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Commitment to Learning

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Background to the Research

RESEARCH QUESTION

The research question guiding this project was:

Will metacognitive training enhance student commitment to learning?

Our goal in initiating the research was to explore ways of assisting students to evolve so that they demonstrated an individualized, self-monitored approach to learning.

To reach this goal, we began by compiling a comprehensive list of metacognitive skills and practices for students studying English Language Arts in grades 7 to 12 in three rural high schools in Saskatchewan. Later our target group was narrowed to those students in ELA 10.

Our plan was to guide these students in integrating these metacognitive skills and practices into their learning. It was our expectation that through this process, we would be able to observe an increase in the students' commitment to learning. Our intention was to develop teaching and assessment strategies that would facilitate student learning of metacognitive skills and practices. We planned to use such tools as rubrics, metacognitive training, and reflection opportunities.

WHY RESEARCH THIS?

As teachers, we had observed that for many students, setting goals, maintaining discipline, persisting to do their best work, and reflecting on what they might do to improve their learning are not natural, automatic practices. Student learning is often extrinsically motivated by teachers, parents, and societal expectations. Students are provided with opportunities to learn and are often challenged to learn when they don't have learning opportunities provided for them.

Also, although students' opportunities to learn are shaped by many factors, a particularly important component that may not get direct attention in a classroom setting is teaching students how to think and consequently behave like learners. Teachers often assume students have the prerequisite "readiness to learn" related skills; however, this assumption is often mistaken.

The Saskatchewan Ministry of Learning has identified a significant correlation between metacognitive skills and practices and test performance in areas such as critical and creative thinking, math, and English Language Arts. This correlation raised for us an important question: If we, as teachers, placed more emphasis on metacognitive training and assessment of students, would our students experience an increase in academic success and would there be an increase in their commitment to learning?

Literature Overview

Much of the first year of our research project focused on a literature review that would assist us in defining our task and identifying metacognitive strategies that we could teach our students to enhance their commitment to learning. Since the literature relevant to our research was vast, we narrowed it by focusing on the following key words and goals:

- Commitment to learn
- Metacognition (thinking and analysis of thinking – the skills are involved in this process)
- Reflective practice (guided reflection)
- Constructivist learning theory
- Action research
- Reflection for future action
- Connection between the rationale for this research and foundational objectives in the curriculum (the time spent is worthwhile because...)
- Provision of information and tools for other teachers with similar pedagogical beliefs
- Connection between processing and student learning.

Understanding the Concepts Underlying Metacognitive Strategies

From the literature we developed an understanding of key concepts that formed the foundation for our research. Before we could select and teach metacognitive strategies, we needed to develop a fuller understanding of learning, cognition, thinking and metacognition.

LEARNING

As teacher-researchers we understand that learning is a process, not a product. Moreover, it is a highly personalized process whereby individuals use their informed, engaged and reflective effort to develop their abilities to know, do and feel.

The learning process involves interaction between the three divisions of the brain in charge of Cognition, Conation and Affectation (Johnston, 1996).

Cognition	Conation	Affectation
<ul style="list-style-type: none"> • Processing self • Intellectual ability • Mental acuity • Memory • Range of experiences • Level of abstraction or concreteness 	<ul style="list-style-type: none"> • Mental process of action • Involving the will such as impulse, desire or resolve • Persistence • Natural pace, autonomy • Engaged energy • Bridging between the cognitive and affective aspects of the learning process • The performing self 	<ul style="list-style-type: none"> • Personality • Soul/heart • Feelings • Values • Sense of self • Myers/Briggs personality types • Self esteem • Self efficacy • Developing • Perception of capacity to learn affects the conative and cognitive learning processes

There is much more to learning than cognitive processing. Learning occurs by changing the synapses in the brain so that the influence of one neuron on another changes. These changes are stimulated by acquiring new information and experiences.

