


Active Learning on the Inside

Linda B. Nilson, Ph.D.

Director, Office of Teaching Effectiveness and Innovation
Clemson University, 448 Brackett Hall
Clemson, SC 29634 USA | 864.656.4542
clemson.edu/OTEI | nilson@clemson.edu |  lindabnilson

Outcomes for You

You will be able to:

- Explain what self-regulated learning (SRL) is and how it enhances student learning.
- Induce your students to practice SRL.
- Adapt and integrate SRL activities and assignments in your courses.

Most students think ...

- Learning “happens” or doesn’t happen to them.
- Learning in college should be easy.
- If it’s not happening:
 - It’s the instructor’s fault, OR
 - It’s hopeless; they weren’t born with the talent.

The Antidote: Self-Regulated Learning

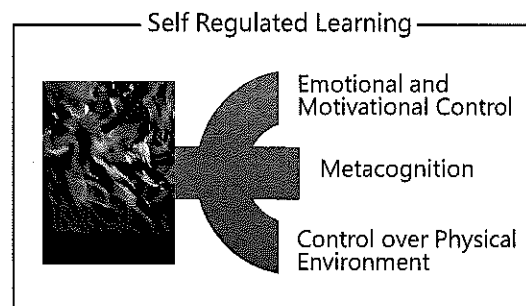
= the conscious planning,
monitoring, and evaluation of
one’s learning in order to
maximise it.

Multi-dimensional, multi-stage
process

Bandura's Findings



Dimensions of SRL




The Learner's Questions


Bases of activities and assignments

| | Metacognition | Meta-emotional | Environmental |
|--|---------------|----------------|---------------|
| BEFORE Planning or Forethought | | | |
| DURING Self-Monitoring or Performance/Volition Control | | | |
| AFTER Self-Evaluation or Self-Reflection | | | |


Benefits to Students




Learning → performance




More and deeper thinking




Conscious focus on learning



Self-Efficacy



Motivation



Professionalism & Adult Success

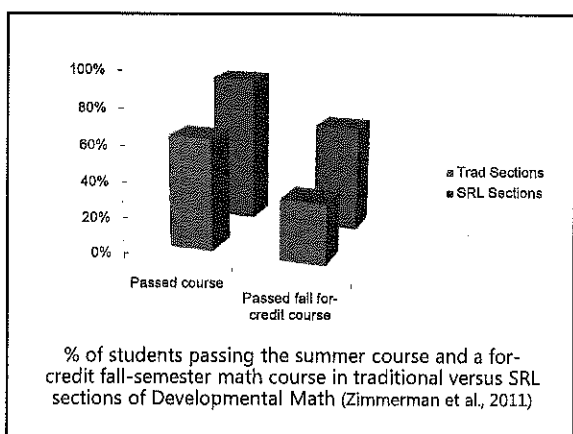
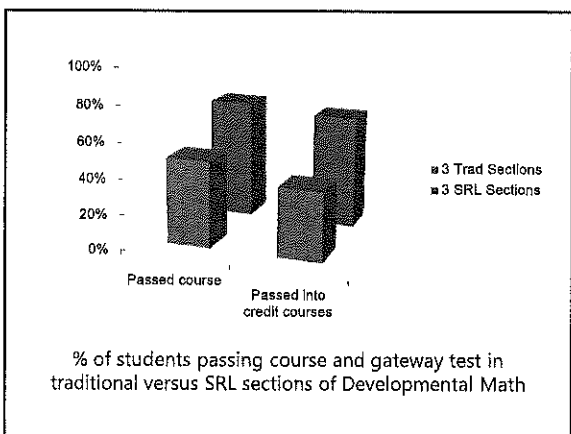
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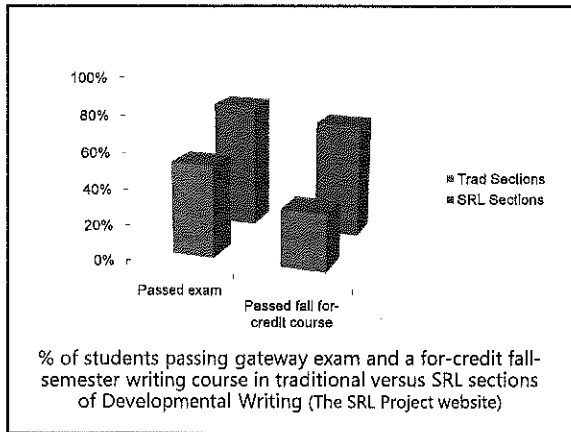
Hattie's (2009) meta-meta-analysis

- teacher clarity - effect size of .75
- getting feedback - .73
- spaced v. mass practice - .71
- **metacognitive strategies** - .69
 - > mastery learning, cooperative learning, time on task, computer-assisted instruction, and teaching students test-taking strategies

