Exploring the Effects of a Cyclical Model of Self-Regulated Learning in Learning Educational Psychology

by

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ABSTRACT

This paper is a report of an action research conducted to improve students' approach to learning Educational Psychology and also to enhance their self-efficacy in the subject. Twenty-five students (8 males and 17 females) in the first year of a Bachelor of Education (B. Ed.) Program participated in this study. A cyclical model of self-regulated learning (SRL) put forward by Zimmerman, Bonner and Kovach (1996) was implemented over a period of eight weeks. Students were given instruction and guidance in carrying out the four steps in the cyclical model. I monitored the implementation of the steps in the model through students' written records of what they did. Data sources included achievement tests, self-efficacy scale, and students' written reflections. The results show that the cyclical model of SRL enhanced students' attainment in Educational Psychology and raised their self-efficacy in the subject. The study also gave me insights into the struggles that students faced as they tried to master the subject.

Introduction

Educational Psychology is a field of study that involves learning many new terms and theories related to classroom teaching and learning. Knowledge and understanding of these facts is needed to enable students to answer questions that require them to apply what they have learned in different learning situations. Instructing and guiding students in learning the subject is an equally challenging task. I encountered such a challenge when I taught Educational Psychology to a class of first year university students. Early in the semester, I requested them to write reflections on how they were getting on with studying the subject. Their reflections revealed that they were at a loss as to how to cope with learning Educational Psychology. Some expressed despair at ever being able to pass the subject because they were overcome with anxiety whenever they thought of studying Educational Psychology. They were 'overwhelmed' by all the new terms that they

needed to learn. Some said they had difficulty in understanding and remembering the theories let alone applying them in various learning situations. Through further discussions with them, I found that the only learning strategy that most of them used was memorization. Some admitted that they needed to be more organized and disciplined learners. Others said they didn't know where to start …. Results of a pre mid-semester test confirmed this problem: only five out of the 25 students in the class attained a score of more than 50% in the test. I decided then that there was a need to instruct and guide them in the use of self-regulated learning (SRL) strategies to help them improve their approach to learning Educational Psychology and also to enhance their self-efficacy in the subject.

Review of Literature

My scrutiny of the literature revealed that over the past two decades, quite extensive research has been carried out on SRL. The belief that students are able to initiate and control their own learning resulted in this area of research. Self-regulated learning refers to the extent to which an individual is an active agent in his or her own learning process, metacognitively, motivationally, and behaviorally (Zimmerman, 1986). Self-regulated learners are metacognitively active in that they plan, organize, self-instruct, and self-evaluate at various stages during the acquisition process. They are motivationally active in that they perceive themselves as self-efficacious, autonomous, and intrinsically motivated. They are behaviorally active in that they select, structure, and create social and physical environments that optimize acquisition. Self-regulated learners are therefore learners who are actively involved in using academic self-regulatory processes during learning. Academic self-regulatory processes include planning and managing time, attending to and concentrating on instruction, organizing, rehearsing, and coding information strategically, establishing a productive work environment, and using social resources effectively (Zimmerman, 1994).

Meanwhile, research on self-efficacy came into focus in 1986 when Albert Bandura put forward the Social Cognitive Theory of learning. According to Bandura (1986, p. 25), "what people think, believe, and feel affects how they behave." Self-efficacy refers to "people's judgments of their capabilities to organize and execute courses of action required to attain designated types of performances" (Bandura, 1986, p. 391). It is not concerned with the skills one has, but rather with judgments of what one can do with whatever skills one possesses. Self-efficacy beliefs influence how people feel, think, motivate themselves, and behave. People with low self-efficacy tend to believe things are tougher than they really are, leading to stress, depression, and lack of confidence in solving a problem. High self-efficacy, on the other hand, helps create feelings of serenity in approaching difficult

tasks. Efficacy beliefs also help determine how much effort people will expend on an activity and how long they will persevere in the face of challenges and obstacles (Pajares, 1997). The higher the sense of self-efficacy, the greater the effort, persistence, and resilience.

Previous research on the relationship between self-efficacy and self-regulated learning (Wong & Siow, 2003; Zimmerman & Bandura, 1994; Zimmerman & Martinez-Pons, 1990; Zimmerman, Bandura & Martinez-Pons, 1992) show that high self-efficacy is usually related to a greater use of SRL strategies. Greater use of SRL strategies and higher self-efficacy has also been related to higher academic achievement (Chye, Walker & Smith, 1997; Purdie & Hattie, 1996; Zimmerman & Bandura, 1994; Zimmerman & Martinez-Pons, 1990).

