How learning analytics promote research in SRL.
- How technology can facilitate SRL.
- The four stages in the development of self-regulation, and the four types of SRL strategies.
- How to Facilitate and encourage SRL in the classroom.

Contents [hide]

- 1 Defining the Concepts
 - 1.1 Definition of Self-Regulated Learning
 - 1.2 Definition of Metacognition
 - 1.3 Other Related Concepts
 - 1.3.1 Judgments of Learning
 - 1.3.2 Self-Regulated Action
 - 1.3.3 Self-Assessment
 - 1.3.4 Purpose of Engagement
 - 1.3.5 Self Explanation
- 2 Models of Self-Regulated Learning
 - 2.1 Zimmerman's Cyclic SRL Model
 - 2.1.1 Forethought Phase
 - 2.1.2 Performance Phase
 - 2.1.3 Self Reflection Phase
 - 2.2 Boekaerts' Three-layered SRL Model
 - 2.3 Winne's Phase model of SRL
- 3 Issues and Topics of Research
 - 3.1 Cultural Differences in Self - Regulated Learning

Figure 1. Metacognition and Self-Regulated Learning

Missing Contents

- Problems:
 - Some aspects of metacognition and SRL were not covered adequately.
 - Some contents were absent from the chapter.
 - Some sections provided a single perspective about a specific topic in the domain.

- Solutions:
 - Add the necessary content to the inadequate sections.
 - Re-write three sections (individual contribution)
 - List the outlines of the missing parts (to be expanded by future students).

- Theories:
 - The content quality - LORI (Leacock et al,2007; Nesbit et al, 2009).
 - The cognitive flexibility - Principle 20 (Halpern et al, 2007)

- Examples:
 - Add learning objectives; add the missing elements to Zimmerman's SRL model
 - Rewrite: 3.3 [Learning analytics and SRL Research](#), 4.4 [Incorporating Technology](#), 4.5 [Facilitating and Encouraging SRL](#)
 - List two more SRL models

Grammar and Writing style

➤ Problems:

- ill grammar made sentences incomprehensible, didn't convey the intended meanings.
- Descriptions were not clear, concise.
- Writing style: redundant, inaccurate wording; non-unified; not for undergraduate level.

➤ Solutions:

- Correct the grammar errors.
- Replace the vague and meaningless sentences with legible and meaningful statements.