COGNITION

The cognitive system is the brain's information processor and its mechanism for memory. Cognition (Microsoft, 2002) is the mental faculty or process of acquiring knowledge by the use of reasoning, intuition or perception. It may also be defined as the act or faculty of knowing. It involves the language and communication centers of our brain and includes our experiences. The product of cognition (knowing) is perception or insight.

Marzano (1998) organized the cognitive system into four categories:

Storage & Retrieval Processes	Information Processing Functions	Input/Output Functions	Knowledge Use Functions
<ul style="list-style-type: none"> • access to knowledge in permanent memory • ways of storing new knowledge so that it might be drawn on later 	<ul style="list-style-type: none"> • manipulating stored knowledge so that it might be utilized for specific tasks 	<ul style="list-style-type: none"> • use knowledge to understand communication thru hearing – writing – reading with the outside world 	<ul style="list-style-type: none"> • uses knowledge to carry out specific tasks • procedural goals are carried out thru this part of the cognitive system

For the most part, cognition is what we teach to students in our schools, and it is what students draw on when their learning is being assessed.

THINKING

Thinking is a process of using the mind to consider ideas and make judgments. The word “think” may be a transitive verb needing a direct object (as in “they were thinking about the sex act”) or it may be an intransitive verb with no direct object (as in “she was thinking ... while having sex”).

Various models of thinking have been developed. It is on the basis of these models that people may talk about systems thinking, lateral thinking, dialectical thinking, integrative thinking or the cognitive, affective or psychomotor domains in Bloom’s taxonomy.

METACOGNITION

Metacognition is a higher order of thinking that involves active control over the cognitive processes engaged in learning, for example, planning, monitoring or evaluating. Learners are aware of and regulate their own mental and affective states of mind (i.e., their cognitive, social, emotional, physical characteristics). Metacognition involves deliberate interventions to affect and evaluate one’s own thinking. This mediated form of learning includes planning, monitoring and evaluating cognitive, conative and affective functions. It requires that the learner be able to stand outside the cognitive situation or moment in order to plan, monitor and evaluate. Metacognition is what Donald Schon is referring to when he talks about Reflection for action – Reflection in action and Reflection on action (Schon, 1983). Knowledge and control of oneself and one’s cognitive processes is driven by individual commitment, attitude and attention.

Flavell (1979) recognized four elements in metacognitive ability: Knowledge (may be declarative, procedural or conditional), Experience, Goals and Strategies. These elements have a strong relationship to the processes that may be seen in Executive Control: Planning, Regulating and Evaluating (Flavell, 1979). Metacognition is thus linked to abilities often necessary to provide leadership.

METACOGNITIVE SKILLS

Learners with metacognitive skills recognize when they have a problem learning. They are able to spot inconsistencies and incompatible assumptions in their own thinking. They know when to consciously apply a variety of problem-solving strategies to explain why they made a particular decision, and they use self-monitoring techniques, e.g., frequent checking, goal setting, reassessing and evaluation.

METACOGNITIVE STRATEGIES

Metacognitive strategies are sequential processes used to control activities to ensure that a cognitive goal has been met. They help to regulate and oversee learning. Such strategies involve planning and monitoring cognitive activities and checking outcomes.

METACOGNITIVE DEVELOPMENT

Stipek (1992, p. 44) talks about the development of self-regulating behaviors that allow students to learn. Students who say to themselves, “I want to be committed to learn – I want good marks” also ask themselves, “What self-regulating processes can I develop?” Students need to learn metacognitive steps that help them to control their brains, their bodies and their impulses in order to ensure that they learn.

MEMORY

The capacity of the brain to store information is unlimited. The way the brain processes information affects the degree of retention. How the learner goes about processing new information has a great impact on the quality of what is learned and determines whether and how it will be retained.

Perceptual filtering by the learner based on past learning experiences determines the degree of importance the learner gives to the incoming data required for new learning.

