A Heuristic Evaluative Framework for Mobile Self-Regulated Learning Design

Stephanie McNicol
Arizona State University

Additional Authors:
Scotty D. Craig, Ph.D., Russell J. Branaghan, Ph.D. & Rod D. Roscoe, Ph.D.
A Heuristic Evaluative Framework for Mobile Self-Regulated Learning Design

Rod D. Roscoe, Stephanie McNicol, Russell J. Branaghan, and Scotty D. Craig
Arizona State University
Overview

• **Defining SRL**
  • phases, strategies, and challenges

• **Designing SRL-supportive technologies**
  • Heuristic Evaluative Framework
  • The Platform Principle
  • The Support Principle

• **Example** (work in progress): PERLS
What is SRL?

• **Self-Regulated Learning**

  “iterative, metacognitive process in which learners make **plans**, take **action** to complete tasks, **monitor** their progress and outcomes, and **adapt** their plans and strategies to improve future performance and work”

• **strategies** are fundamental to SRL
Phases of SRL

Planning

Adapting

Monitoring

Enacting
(Many) Challenges for SRL

• Although “self” driven (by definition), novice learners often need substantial external assistance to self-regulate

  • may not know effective strategies; may not choose best strategies for the task

  • may not monitor themselves well; use poor cues and make inaccurate judgments

  • low motivation (e.g., interest, self-efficacy)
Encouraging SRL

• Evidence shows that self-regulated learners generally **outperform** less-regulated learners

• So... how can we **encourage** and **assist** learners to be more self-regulated?
  
  • i.e., to overcome challenges/obstacles of SRL

• **computer-based and mobile technologies**
  
  • how to **design** SRL technologies effectively?
  • how to **quickly evaluate** such technologies?
Heuristic Evaluative Framework

• How can designers, developers, researchers, and educators quickly assess how well an SRL technology (or design) supports SRL?

• usability assessment approach

  • outline core design principles
  • e.g., heuristic evaluation, document reviews, cognitive walkthroughs, etc.
  • evaluation templates and “checklists”
The Platform Principle

• SRL-supportive technologies should offer platforms (i.e., functions, features, and tools) for one or more “phase” of SRL: planning, enacting, monitoring, and adapting.

• Platforms enable specific tasks and strategies – allow learners to “do SRL”
Example Platforms

- **platforms for scheduling tasks and activities ("calendar tool")**
- **platforms for studying text ("ebook tool") and annotating the info ("notetaking tool")**
- **platforms for safely exploring complex systems and processes ("simulator tools")**
The Support Principle

- SRL-supportive technologies should **scaffold** learners’ **strategies**, **self-monitoring** and **self-assessment**, **motivation**, and **independence**

- platforms provide opportunity to engage in SRL strategies... but supports **help** learners make **best use** of those platforms
Supports for SRL

Instruction

Feedback

Prompts

Assessment
Heuristic Evaluative Framework

• How can designers, developers, researchers, and educators quickly assess how well an SRL technology (or design) supports SRL?

• We offer a systematic approach for mapping out whether and how systems address SRL platforms and supports:
  • what features and tools are offered?
  • how are they supported?
  • how are they documented?
Heuristic Evaluative Framework

- **multiple sources** can be consulted
  - reviews and walkthroughs of iterative versions; prototypes and wireframes
  - supporting documentation, such as “spec docs” and user manuals

- identify the occurrence and implementation for platforms and supports
<table>
<thead>
<tr>
<th>Platform?</th>
<th>Planning</th>
<th>Enacting</th>
<th>Monitoring</th>
<th>Adapting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Features, Functions, and Tools</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Support?</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Strategies</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assessment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Motivation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Independence</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Example from PERLS

• **PERvasive Learning System**
  - mobile learning system that guides learners through a self-regulated micro-learning model

• **Ongoing project** to evaluate, redesign, and update PERLS (i.e., motivation for this work)

• Document platforms and supports systematically as evaluation unfolds
Platform: Setting Goals (Planning)

The system includes tools for choosing topics and setting learning goals; setting goals at different levels (e.g., explore vs. master).
<table>
<thead>
<tr>
<th>Platform?</th>
<th>Planning</th>
<th>Enacting</th>
<th>Monitoring</th>
<th>Adapting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Features, Functions, and Tools</td>
<td>goal-setting</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Support?</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Strategies</td>
<td>multiple goal types</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assessment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Motivation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Independence</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Support: Motivation, Interest

supports **motivation** by allowing users to **choose topics**; provides **encouragement** (also a **platform for accessing content**)!
<table>
<thead>
<tr>
<th></th>
<th>Planning</th>
<th>Enacting</th>
<th>Monitoring</th>
<th>Adapting</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Platform?</strong></td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td><strong>Features, Functions, and Tools</strong></td>
<td>goal-setting</td>
<td>direct access to content via text/web (reading)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Support?</strong></td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td><strong>Strategies</strong></td>
<td>multiple goal types</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Assessment</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Motivation</strong></td>
<td></td>
<td>topic choice; encouragement</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Independence</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Conclusion

• systematic, comprehensive, grounded in SRL theory and principles
• fast and efficient
• enables “map” of how a system currently addresses SRL platforms and supports, thus revealing gaps and opportunities
  • e.g. gap: a great platform but poor support
Thank you! Questions?