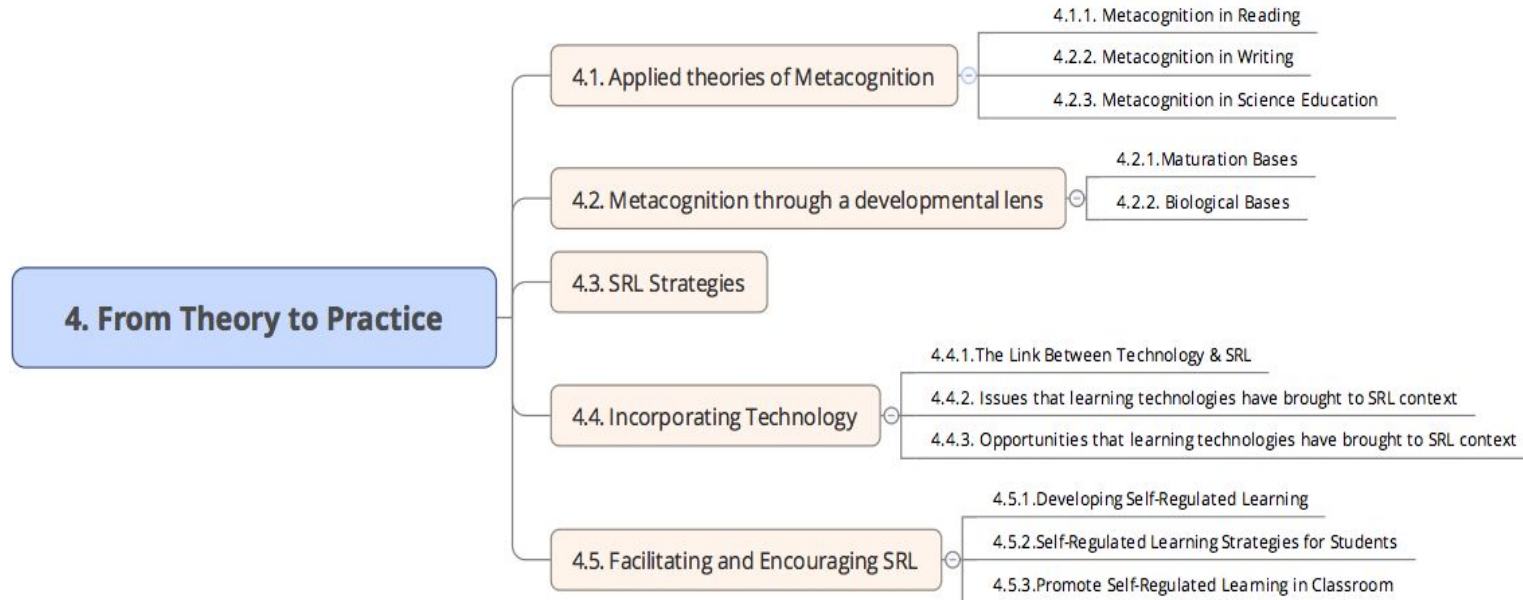
➤ Theories

- The presentation design - LORI (Leacock et al,2007; Nesbit et al, 2009)
- The explanation effects - Principle 17 (Halpern et al, 2007)

Content Layout and Presentation

- Problems:
 - Visualization: Information was delivered in single mode - lack pictorial presentation.
 - Large chunks of text, long paragraphs with a lot of information (increasing cognitive load).
- Solutions:
 - Dual channel presentation - add visual modalities: concept-maps, images, diagrams, and tables.
 - Provide extra video resources about metacognition and SRL.
 - Re-organize the content, separate long paragraphs into shorter ones.
- Theories
 - Dual code and multimedia effects - principle 3 (Halpern et al, 2007)
 - Perceptual-motor grounding - principle 2 (Halpern et al, 2007)
 - The presentation design - LORI (Nesbit et al, 2009)
- Graphics editing tools:
 - PHOTOSHOP, XMIND, PAGES, GIMP

Example: Concept - map



Example: Images, diagrams, and tables

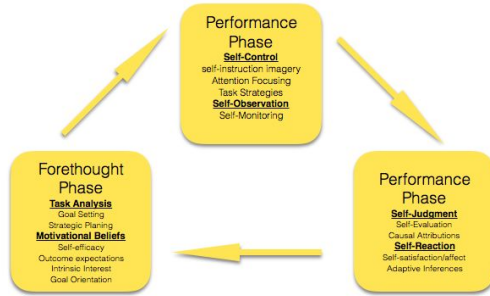


Figure 5. Zimmerman's Cyclic SRL Model

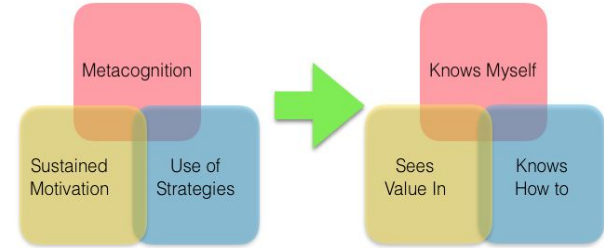


Image: Facets of SRL – concepts and corresponding actions.

Table 1. Type of SRL Strategies

Strategy Type	Description	Examples
<i>Cognitive strategies</i>	This type includes strategies to interact with the content.	Rehearsal, imagery, and organization of materials
<i>Metacognitive strategies</i>	This type includes strategies to organize, monitor and assess learning.	Task analysis, self-recording and self-experimenting
<i>Management strategies</i>	This type includes strategies used to create optimal learning conditions.	Time management, and help seeking
<i>Motivational strategies</i>	This type includes strategies to enhance and sustain student's motivation.	Formulation of a learning objective, development of a positive style of attribution.



