

SRL Strategies in Developmental Courses



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SRL: Self-Regulated Learning



- Self-Regulated Learning (SRL) is a theory of educational psychology built on cognitive science.

The Self-Regulated Learning Model



- We use the SRL model in teaching developmental math at City Tech.
- We help students become more aware of their learning process.



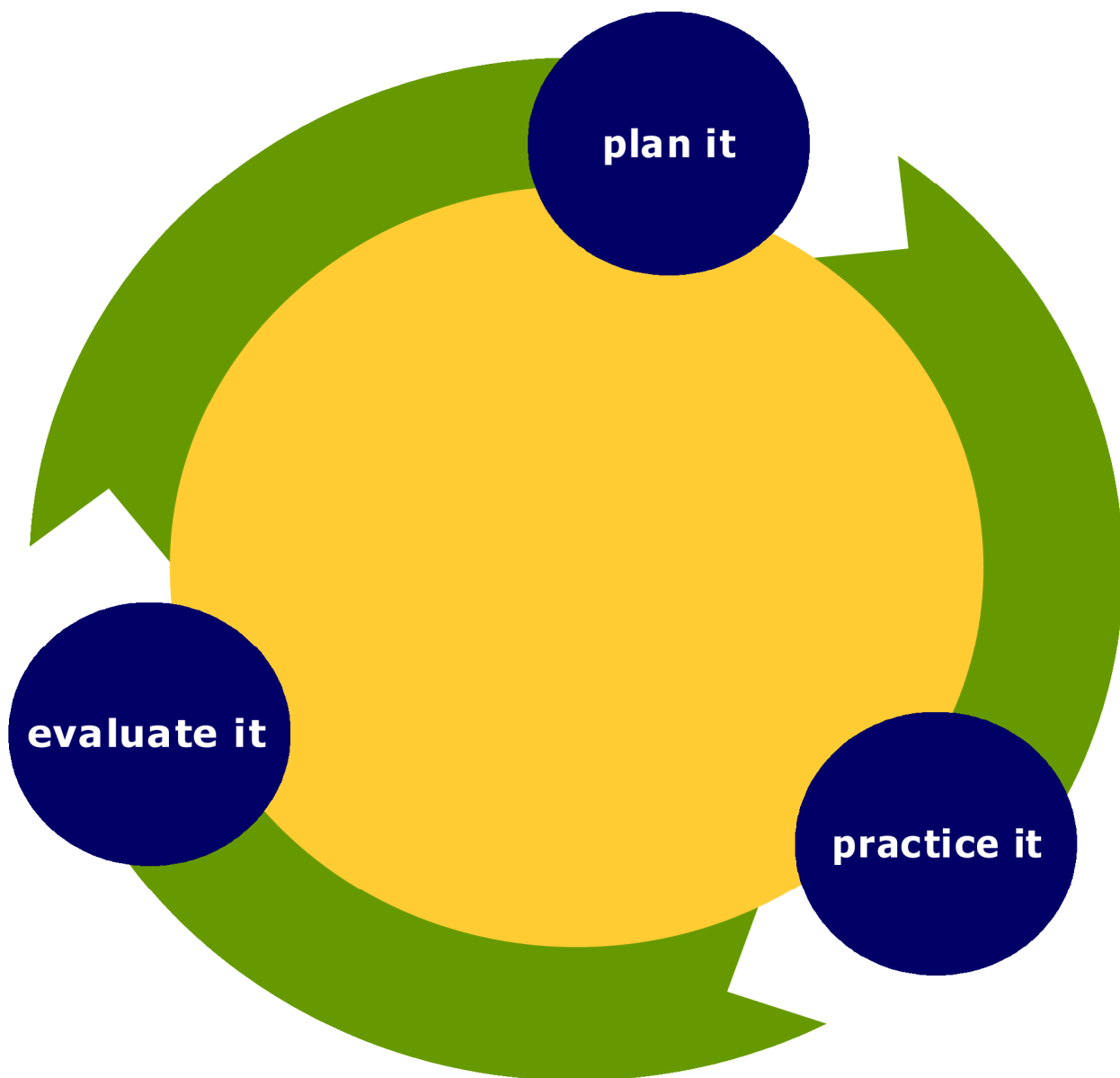
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Grants



