Why does my learner perform poorly on exams?

How faculty can use Self-Regulated Learning Theory to diagnose the specific learner problems and implement appropriate solutions

Sarah Cipriano, MD, MPH, MS

Janet Lindsley, PhD

Objectives

- Describe self-regulated learning theory and how it is can be used to identify the proximal causes of learner underachievement
- Apply a self-regulated learning-derived microanalytic procedure for diagnosing and assisting “struggling” health science learners
- Recognize that learners who have underlying issues with one or more of the 7 D’s (Distraction, Deprivation, Disease, Depression, Drugs, Disability, Disorders) will need additional help

The Seven D's
Underlying issues to consider

Distraction
(family, social, financial)

Deprivation
(sleep-OSA, relational)

Disease
(thyroid, etc.)

Depression
(affective disorders)

Drugs
(alcohol, narcotics, amphetamines)

Disability
(learning disability, ADHD)

Disorders
(personality disorders)

Lucey CR, Boote R. Working with problem residents: A systematic approach. In Holmboe E and Hawkins R, eds. Practical Guide to the Evaluation of Clinical Competence. Philiadephia, PA: Mosby Elsevier; 2008: 201 - 215

What is Self-regulation

- Self-generated thoughts, feelings, and actions that are planned and cyclically adapted to the attainment of personal goals
- 3 phases

Zimmerman BJ. Attaining self-regulation: A social-cognitive perspective. Handbook of self-regulation, M Boekaerts, P Pintrich, M Zeidner. Academic Press, Orlando, FL 2000; 13–39

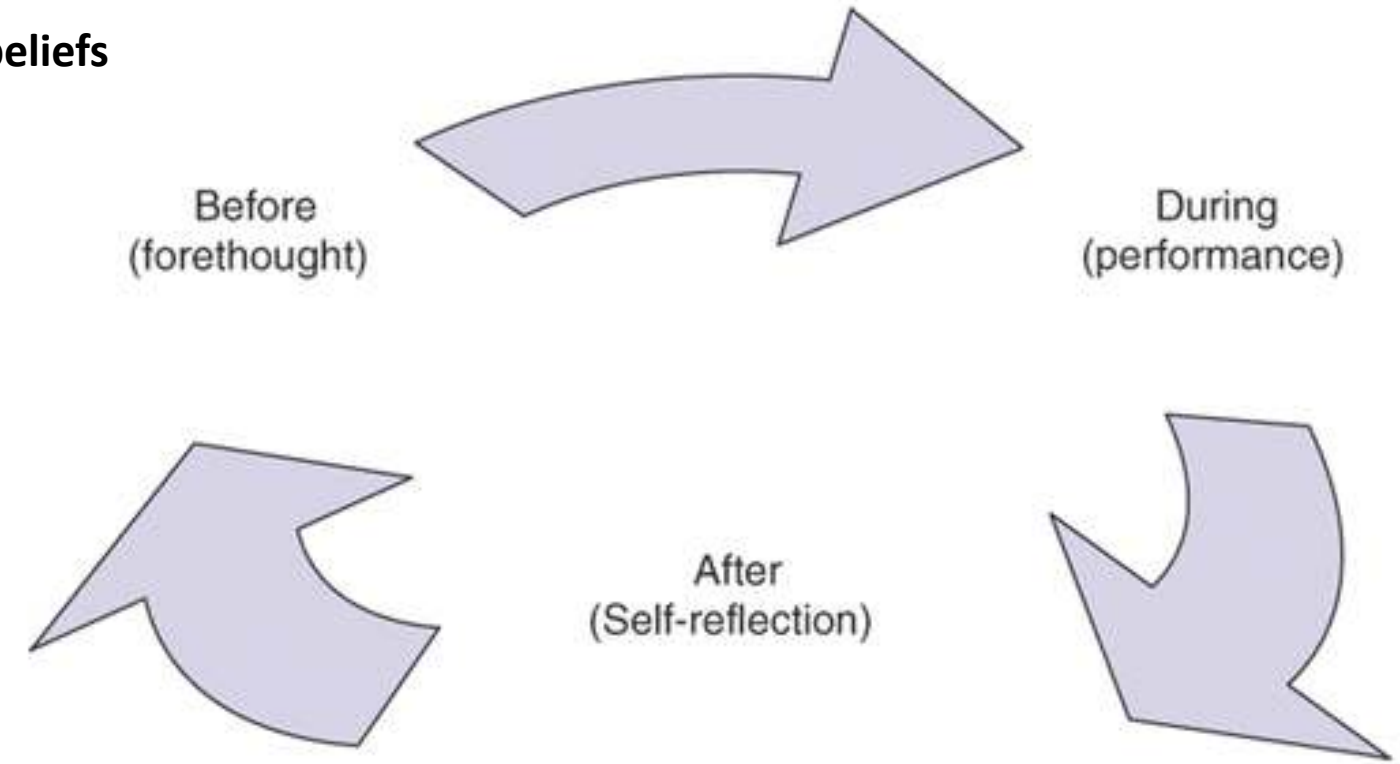
Sandars J, Cleary TJ. Self-regulation theory: applications to medical education: AMEE Guide No. 58. *Med Teach*. 2011;33(11):875-886. doi:10.3109/0142159X.2011.595434