Figure 7. Different Mind

Example: Image and screenshot

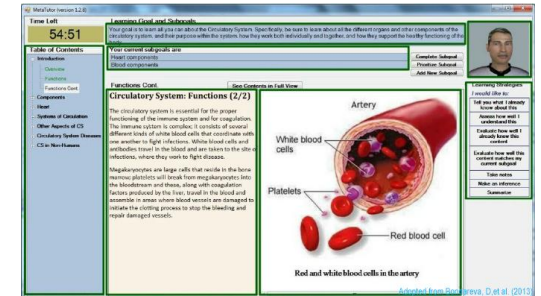
- Posterlet

There are studies that focus on investigating specific aspects of self-regulation strategies implemented by learners in computer-based learning environments. Cutumisu et al. (2015) in their study investigated the effectiveness of the strategies “seeking negative feedback” and “revision” to the learning outcomes, for primary school students using a learning application named Posterlet. This learning environment enables students to design posters for a school's Fun Fair. The learning objectives accommodated with this resource is for the students to learn principles and practices of effective poster design (optimal Graphical and textual characteristics). The component for capturing that specific learning behavior is embedded as a feature to the learning environment. In particular, the learners design a poster using the several tools provided by the environment and then receive feedback on their product, in the form of positive (I like...) or negative (I don't like...) comments by animal – agents (see also Figure 9). The system captures two learning choices made by the students, the number of times a student chose the negative feedback option and the number of times a student revised his / her product. The data collected were strictly numerical. No measurement of the quality of revisions (whether the students' revisions were directed by the feedback they received by the system) had been made during the study.^[47]



- Azevedo's MetaTutor

According to Khosravifar et al. (2013), MetaTutor is a research-based learning tool for improving students' academic performance. By applying different interactive and strategic intellectual techniques, students will better self-regulate their cognitive, affective, metacognition, and motivation in learning processes ^[69]. MetaTutor is designed to train and foster high school and college students' learning about complex and challenging science topics through hypermedia ^{[70][69][65]}. MetaTutor detects, models, traces, and fosters students' self-regulated learning about human bodily systems ^[71], which is mainly based on cognitive models of self-regulated learning. ^{[71][72]} All the users required by MetaTutor to complete the training session on SRL processes before they begin to explore and access the content on the hypermedia learning environment. There are four pedagogical agents in the hypermedia learning environment, which not only provide feedbacks to scaffold participants SRL skills and content understanding, but also help participants to navigate the system, guide them setting appropriate goals, monitor their progress toward their learning goals, and deploy SRL cognitive strategies such as summarizing and note-taking ^{[65][69][70]}.



Citation and Reference

- Problems:
 - Repeated reference list: there were multiple references to the same article or book.
 - Citations did not refer to the original article or study.
 - Citation conventions were not kept.
- Solutions:
 - Delete the repeated references
 - Replace the mismatched references with the proper ones.
 - Revise the citations to meet the conventions.
- Theories
 - APA conventions
 - WikiBook conventions
- Examples:
 - No reference to the specific pages for the exact citations

Summary

Problems	Solutions
Organization and structure	Restructure whole chapter; delete Irrelevant sections; rewrite meaningful headings.
Missing content	Add necessary content; rewrite some sections; list outlines of missing parts.
Grammar and writing style	Correct grammar errors; replace vague and meaningless sentences.
Content layout and presentation	Add visual modalities; provide extra video resources; separate long paragraphs.
Citation and reference	Delete repeated ones; replace mismatched ones; revise incorrect ones.

Cognition and Instruction/Metacognition and Self-Regulated Learning.

https://en.wikibooks.org/wiki/Cognition_and_Instruction/Metacognition_and_Self-Regulated_Learning

References

- Halpern, D. F., Graesser, A., & Hakel, M. (2007). 25 Learning principles to guide pedagogy and the design of learning environments. *Washington, DC: Association for Psychological Science*. Retrieved from <https://louisville.edu/ideastoaction/-/files/featured/halpern/25-principles.pdf>
- Leacock, T. L., & Nesbit, J. C. (2007). A Framework for Evaluating the Quality of Multimedia Learning Resources. *Educational Technology & Society*, 10 (2), 44-59.
- Mayer, R. E. (2001). *Multimedia learning*. NY: Cambridge University Press.
- Mayer, R. E. (2002). Cognitive Theory and the design of multimedia instruction: An example of the two-way street between cognition and instruction. *New Directions for Teaching & Learning*. 2002(89). 55-73. Wiley Periodicals, Inc. DOI: 10.1002/tl.47.
- Nesbit, J., Belfer, K., & Leacock, T. (2009). Learning objective review instrument (LORI) user manual. Retrieved from <http://www.transplantedgoose.net/gradstudies/educ892/LORI1.5.pdf>.
- Pass, F., & Kester, L. (2006). Learner and information characteristics in the design of powerful environments. *Applied Cognitive Psychology*, 20, 281-285.
- Reder, L. M., & Anderson, J. R. (1980). A comparison of texts and their summaries: Memorial consequences. *Journal of Verbal Learning and Verbal Behavior*, 19(2), 121-134.