- FIPSE grant
- Department of Education's Institute for Educational Sciences
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The Three Phases of SRL Model

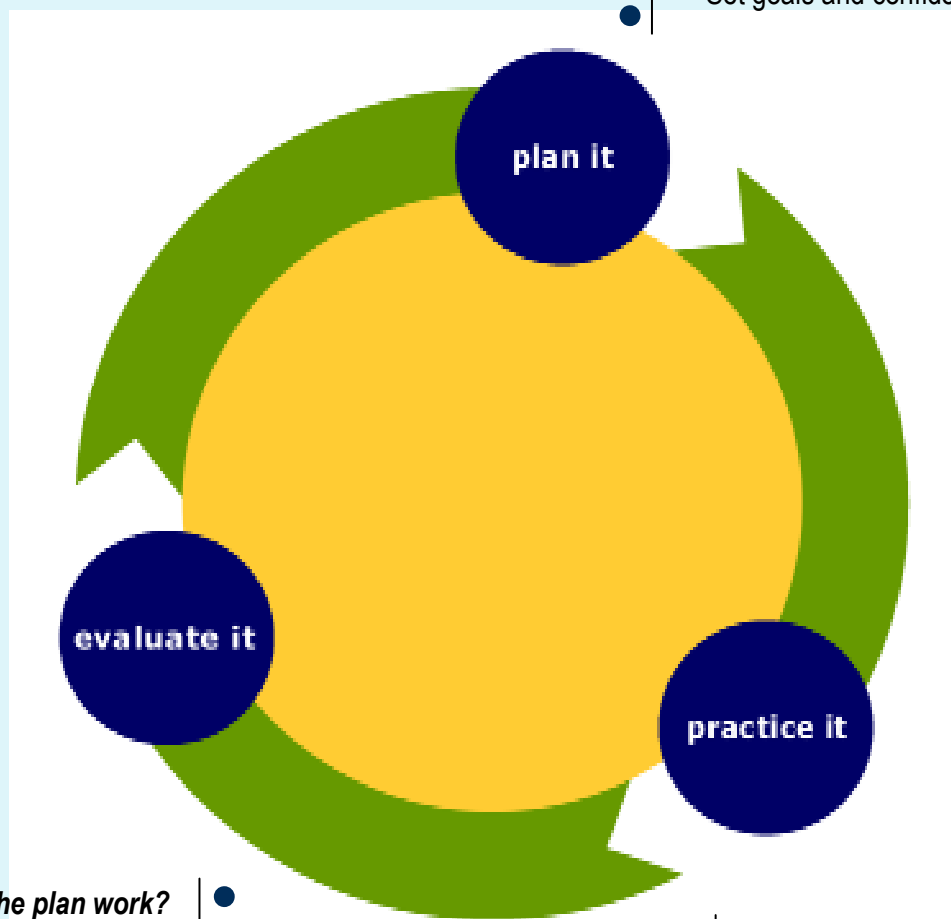




The Steps of the SRL Model

Plan It: What is the problem?

- Review prior performance
- Conduct a task analysis
- Select strategies
- Set goals and confidence estimates



Evaluate It: Did the plan work?

- Self-evaluate strategy use and goal achievement
- Maintain or adapt the strategy

Practice It: Am I doing it correctly?

- Set processing goals to implement a learning strategy
- Self-observe your strategic behavior and outcomes

Plan It: What is my goal?



- Review prior performance
- Conduct a task analysis
- Select strategies
- Set goals and confidence estimates

Practice It: Am I doing it correctly?



- Set processing goals to implement a learning strategy
- Self-monitor your strategic behavior and outcomes

Evaluate It: Did the plan work?