In 1996, Zimmerman, Bonner, and Kovach put forward a cyclical model of SRL to inculcate the use of SRL strategies among students and at the same time to raise their self-efficacy for learning. I noted that hitherto there have been no documented records of studies on the benefits of this approach to promoting the use of SRL strategies among learners in the local setting. I therefore decided to investigate the effects of this approach to instructing and guiding my students to be self-regulated learners. I also hoped that this would in turn enhance their self-efficacy and improve their attainment in Educational Psychology.

Design and Methodology

Research Design

I decided to use the four-step action research cycle put forward by Kemmis and McTaggart (1988) to carry out my study. The four steps included (1) Initial reflection on the situation, (2) Planning for improvement, (3) Enacting the plan and observing how it works, and (4) Reflections.

Participants

There were 25 students (8 males, 17 females) in the B. Ed. class involved in this study. They were in the first year of their degree program. Educational Psychology was one of the core papers in the program. The mean age of the students was 20.28 years ($SD = .46$). They consisted of 28% Malays ($n = 7$), 28% Chinese ($n = 7$), and 44% Ibans ($n = 11$).

Data Collection

Achievement test

An achievement test consisting of 30 objective items on five topics in the Educational Psychology syllabus (Teachers, Teaching and Educational Psychology; Cognitive Development and Language; Personal, Social, and Emotional Development; Behavioral Views of Learning; and Cognitive Views of Learning) was constructed to assess students' knowledge of educational

psychology. This was administered at the beginning and at the end of the study. The equal-length Spearman-Brown reliability coefficient for the instrument was .73.

Self-Efficacy Scale

I constructed a self-efficacy scale consisting of 10 items (on the above-mentioned topics) to assess students' self-efficacy. Self-efficacy reflects the individual's level of confidence in accomplishing a certain task. Self-efficacy beliefs are assessed by asking individuals to report the level, generality, and strength of their confidence to accomplish a specific task or succeed in a certain situation (Pajares, 1997). In keeping with how academic self-efficacy is assessed (Pajares, 1997; Zimmerman & Bandura, 1994; Zimmerman & Martinez-Pons, 1990), students were not required to write down the answers to the items in the scale. They were only required to give realistic estimates of their confidence in answering each item correctly on a 10-point scale (refer to Appendix A). The scale had moderately high measures of internal consistency: Cronbach Alpha was .88 while item-total correlations ranged from .48 to .80.

Reflections

Students' written reflections at the beginning and at the end of the study was another source of data in this study. Students were given some questions to guide them in writing their reflections. At the beginning of the study, after sitting for the pre test and completing the self-efficacy scale, they were requested to answer the following questions: What have I learned from this experience? What do I need to do to improve in my performance in Educational Psychology? At the end of the study, they were requested to reflect on whether carrying out each of the four steps in the cyclical model had been helpful to them: Reflect on the four steps in the cyclical model. Have they been useful to you? How has each step helped you in learning Educational Psychology?

Procedure
Initial reflection on the situation

My observations and findings in the survey of students' reflections and performance in Educational Psychology led me to embark on this attempt to teach students how to self-regulate learning. I felt that the students needed to be given instruction and guidance in the use of SRL strategies if they were to improve in the subject.

Planning for improvement

I decided to introduce my students to the four-step cyclical model of SRL put forward by Zimmerman, Bonner & Kovach (1996). I hoped that the steps in the model would help to facilitate learning and eventually raise their self-efficacy in Educational Psychology as their performance in the subject improved.

Enacting the plan and observing how it works
Enacting the plan
At the beginning of the study, I administered a pre test and following that, a self-efficacy scale, on the students. They were told that the purpose of the pre test and the self-efficacy scale were to find out how much they knew about the Educational Psychology topics and how confident they were in answering questions on the topics. They were also asked to write reflections on how they felt about the subject after completing the pre test and the self-efficacy scale.

This was followed by introduction to the four-step cyclical model of SRL (refer to Appendix B). I gave the students instructions on how to carry out the four steps, namely self-evaluation and monitoring, goal setting and strategic planning, strategic implementation and monitoring, and strategic-outcome monitoring. They were instructed on how to set goals and plan how to study the topics within the eight weeks of the study. A suggested format was given to them (see Appendix B) to help them in monitoring the activities in the cycle. They were also given guidance on how to carry out the planned schedule and do weekly self-monitoring, indicating the learning strategies they used and doing self-check on time management and how well they had mastered the topics. They were required to hand in the completed self-monitoring forms on a weekly basis. With the exception of a few who needed to be reminded from time to time, most of the students gave me their full cooperation in handing in their self-monitoring forms.