A learner’s perceptual filters monitor the strength and nature of sensory impulses (data) which in turn register with the sub-conscious short term memory (which acts as an extension of the perceptual filter). The transfer from short term to working memory which is where conscious data processing occurs is influenced by a learner’s past experiences and emotions (Sousa, 1995). Perceived threats and emotions influenced a learner’s cognitive processing, impacting short term and working memory and ultimately long term memory storage and retrieval.

Because perceived threats and emotions affect memory processing it is our belief that metacognitive strategies can be used to “override” the tendency for a learner to “down-shift” their motivation to do the processing necessary for learning (Sousa, 1995). Resnick et al (1989) states that cognitive processes are integral to motivation to learn and that the habits of mind to discipline and train the mental work of the brain should be taught to the learner.

General self regulating cognitive processing strategies can be taught across subject matter boundaries (Schoenfeld, 1989). A learner self regulates by monitoring their current state in the learning process and by doing. The most important point is that through practice of self regulation, students can develop voluntary control over their own learning (Hartman, 2001).

The concept of students taking over cognitive processes led us to consider metacognitive strategies that may impact short, working and long term memory. Not all students develop and use metacognition spontaneously and teachers can provide students with explicit instruction in both metacognitive knowledge and metacognitive strategies (Hartman, 2001). Planning, monitoring and evaluating strategies taken from (Fogarty, 1994) were therefore selected to impact memory processing which we believed would ultimately increase our students' efficacy as learners.

Action Research to June 2007

DATA GATHERING

At the beginning of our research, we developed a questionnaire and gave it to students as a way for us and them to understand how they learn best. Students were asked the questions given below:

1. Describe how you learn.
2. Describe your thinking when you are learning.
3. Describe whether or not you find learning easy.
4. When do you like learning?
5. What helps you learn?
6. What things do you do on purpose to make sure you learn?
7. What stops you or gets in the way of your learning?
8. What do you do when you have trouble learning?
9. How do you learn by yourself?
10. What are some ways you can make yourself learn (even though you might not feel like it)?
11. What prevents you from learning?
12. Is there anything else you can share about your learning?

We found that the students' responses to these questions provided an interesting reflective piece, but the range of information they provided was very broad. It was clear that the scope of our research was too large so we met and narrowed our topic. Our original topic, "Metacognitive Strategies to Enhance Commitment to Learning," was refined to focus on "Metacognitive Strategies to Create and Enhance Learning to ELA 10." This focus enabled us to develop a plan for a field study to be conducted in ELA 10 in semester two.

We chose six metacognitive strategies from R. Fogarty's *The Mindful School: Teach for Metacognitive Reflection* (1994), for our field study that fell into three categories: Planning, Evaluating and Monitoring:

1. Planning
 - Goal Setting
 - Thoughtful Lead-ins
2. Evaluating
 - Mrs. Potter's Questions
 - Checklists
3. Monitoring
 - Recovery
 - Tracking

After each metacognitive strategy was taught, the students were asked for feedback about its impact on their metacognitive skills and commitment to learning. We also asked students to reflect on their experiences in journals. Their comments have been captured in Appendix 1, which provides student perspectives on what it means to be a metacognitive thinker, as well as the ways that they view use of mnemonic devices, mental menus and checklists and the evaluation of their own work.

In addition, the researchers kept their own journals to reflect on what they observed in the classroom and their own experiences with the research. The researcher reflections provided later in this report are drawn partly from the thoughts recorded in the researchers' journals.

THE TEACHING PLAN

Together the researchers developed and implemented a teaching plan. Each metacognitive strategy would be taught, reinforced and used regularly for three months. At the end of that time, students would be asked for feedback on the impact each strategy had on their cognitive processing as follows. The progress of each student would be gauged systematically using a rubric that the researchers developed for this purpose (see Table 1).

