Metacognition &

Self-Regulated Learning

EDUC 892
WikiBook Group Work

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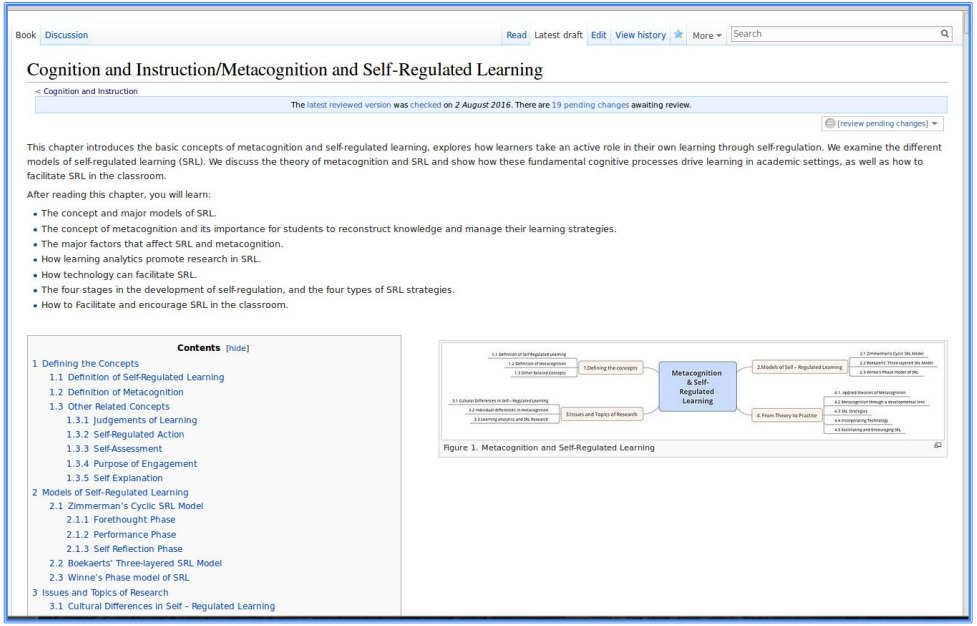
Organization and Structure

- 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

Chapter Structure - New



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 Zimmermen'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

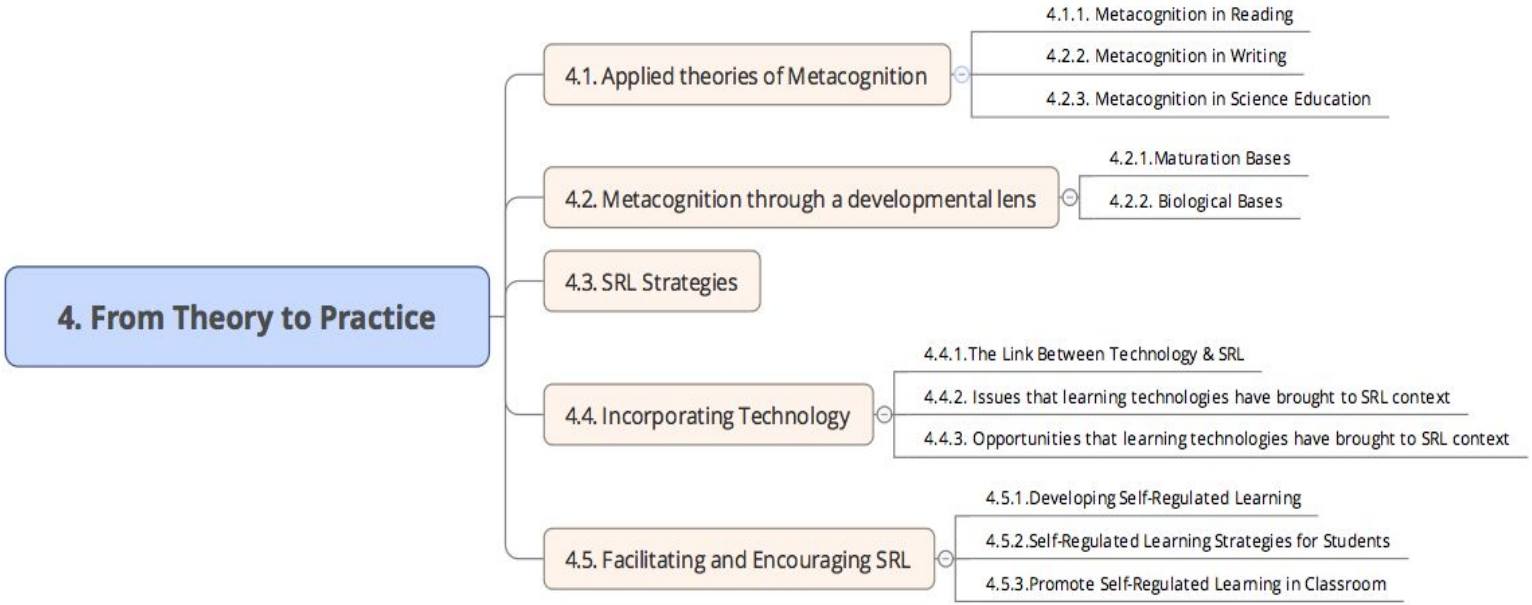
Grammar and Writing style

- 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

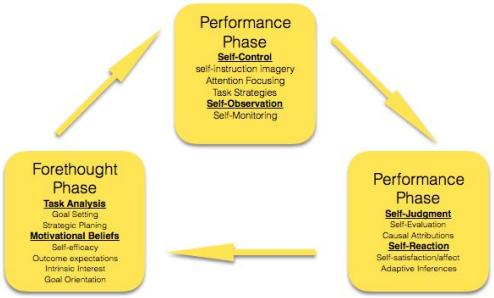


Figure 5. Zimmerman's Cyclic SRL Model

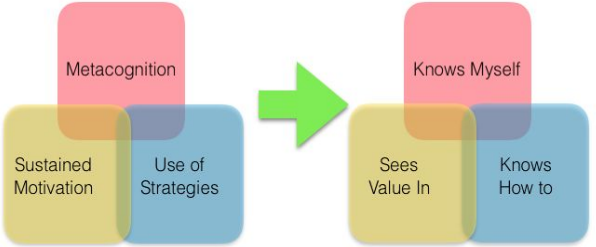


Image: Facets of SRL – concepts and corresponding actions.

Table 1. Type of SRL Strategies

Strategy Type	Description	Examples
Cognitive strategies	This type includes strategies to interact with the content.	Rehearsal, imagery, and organization of materials
Metacognitive strategies	This type includes strategies to organize, monitor and assess learning.	Task analysis, self-recording and self-experimenting
Management strategies	This type includes strategies used to create optimal learning conditions.	Time management, and help seeking
Motivational strategies	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

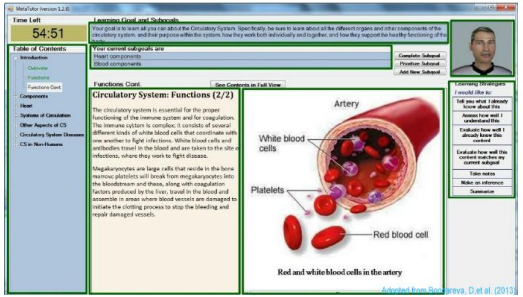
Example: Image and screenshot

- **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 [70], 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

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