- Self-evaluate strategy use and goal achievement
- Maintain or adapt the strategy

A non-academic SRL example



Follow the three cyclical phases of SRL
in non-academic setting

- Learning to cook
- Following through a weight loss program
- Training for sports

Using SRL in Improving Math Skills



Plan It: What is my goal?



- Goal Setting

- Students are asked to set a long term goal for the course at the beginning of the semester.
- More importantly, students need to establish a series of short term goals throughout the course.

Plan It



Review prior performance

How did I study math before?

Conducting a task analysis

- Break down the steps of a math problem
- Understand what is involved in each step.

Selecting strategies

- Students are asked to select specific and appropriate learning strategies to achieve the goal.
- The strategies should be recorded.

Set a goal

Set a reasonable goal which includes :

- (1) a numerically measurable outcome
- (2) a start date and an end date
- (3) the strategies that will be applied

Practice It: Self-Monitoring



- Am I implementing the plan correctly?

Homework Monitoring - conscious self-monitoring process

- Measures the level of student's understanding of each problem
- Identifies areas of difficulties
- Seeks ways to resolve the difficulties

Evaluate It:



- Self-evaluation of Goal Achievement
 - Did I achieve my goal?
- Maintaining and Adapting Strategies
 - What strategies worked for me?
 - What strategies need to be revised?

SRL Instructional Materials



- Strategy check list
- Quiz revision form
- Math Exam Study Plan
- Weaknesses Chart
- Grade Tracking Worksheet
- Final exam self-reflection checklist

List of Strategies



- Correlation between study time and test result.
- Change study location and/or time
- Take good notes
- Rewrite notes
- Correct all tests and quizzes
- Form study group/buddy
- Seek help: professor, tutors
- Check homework answers from the book
- Identify and correct common mistakes

Quiz Template



quiz_template_with _ revision.pdf

Quiz and self-efficacy judgment



- Students rate confidence level on recently learned material
- Revision process
 - ✦ Reflect on original confidence rating
 - ✦ Demonstrate mastery of the problem
 - ✦ Re-evaluate confidence rating

Self-Efficacy Judgment



- Self-efficacy belief determines how one feels, thinks, behaves, and motivates himself.

(Bandura, 1994)

QUIZ REVISION



Blank_Reflection_Form.pdf

Quiz Revision



- Reflect on the strategies and accuracy of self-efficacy judgment on the quiz
- Identify own mistakes
- Correct the problem
- List steps used to solve the problem
- Solve alternative problem
- Re-evaluate confidence level

Math Exam Study Plan



Self_monitoring_test_prep_form.pdf

Weaknesses Chart



weaknesses_chart_MA.pdf

Identifying areas of weaknesses



- Identify two concrete areas of weaknesses.
- Choose two study strategies to work on for each weakness.
- Track progress.
- Evaluate the effectiveness of the selected strategies and/or select new study strategies if necessary.