TABLE 1: METACOGNITIVE STRATEGIES TO ENHANCE COMMITMENT TO LEARNING

Developed by: Kathy Enns, Myrna Briggs Enns, Tish Karpa

Planning	Level 1	Level 2	Level 3	Level 4
Goal Setting	I reluctantly plan learning by setting goals when directed to, but I don't intend to use the goals to direct my actions.	Occasionally I plan my learning by setting weekly or long-term goals. I find these useful in providing direction and focus even if I don't meet them.	I plan my learning by setting and meeting realistic weekly and long-term goals. Sometimes I upgrade my goals.	I direct my learning by internalized realistic goals, set specifically for each day's classes. Because I am eager to accomplish a lot I regularly adjust my goals.
Thoughtful lead-ins	I do not use stem statements to guide my thinking unless the teacher reminds me.	I occasionally use stem statements to guide my thinking without being reminded.	I guide my thinking by using stem statements on my own without being reminded.	I guide my thinking using stem statements on my own. In fact, I make up my own stem statements.

Evaluating	Level 1	Level 2	Level 3	Level 4
Mrs. Potter's Questions	I do not evaluate my learning by using Mrs. Potter's Questions unless instructed to do so. I do not intend to apply the information.	I sometimes evaluate my learning by using Mrs. Potter's Questions. I do not apply the information to my next activity.	I evaluated my learning by using Mrs. Potter's Questions. I do not always use this information next time I complete an activity.	I evaluated my learning by using Mrs. Potter's Questions. I then use this information next time I complete an activity.
Checklists	I reluctantly evaluate my learning by using checklists. I do not intend to incorporate what I discover from the checklists to make learning easier next time.	I occasionally evaluate my learning by using checklists. I may incorporate what I discover from the checklists to make learning easier next time, if reminded to do so.	I evaluate my learning by using checklists. Sometimes I incorporate what I discover from the checklists to make learning easier next time.	I evaluate my learning by using checklists (teacher or self-made), then incorporate what I discover from the checklist to make learning easier next time.
Monitoring	Level 1	Level 2	Level 3	Level 4
Recovery	I have the ability to know when there is a gap in my learning and I need to recover information, but I do not use strategies to recover, recapture, or rethink in order to regain the knowledge.	I occasionally, when asked, use strategies to recover, recapture, or rethink in order to fill the gap in my knowledge base.	I sometimes use strategies, even when not reminded, to recover, recapture, or rethink to fill the gap in my learning.	I use strategies to recover, recapture, or rethink information because I want to regain my knowledge.
Tracking	I do not rely on mental menus to assist with my learning.	When asked, I will use mental menus to assist with my learning.	I occasionally, without being asked, will use mental menus (teacher or self-made) to assist with my learning.	I always use mental menus (teacher or self-made) to assist with my learning.

To reinforce the strategies being taught, the researchers developed sets of classroom posters that used the information provided in Appendix 2.

A field test of the teaching plan and data-gathering methods was conducted from January to June, 2007, but the research ended before our plans and methods were refined and implemented fully.

When and Why the Research Ended

Following the field test of the methodology from January to June, 2007, the researchers (Tish, Myrna, Kathy) intended to continue the action research for another school year in order to gather more data related to the impact of the metacognitive strategies on student learning. However, due to personal and family circumstances as well as changes in teaching assignments and variations in support from our school divisions, we were unable to complete the action research we had originally intended to carry out.

First, one member of our team, Tish, became an Executive Assistant with the Saskatchewan Teachers' Federation, although we were fortunate in that Ann-Marie Sauer was able to take her place. Then our second member, Kathy, became the first president of the newly amalgamated Sun West Teachers' Association, and without release time, she was limited in the commitment she could give to this project. Also, she was gone for seven weeks in Mongolia, participating in Project Overseas and touring China. Myrna, our third member, took on a new teaching load that involved teaching ELA to grades 7 through 12 in her school, so her planning time and learning curve increased sharply. Lastly, Kathy and Myrna's father was diagnosed with terminal cancer; their role as caregivers became more committed as his illness progressed and life ended.