Rolf, Scharff, & Hodge, 2012

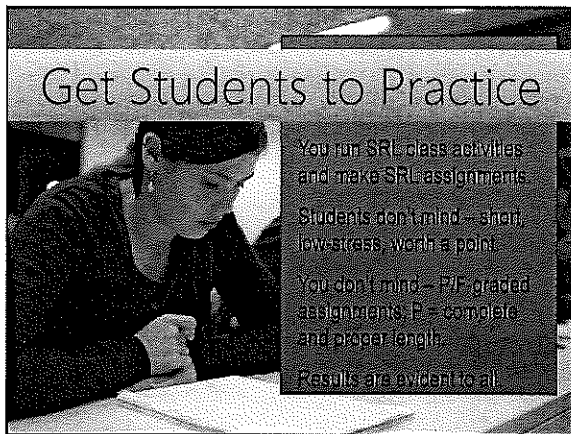
- 2 groups of math students w/ JITT assign'ts: Treatment group received 1) explanation for JITT and 2) 3 SRL reflection forms to complete on their learning process.
- Treatment group
 - Performed better on final
 - Expressed greater appreciation of JITT
 - More likely to answer optional JITT questions (because students saw the value).





SRL Activity #1

Awareness-raising one-minute paper:
How does the material you've heard so far connect or conflict with your prior knowledge, beliefs, or values?



SRL Activities & Assignments

- Start of Course
- Readings (videos, podcasts) "wrappers"
- Live Lectures " "
- Assignments " " ("meta-assignments")
- Quizzes & Exams " "
- End of Course

Start of Course

- Reading and discussion on "learning" and "thinking"
- Goal-setting - "How I earned an A in this course"

Start of Course *continued*

- Reflective writing on nature of subject matter (to activate students' prior knowledge & reveal misconceptions) *
- Essay questions on course material *
- Knowledge survey *

* *Best to repeat at end of course*

Knowledge Surveys

- Series of questions/tasks covering knowledge and skills in a course or unit (from old exams, outcomes, exercises, etc.)
- Answer = *students' perceived ability* to answer question/perform task
- Activate prior knowledge, reveals misconceptions, generates interest

Knowledge Surveys *Examples of Answers*

- a) I do not understand the question, I am not familiar with the terminology, *or* I doubt I can answer the question well enough to earn a passing grade.
- b) I understand the question and 1) I think I can answer at least half of it correctly, *or* 2) I think I can find the correct answer within 30 seconds.

- c) I am confident that I can answer the question well enough to earn a passing grade, but no higher.
- d) I am confident that I can answer the question well enough to earn a high grade.

Examples of Answers continued

OR

- a) Very confident
- b) Somewhat confident
- c) Not sure
- d) Not at all confident

Not a good measure of learning

Students *overestimate* their abilities and knowledge (except possibly the best students) when they know the *least*.

- Less likely in STEM and health/medical fields because students more likely know they don't understand terminology.

What will you do to enhance students' self-regulated learning skills at the start of your courses?

SRL Activity #2

Take the role of a student listening to a lecture: Write down all the important points that you can recall and any questions you have.

Live Lecture Wrappers

- Periodic free-recall (self-testing)
 - Students listen to lecture for 10-20 mins. , then close notebook when instructor pauses.
 - They write down all important points they can recall and their questions, leaving space between the points.
 - They pair up to compare, fill in, and fine-tune their free-recall notes.

- "Conceptests" - At end of mini-lecture, display conceptual or application multiple choice item on content.
 1. Students "click in" their answers.
 2. They try to convince neighbors of their answer.
 3. Repeat step 1. \Rightarrow more correct answers and higher confidence

- Active listening checks
 1. Students to listen to 10-20-min lecture for key points (may take notes).
 2. They write 3 most important points and turn in.
 3. Instructor reveals 3 most important points.
 4. Students self-assess their listening.Improve listening skills: 1st \rightarrow 3rd time: 45% \rightarrow 75% of students get points correct (Lovett, 2008)

- Minute paper(s) on day's class:
 - Most useful or valuable thing you learned?
 - Most important point or central concept?
 - Most surprising/unexpected idea?
 - What idea(s) struck you as things you could/ should put into practice now?
 - What stands out in your mind?
 - What helped or hindered your understanding?
 - How does the content connect or conflict with your prior knowledge, beliefs, or values?

Reading (Video, Podcast) Wrappers

- Reflective study Qs
 - most important concepts/principles and what you *don't* understand clearly
 - comparisons/connections to prior learning, preconceptions, existing knowledge framework, other courses
 - affective reactions: attitudes, values, beliefs, emotions
 - one-minute paper(s)

- Self-Testing: Read * Recall * Review

1. *Read*, then put away book and notes.
2. *Recall* all you can, and recite it aloud or write it down.
3. *Review*, for what you misunderstood or forgot.