Proactively 'prepare'

Self-motivation beliefs

Control behaviors and thoughts

Skillfully observe when learning is successful/not



Self-evaluate

Make attributions to specific processes/strategies

Sandars J, Cleary TJ. Self-regulation theory: applications to medical education: AMEE Guide No. 58. *Med Teach*. 2011;33(11):875-886. doi:10.3109/0142159X.2011.595434

Self-regulated learning microanalytic questions

- Expert, nonexpert, and novice
- Experts set more specific free-throw goals
- Attributed their failure to faulty specific techniques
- Adopted more specific, technique-oriented strategies

Timothy J. Cleary & Barry J. Zimmerman (2001) Self-Regulation Differences during Athletic Practice by Experts, Non-Experts, and Novices, Journal of Applied Sport Psychology, 13:2, 185-206, DOI: 10.1080/10413200175314988

Self-regulated learning microanalytic questions

- Venipuncture, 7 medical students
- Microanalytic assessment
- Successful
  - Strategic thinking across forethought, performance and self-reflection processes
- Strugglers
  - Outcome-oriented thinking across all three phases

Cleary TJ, SandarsJ. Assessing self-regulatory processes during clinical skill performance: A pilot study. *Medical teacher.* 2011;33(7):e368-e374.

Microanalytic protocol to measure self-regulated learning

- Self-Regulated Learning-Microanalytic Assessment and Training (SRL-MAT)
- Structured interview targeting self-regulated learning subprocesses
  - Using the question review form (QRF)
- Open-ended responses
- Conducted in the context of an authentic task

Cleary et al. Assessing Self-Regulation as a cyclical, context-specific phenomenon: an overview and analysis of RSL microanalytic protocols. Education Research International (2012); 19

Andrews MA, Kelly WF, DeZee KJ. Why Does This Learner Perform Poorly on Tests? Using Self-Regulated Learning Theory to Diagnose the Problem and Implement Solutions. *Acad Med*. 2018;93(4):612-615.

Using the Question Review Form (QRF)

- Uninterrupted think-aloud exercise
- Present test question with answers covered
- Learner reads through stem
  - Answers 1-6 - What is the disease script?
- Uncover the stem question- learning objective
  - Answers 7-10 - What is the objective? Predict the answer
- Uncover the answer choices
  - Answers 11-17 - Were you right? Why/not? What's next?
- Confidence assessments throughout
  - Assesses self-monitoring, calibration accuracy

Scripts (schema)

- Organized cluster of prior knowledge that can be applied to the situation at hand
- Useful for organizing large amounts of information for ease of storage/retrieval

Charlin B, Tardif J, Boshuizen HP. Scripts and medical diagnostic knowledge: theory and applications for clinical reasoning instruction and research. Acad Med 2000 Feb; 75(2):182-90.