Due to this combination of unforeseen circumstances we had to conclude that we were unable to complete the study in full. In fulfillment of the reporting requirement in our contract with the McDowell Foundation, we have submitted a report that details what unfolded during the first part of our project. Although the report is not complete, however, we wish to emphasize that our experience was fruitful in terms of our own professional learning as well as our students' learning.

Preliminary Results, Tentative Conclusions, and Reflections

We believe that our research, incomplete as it was, yielded some preliminary results that are worth sharing. Our findings included the following:

- Intrinsic motivation is critically important to learning; therefore, strategies to develop self-disciplined thinking and self control over cognitive processing can empower students to take control of their cognitive functions.
- The metacognitive strategies incorporated daily into our lessons created a “thinking, learning” partnership between us and our students; learning how to organize thinking and learning was just as important as the course content.
- The research renewed our respect for student involvement in self-disciplined learning.

We continue to teach metacognitive strategies, building on the repertoire of strategies which partners well with the outcomes-based curricula in Saskatchewan. Student learning in our province has become more “student driven” so the strategies seem to assist students with their own intrinsic motivation to learn. In our teaching we capitalize on and reinforce the idea that students need to learn and practice the metacognitive strategies in order to be in control of their learning. Our successful experiences in this arena have contributed to our enthusiasm and confidence as we continually expand differentiated instructional strategies.

In reflection on the impact that this study had on us as teachers, we have noted the development of a much deeper understanding of the constructivist learning theory and the twelve intelligent behaviors for learning as developed by Costa (2000). Also, the relationship and scaffolding to developing student moral and emotional intelligence is a natural off-shoot of our learning. Finally, the research process reinforced our confidence in seeking our own professional development and underscored the importance of ongoing professional reflection in terms of our own learning as well as our students’ learning.

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Appendix 1: Student Journal Reflections

In their journals, students offered the following comments on what it means to be metacognitive thinkers, as well as the use of mnemonic devices, mental menus, checklists, and the evaluation of their own works.

METACOGNITIVE THINKER

- It lets me know my boundaries and what not to waste my time on and what I need to find out.
- Helps me to understand what I know and don't know.
- It determines what I should study for (exam) or research.
- Makes me a mature thinker.
- Makes me feel good that I can sort out what I do know and don't know.
- Realize what I do and don't know.
- I understand what I may need help on.
- Shows me what places I don't know what to do.
- I recognize what I don't know and I can do something about it.
- To know what you have to work on and what you don't – so you don't waste time.
- You focus on stuff you don't know.
- Have knowledge of what I need to learn.
- Accept that I don't know everything.
- Don't need the teachers to do everything for me.
- Realize what I need to learn.
- Helps studying procedures.
- So I can study stuff I don't know.
- Helps with learning, ask questions on what I need to know.
- Better study habits, feel like I don't need to study everything (which can be scary).
- Helps me to learn what I need to, enables me to focus on a certain topic.
- Saves me time by not wasting time on what I know.
- You get to know yourself better.
- I understand what I need to study.
- Helps me feel smart and know that I can do it myself.

TRACKING USING MNEMONIC DEVICES AND MENTAL MENUS

- Helps you remember things.
- Makes me think.
- Makes things easy to remember that would otherwise be more difficult.
- Helps you sort things out.
- Better study habits.

- Feel more organized in studying.
- Helps me remember things.
- Helps maintain and organize my thoughts. You can remember how to do things a lot easier.
- Helps me remember steps that are important.
- Keeps a mental list of steps.
- Easy to memorize things.
- Those things stick in your head forever.
- You can follow the progress of your work.
- I can remember things a lot easier.
- It's an easier way to learn steps, especially in math.
- Helps me get better marks and then I feel better about that class.
- Helps me memorize notes.
- Helps me remember work.
- Helps me to understand things in order or steps such as ROYGBIV or BEDMASS.
- KWL helps me use past knowledge to what I want to know and figure out new things.