- Better immediate and delayed free recall of fact-based passages than rereading and equal to note-taking
- Less time than note taking
- Gives learner "deliberate practice," "retrieval practice," and "elaborative rehearsal."

(McDaniel, Howard, & Einstein, 2009; Roediger & Karpicke, 2006)

- Visual Study Tools (also lecture wrappers)

- Students actively integrate and structure knowledge themselves – *how we remember long-term*.
- Lower cognitive load, less working memory, and fewer cognitive transformations than text ➡ better reading comprehension, deeper learning/conceptual understanding
- Cue text
- Cross-cultural

Common Types of Visuals

- Concept map, mind map – hierarchy
- Flowchart – sequence of events or operations; causal or procedural process
- Concept circle diagram – relationships among concepts, categories, equations, topics, principles
- Matrix – classify or compare-and-contrast
- Cycle

What will you do to enhance your students' self-regulated learning skills in readings and lectures?

Meta-Assignments

- Math-Based Problems
 - "Think aloud" to prepare students for HW: Partners "talk through" and guide solutions.
 - Learn from problem w/ incorrect answer: Write an error analysis and solve similar problem.

- Papers & Projects – as applicable:
 - Process followed
 - Reasoning used to solve problem
 - Self-evaluation of work, progress
 - Paraphrase of your written feedback
 - Revision goals, strategies
 - Value of assignment; skills gained, improved
 - Advice on assignment for next year's students

- Experiential Learning: S-L, field work, simulation, role play (Grade with rubric.)
 - Connect to course outcomes and content
 - Explain and evaluate goals, strategies, decisions, responses to other players.
 - Evaluate goal achievement, strategies, performance.

Post-Quiz & Exam Wrappers

- Reflection on graded exam (Barkley, 2009)
 1. Compare your expected and actual performance.
 2. How do you feel about your grade?
 3. How many hours you studied – enough?
 4. How did you study?
 5. Why did you lose points? Any patterns?
 6. For next exam, set goal and design study game plan. What will you do differently?

- Students re-solve incorrect or similar problems & write out correct strategy.
- "Test Autopsy"– error analysis form; OK to add reflection probes

| Question Profile | | | Reason Answer Was Incorrect | | | |
|------------------|-------------|------------------|-----------------------------|---------------------|-------------------------|----------------|
| Question Missed | Points Lost | Type of Question | Carelessness | Unfamiliar Material | Misinterpreted Question | Did not finish |
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What will you do to enhance your students' self-regulated learning skills in assignments and exams?

End-of-Course

- Letter to next cohort of students
 - How to succeed in course
 - Highlights of course content and skills
- Research paper: "future uses" of course skills and knowledge (Grade with rubric.)
- Self-evaluation "How I earned an A – or not"

- Re-write and/or correct errors, poor reasoning, misconceptions, etc. in first-week essays (final exam; grade with rubric.)
- Repeat reflective writing on nature of subject matter and compare/correct.
- Repeat knowledge survey and compare.

SRL Activity #3

Review-and-evaluate one-minute paper:
Answer *one* of these two probes (your choice) about this workshop:

- What is (are) the most useful or valuable thing(s) you learned?
- What is (are) the most surprising or unexpected idea(s) you encountered?

Questions That Self-Regulated Learners Ask Themselves

(adapted from Schraw 1998 and Tanner 2012)

| | Metacognition (also Elaborative Rehearsal) | Meta-emotional | Environmental |
|---|---|--|--|
| Planning before a learning or performance task (task analysis) | <p>What kind of a task is this?</p> <p>What is my goal? How will I know I have reached it?</p> <p>What do I already know about the topic?</p> <p>What additional information, if any, will I need?</p> <p>What strategies should I use? (actively listening, taking notes, outlining, visually representing the material, occasionally self-quizzing, reviewing, or writing a summary)</p> <p>What strengths can I bring to the task?</p> <p>What are my weaknesses and how can I make up for them?</p> | <p>How interested and motivated am I to do the task, and how can I increase my interest and motivation if they are low?</p> <p>What's the value or relevance of what I'll be learning?</p> <p>How confident am I in my ability to learn this material? If not very, how can I increase my belief in my ability to learn it, without becoming over-confident? What similar tasks can I recall doing well in the past?</p> | <p>What is the best environment for the task that I can create?</p> <p>Am I in a good physical place and position to do this task?</p> <p>Is the temperature right for me? How about the background sounds?</p> <p>Have I had enough sleep? Have I had the right amount of coffee today?</p> <p>Have I put potential distractions far, far away?</p> <p>How much time and what resources will I need? Are these resources handy?</p> |
| Monitoring during a learning or performance task | <p>Am I sure I know what I am doing?</p> <p>Does my approach to the task make sense?</p> <p>Am I making good progress toward my goal?</p> <p>How focused am I? Am I getting tired? If so, how can I keep myself focused and alert?</p> | <p>If my interest and motivation are sagging, how is what I'm learning relevant to my experience or my future?</p> <p>What material is challenging what</p> | <p>Should I try another environment to see if it works better?</p> <p>How about another physical position?</p> <p>How are the temperature and background sounds</p> |