Grade Tracking Worksheet



MA_quiz_exam_grade_chart.pdf

Quiz Grade Graph



- Record revised score
- Record original score

Quiz Grade Graph

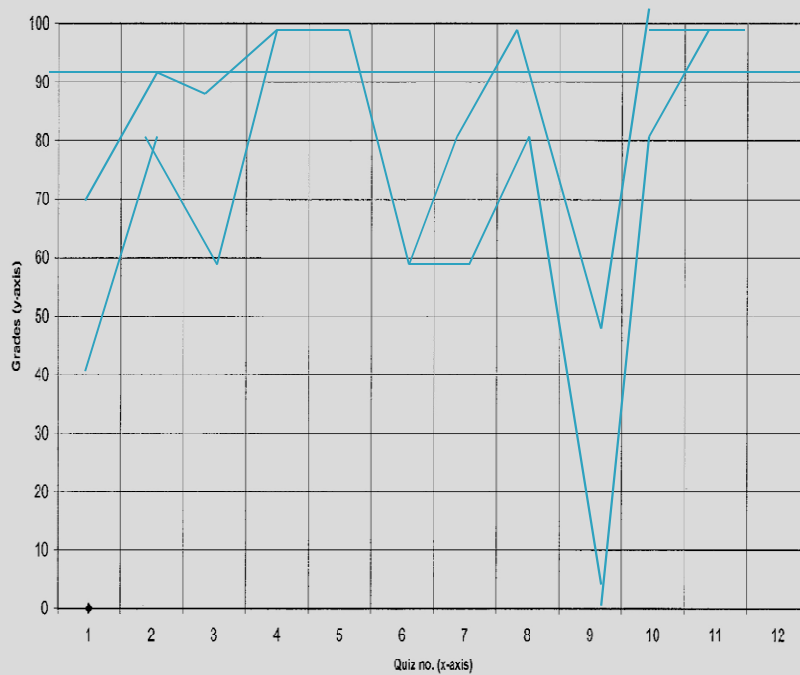


SRL MA065-SUMMER

Name and Section # _____

Instructor's Name _____

What is your standard?-----



Instructor Prediction Sheet



Instructor_prediction_sheet.pdf

Self-Reflection For the Final Exam

We are approaching the end of the semester and the departmental final exam. It is important that you determine which topics you need to review most in preparation for the exam.

Rate your confidence on each of the following topics:

ALGEBRA TOPICS

- | | | | | | |
|--------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|
| 1) Exponents and scientific notation | 1 | 2 | 3 | 4 | 5 |
| 2) Solving systems of linear equations in 2 variables by graph method | 1 | 2 | 3 | 4 | 5 |
| 3) Solving systems of linear equations in 2 variables algebraically
(by addition-elimination method or substitution method) | 1 | 2 | 3 | 4 | 5 |
| 4) Long division | 1 | 2 | 3 | 4 | 5 |
| 5) Factoring | 1 | 2 | 3 | 4 | 5 |
| 6) Solving quadratic equations by factoring | 1 | 2 | 3 | 4 | 5 |
| 7) Multiplying and dividing rational expressions | 1 | 2 | 3 | 4 | 5 |
| 8) Adding and subtracting rational expressions | 1 | 2 | 3 | 4 | 5 |
| 9) Solving rational equations | 1 | 2 | 3 | 4 | 5 |
| 10) Simplifying radical expressions | 1 | 2 | 3 | 4 | 5 |
| 11) Rationalizing the denominators of radical expressions | 1 | 2 | 3 | 4 | 5 |
| 12) Solving radical equations | 1 | 2 | 3 | 4 | 5 |
| 13) Solving quadratic equations by the quadratic formula | 1 | 2 | 3 | 4 | 5 |

GEOMETRY TOPICS

- | | | | | | |
|-----------------------------------------------------|---|---|---|---|---|
| 14) Congruent Triangles | 1 | 2 | 3 | 4 | 5 |
| 15) Parallelograms | 1 | 2 | 3 | 4 | 5 |
| 16) Similar Triangles and Proportions | 1 | 2 | 3 | 4 | 5 |
| 17) Pythagorean Theorem | 1 | 2 | 3 | 4 | 5 |
| 18) Special Right Triangles (30-60-90 and 45-45-90) | 1 | 2 | 3 | 4 | 5 |
| 19) Trigonometric functions | 1 | 2 | 3 | 4 | 5 |
| 20) Solution of Right Triangles | 1 | 2 | 3 | 4 | 5 |

How do you plan to prepare for the final exam? Be specific about the strategies you use.

1. _____
2. _____
3. _____
4. _____
5. _____

Levels of Students Engagement in SRL



Level of SRL	Plan It	Practice It	Evaluate It
Guiding Questions	<ul style="list-style-type: none"> - What are you going to accomplish? - What steps will you take to achieve the goal? - What strategy will you use to achieve the goal? 	How can you monitor your progress and use of the chosen strategies?	<ul style="list-style-type: none"> - Did you achieve your goal? - Did your strategy help you achieve your goal? - What adjustments in strategy are necessary?
High Show Consistent Engagement	Student performs task analysis and sets specific and achievable goals.	Student consistently monitors his use of strategy during practice	Student consistently evaluates his goal achievement and makes adjustment to his plan
Medium Somewhat Engaged	Student develops a partial task analysis and is somewhat engaged in goal setting	Student sometimes monitors his use of strategy during practice	Student sometimes evaluates his goal achievement and makes adjustment to his plan
Low Little or No Engagement	Student is unclear about task analysis and engages in little or no goal setting	Student rarely monitors his use of strategy during practice	Student rarely evaluates his goal achievement and makes adjustment to his plan