CHECKLISTS

- They make sure that I get all the required information and everything done I'm supposed to.
- Using checklists helps me keep organized and put together. I feel like I benefit when I hand in something I know is complete.
- Keeps me organized and on time.
- Keeps me on track and focused.
- Helps me remember the information that I need for something.
- I know when something is finished for sure.
- I make sure I have everything on my work completed.
- That way I never forget things.
- I can cut out the unimportant things.
- Keeps things organized and in order.
- Ensures that nothing is forgotten.
- I can check to make sure I'm 100% complete an assignment, then I don't have the teacher telling me I forgot something. I know what the teacher wants.
- Helps me keep in peak educational performance.
- I go over stuff to maintain a good "test."
- Helps me in the future when I don't have someone else to look it over for me.
- Keeps me organized and orderly.
- I know that I didn't forget anything necessary.
- Sure keeps me organized. I like them.

EVALUATING MY WORK WITH MRS. POTTER'S QUESTIONS

- You know what you need to work on next time.
- You know where your strong points are and what needs improving.
- Helps me get information for future work.
- I get to see areas I need to work on.
- I know what I did well and how I will change things next time.
- I know how I'll change things up next time without a teacher telling me.
- I realize my own mistakes.
- I learn how to do things well.
- I can catch my own mistakes without being told.
- I know how to do better next time.
- Makes me think about how I could do better.
- I give myself advice.
- Sometimes I find my own problems or find something that doesn't make sense.
- I see for myself what I need to do to do better.
- I see what information needs to be improved.
- Helps me understand my own work.
- Helps me learn how to do better.
- Helps me to understand what I did good and bad on without being told and what I need to work on.
- I can plan for next time – to do a better job or not to forget something.

Appendix 2: Poster Information to Reinforce Metacognition Strategies

Given below information that was used to develop sets of classroom posters that reinforced the teaching of metacognition strategies in the ELA 10 classroom.

METACOGNITIVE THINKER

The ability to know **when I know** and know **when I do not know** something has earned me the Metacognitive Thinker badge!

(1) PLANNING

THOUGHTFUL LEAD-INS

- Stem statements guide thinking in a number of directions.
- Stem statements stir the pot with prior knowledge and past experiences.

STEM SAMPLES:

- A question I have is...
- I wonder...
- A connection I made yesterday was...
- One thing I know about this topic is...
- I predict that...

Eventually, as you become more sophisticated in your use of metacognitive strategies, you will generate your own stems.

GOAL SETTING

Goal setting: one step at a time!

Short term such as: finishing a good book, completing your homework.

Long term: such as: learning to play the guitar, completing grade 12, preparing for and running the 1000 m race.

(2) EVALUATING

Mrs. Potter says:

Evaluate your work by asking...

1. What were you trying to do?
2. What went well?
3. What would you do differently next time?
4. Do you need help?

Mrs. Potter's Questions help you evaluate and think reflectively for long-term thinking.

CHECKLISTS

- Checklists create a tool for scanning the finished lesson or project as you look for flaws or assets
- Checklists provide a way to look at the big picture.
- Awareness leads to changes in behavior in the long run, especially if you see a pattern.

(3) MONITORING

RECOVERY STRATEGIES

RECOVER! RECAPTURE! RETHINK!

- In my logic chain there is a missing link!
- I am aware there is a problem or mistake so I need to take an alternative approach
- To recover my thought I could
 - Reread from the beginning
 - Reflect a moment to capture the ideal mentally
 - Look at the chart or diagram

TRACKING

MNEMONIC DEVICES

MENTAL MENUS

- Identify the problem
- Develop alternatives
- Execute a solution
- Assess the results

B=Base your bet on the best information you have.

A=Express possibilities and probabilities in search for ideas.

T=Tender your bet by making an educated guess or a prediction.

AGO (Aims, Goals, Objectives)

OPV (Other point of view)

KWL

What we know

Want to know

What have we learned?

Write the first draft

Revise the draft

Insist on an outside critique

Test by reading aloud.

Enter the final version for publishing

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