Struggling Test-taker Subtypes

1. Lack of script recognition
2. Lack of script specificity
3. Premature closure
4. Underconfidence
5. Incorrect causal attribution
6. Inappropriate adaptive inferences
7. Isolated knowledge deficit

Struggling test-taker: Amy

- https://www.youtube.com/watch?v=PiEsywpnDCg&feature=youtu.be

1. **What went wrong? (Problem list)**

2. **Diagnose the struggling test-taker subtype**
    1. Lack of script recognition
    2. Lack of script specificity
    3. Premature closure
    4. Underconfidence
    5. Incorrect causal attribution
    6. Inappropriate adaptive inferences
    7. Isolated knowledge deficit

3. **Propose specific treatment strategies**

What went wrong? (Problem list)

- Inefficient use of time (essentially read question twice)
- No interior commentary/interpretation
- No prioritization of clinical information
- Uses answer choices to get ideas about what disease might be

Struggling Learner Type #1: Lack of script recognition

- Struggles to identify diagnosis presented in clinical stem
- Reads/rereads without prioritizing and interpreting information in terms of the most likely script
- May use the answers to get a sense of what the case is about.
- Can't answer # 1-4 on the QRF

1. What is the most likely diagnosis for this patient?

_____

2. What is the specific clinical scenario and/or severity of this disease?
For example, if the disease was depression, the specific clinical scenario could be: uncomplicated depression, depression in the elderly, depression with history of mania, depression with suicidal ideation, etc.).

_____

3. What factor(s) support your diagnosis?

_____

4. What factor(s), if any, are inconsistent with your diagnosis?

Struggling Test-taker Subtypes

1. Lack of script recognition — Amy
2. Lack of script specificity
3. Premature closure
4. Underconfidence
5. Incorrect causal attribution
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7. Isolated knowledge deficit

Treatment strategies: Strategic Planning

- Learn to engage question in terms of illness script from the START
- Sort clinical information based on the script and change scripts if needed to accommodate new info
- Study disease in context of clinical presentation

Struggling test-taker: Charlie

- https://www.youtube.com/watch?v=v_maDtOXE8Y&feature=youtu.be (start at 1:11)

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Struggling Learner Type #4: Underconfidence/self-monitoring

- The learner knows the correct answer, but subsequently talks himself out of it when he sees the answer choices
- Usually occurs when learner has been discouraged by repeated failures/suboptimal performances
- Can also result from "over-thinking" the question
- Evident during the "think aloud" QRF #5-6, 8,9, 13

13. How confident are you in your answer now?

Not at all confident	Slightly confident	Moderately confident	Quite confident	Extremely confident

Treatment strategies

- Use test taking worksheet to collect data on:
  - Accuracy of initial answer
  - Confidence BEFORE looking at choices
- Compare mean confidence scores on questions answered correctly vs. incorrectly
- Over time, learner recalibrates their confidence

Struggling test-taker Matthew:

- https://www.youtube.com/watch?v=WP0i3bOHCfA&feature=youtu.be

1. **What went wrong? (Problem list)**

2. **Diagnose the struggling test-taker subtype**
    1. Lack of script recognition
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    5. Incorrect causal attribution
    6. Inappropriate adaptive inferences
    7. Isolated knowledge deficit

3. **Propose specific treatment strategies**

Struggling Learner Type #5: Incorrect causal attribution

- Learner **unable** to articulate why he/she got the answer right or wrong (QRF#15) – thus is at a loss for next steps
- May be able to complete hundreds of questions per study session, but doesn't try to understand correct or incorrect answers
- Correct answers may reflect lucky guessing, key word recognition without understanding or knowledge of the underlying disease

14. Did you answer this test question correctly?

15. Why or why not? Whether or not you got the item correct, what else do you need to learn?

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Treatment strategy:

- When doing practice questions, the learner should examine each answer and explain why it is right or wrong
  - Bonus: Think in which situations would the wrong answers be right (compare/contrast)?
- Cut back on the number of questions per session to allow for the in-depth review required above

Take Home Points

- Self-Regulated Learning-Microanalytic Assessment and Training (SRL-MAT)
  - Foundation in self-regulated learning theory
  - Individualized treatment plans
  - Relative ease of implementation
- A practical and effective tool for faculty who aren’t learning specialists