The Role of the SRL Instructor



- Gives frequent quizzes to provide frequent and specific feedback
- Provides opportunity for quiz/test revision
- States strategies clearly on the board and model problem-solving using the strategies. Constantly refers to the strategies.
- Uses common mistakes as learning tool
- Asks questions that help students to connect or link topics together, such as “how” and “why”

The Role of the SRL Instructor



- Identifies and challenges negative beliefs about student ability to succeed in math.
- Asks questions which raise self-awareness in learning.
- Teaches students to make accurate self-efficacy judgments.
- Coaches students to take responsibility for their own learning.
- Help students achieve positive experiences with math

Level of Self-Efficacy vs. Level of Proficiency



Low Self-Efficacy, Low Proficiency:

- I studied, but still didn't do well
- I was never good at math.

High Self-Efficacy, Low Proficiency:

- I know the material, I just made careless mistakes.”
- “I failed the exam by only two points”

Level of Self-Efficacy vs. Level of Proficiency



- Teacher's positive feedback can help boost the confidence
- The correlation between confidence level and the test score can help students adjust their self –efficacy judgment
- Help students focus on the learning process and make connection that the result is the outcome of learning process, not a matter of luck.

Find the mistake #1

Evaluate the expression:

$$10 - 4(-3)^2 = 6 \cdot 9 = 54$$

“Mistakes, obviously, show us what needs improving. Without mistakes, how would we know what we had to work on?”

•Peter McWilliams



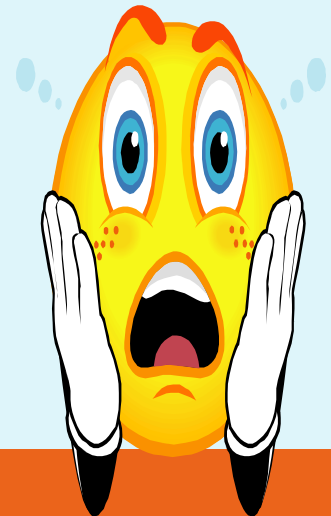
Find the mistake #2

Combine and simplify:

$$\begin{aligned} & 9x - 7y - (5x + 6y) \\ = & 9x - 7y - 5x + 6y \\ = & 4x - 13y \end{aligned}$$

"You must never feel badly about making mistakes," explained Reason quietly, "as long as you take the trouble to learn from them. For you often learn more by being wrong for the right reasons than you do by being right for the wrong reasons."

-Norton Juster, The Phantom Tollbooth



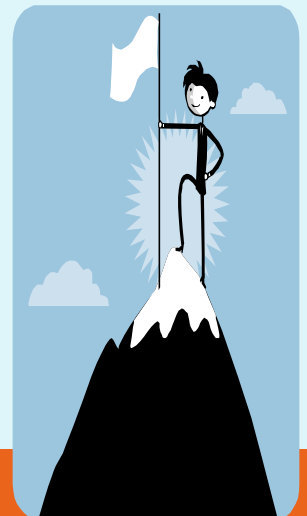
Find the mistake #3

If 5 less than twice x is 15, find the value of x.

$$\begin{array}{r} 5 - 2x = 15 \\ -5 \quad \quad -5 \\ \hline -2x = 10 \\ x = -5 \end{array}$$

“Nobody trips over mountains. It is the small pebble that causes you to stumble. Pass all the pebbles in your path and you will find you have crossed the mountain. “

-Anonymous



Presenters' Emails



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Project Website



- <http://www.selfregulatedlearning.blogspot.com/>