| | | | |
|---|---|--|--|
| | <p>How well are my strategies working?</p> <p>What changes in approach or strategies should I make, if any?</p> <p>What material is the most important?</p> <p>What material am I having trouble understanding?</p> <p>How does what I am learning relate to what I already know?</p> <p>How is my thinking on the topic changing?</p> | <p>I've thought about the subject? Am I resisting it?</p> <p>Am I starting to get discouraged or give up? Am I thinking I'm just no good at this subject? How can I change this negative thinking? What similar tasks can I recall doing well in the past?</p> | <p>working out?</p> <p>Am I staying away from distractions? If not, I have to get further away from them.</p> <p>Do I need a short break to refresh my mind and body?</p> |
| <p>Evaluating after a learning or performance task</p> | <p>How well did I achieve my goal or master what I set out to learn?</p> <p>What can I recall and what do I need to review?</p> <p>What were the most important points I learned?</p> <p>Can I see and organize the interrelationships among them?</p> <p>What am I still having trouble understanding?</p> <p>What questions do I have to ask my instructor?</p> <p>How does what I learned relate to other things I've been learning or have experienced?</p> <p>How has my thinking on the topic changed?</p> <p>Which approaches and strategies worked well?</p> <p>Which didn't?</p> <p>What do I need to do differently next time I take on a similar task?</p> | <p>How am I reacting emotionally to my evaluation of my learning?</p> <p>Being pleased reinforces a learner's motivation and other positive emotions she generated about the material and her ability to learn it.</p> <p>Being disappointed may lead either to improving her learning strategies or her defensively withdrawing her energy from task.</p> <p>This last reaction in turn undermines the positive emotions needed to begin the next learning or performance task.</p> | <p>How well did I avoid distractions and stay on task?</p> <p>If not that well, how can I avoid distractions more effectively in the future?</p> <p>Do I need to experiment more with different physical factors to find the best working environment and break schedule for myself?</p> |

Reading and Discussion on “Learning” and “Thinking”

Learning (Your First Job), by Robert Leamson (2002) at <http://www.udel.edu/CIS/106/iaydin/07F/misc/firstJob.pdf> 12-page essay on the brain biology of learning; the difference between “understanding” and “remembering”; how to listen actively to a lecture and take notes; how to develop an interest in a subject; how to use out-of-class time productively; the difference between “knowledge” and “information” and how to use the former to make sense out of the latter; and how to prepare for and take exams. Leamson gives wise, research-based advice on how to study and effectively drives home the point that learning involves work and effort for all students but can be very rewarding.

Learning to Learn, by Karl R. Wirth and Dexter Perkins (2008) at <http://www.macalester.edu/geology/wirth/learning.pdf> 29-page manuscript (longer and more advanced than Leamson’s) on the failure of traditional teaching; the shift from teaching to learning; the student learning needs for the 21st century; thinking and learning in the cognitive, affective, and psychomotor domains; Fink’s categories of significant learning; Kolb’s learning cycle; the changes in the brain associated with learning; Perry’s stages of intellectual development; Baxter Magolda’s levels of intellectual development; Paul and Elder’s elements of critical thinking; metacognition; Felder’s learning style dimensions; the behavioral dimensions of grades; and the contrasting characteristics of successful, average, and struggling students.

If you assign this kind of reading, leave time for in-class **discussion** the date it is due. The discussion may start out with some recall (recitation) questions that warm up students’ minds to the material, but a good *discussion* is an exchange of experiences and viewpoints, so it relies on asking questions with multiple correct answers, like these:

- What was the most important insight you gained from the reading?
- What surprised you most in the reading?
- What did you already know?
- Have you been taught how to learn before? Where? What did you learn about learning?
- What will you do differently during a lecture, if anything, given what you read?
- How will you prepare differently for exams, given what you read?
- Can you think of other good learning practices that the reading didn’t mention?
- Did you identify with any of Kolb’s learning styles? Which one or ones? (Wirth & Perkins, 2008 only)
- Which one of Perry’s stages of intellectual development did you identify with? (Wirth & Perkins, 2008 only)

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