At the end of eight weeks, I administered a post test and the self-efficacy scale again to assess the effects of the intervention. I also requested students to write reflections on whether the four steps in the cyclical model of SRL had been helpful to them.

Observing how it works
Table 1 is a summary of the pre and post test results. The pre test results show that 52% of the students were at the 'weak' level of attainment, while 16% were at 'moderate' and only 12% were at 'good'. However, the post test results show a definite improvement in performance with 80% at the 'moderate' level of attainment and the remaining 20% at 'good'.

Table 1. Summary of the pre and post test results

Score	Level of Attainment	Frequency		Percentage	
		Pre	Post	Pre	Post
0-20	Very weak	10	0	40	0
21-40	Weak	8	0	32	0
41-60	Moderate	4	20	16	80
61-80	Good	3	5	12	20
81-100	Very good	0	0	0	0

Regarding students' self-efficacy in Educational Psychology (see Table 2), at the beginning of the study, 40% of them were at the 'low' level of self-efficacy while 32% were at 'moderate' and 28% were at 'high'. But at the end of the study, students' self-efficacy had increased, with only 12% at the 'low' level of self-efficacy while 36% were at 'moderate' and 52% were at 'high' and above.

Table 2. Summary of self-efficacy scores at the beginning and at the end of the study

Score	Level of Self-Efficacy	Frequency		Percentage	
		SE1	SE2	SE1	SE2
0-20	Very low	1	0	4	0
21-40	Low	9	3	36	12
41-60	Moderate	8	9	32	36
61-80	High	7	12	28	48
81-100	Very high	0	1	0	4

Note. SE1 = self-efficacy at the beginning of the study; SE2 = self-efficacy at the end of the study

The findings from content analyses of students' written reflections at the beginning and at the end of the study support the above results. At the beginning of the study, all of the students expressed awareness of the need to put in more effort at studying Educational Psychology. They also realized that they needed to employ certain learning strategies so as to study effectively. Excerpts of 8 randomly selected students' reflections are shown in Appendix C. At the end of the study, students were again asked to write reflections. Five out of the 25 students said that they only benefited from some of the activities in the cyclical model of SRL. Two of them said that goal setting and planning was a waste of time as it didn't work with them. They usually could not keep to what had been planned. Three of them were of the opinion that doing reflections, self-evaluation and monitoring took up a lot of time and didn't really help them to improve much. However, all of them agreed that the use of text organization and transformation strategies (such as making short notes, using mnemonics, constructing concept maps, mind maps, charts/tables, and visualization) contributed to a better understanding

of the topics studied. The rest of the students (20 students) said that they had really benefited from the 4-step activities in the cyclical model of SRL. Excerpts of the same 8 students' reflections are shown in Appendix D.

Reflections

The findings from this study have provided me with some valuable insights on teaching and learning of Educational Psychology. The achievement tests and self-efficacy scale results show that implementation of the cyclical model of SRL has helped students to improve in their attainment and enhance their self-efficacy in Educational Psychology. Students' written reflections support the above findings. Eighty percent of the students said that the use of learning strategies such as goal setting and planning, time management, reflections, self-evaluation and monitoring helped them to keep track of their progress in learning. Meanwhile, the use of text organization and transformation strategies facilitated their understanding and memory for the material learned.

For the five students who did not find the intervention very beneficial, further investigation is in order. Perhaps they need to be given further guidance in carrying out the activities in the SRL cycle. I believe they were not carrying out the activities in the proper manner, and as a result, there was not much improvement in their performance and self-efficacy, thus leading them to conclude that the intervention was not beneficial to them.

The results of this action research show that it is really well worth the effort to inculcate the use of SRL strategies among students. In view of this, students should be encouraged to continue with the cyclical model of SRL as they study other topics in Educational Psychology. Indeed training in self-regulatory practices is going to prove useful to students in the long run as this will equip them with the learning skills for lifelong learning.

In closing, I would like to say that I am glad that I carried out this study. This study has revealed greater insights into the struggles that individual students in my class go through in their efforts to master the content in Educational Psychology. These insights not only create a better understanding between the students and me, but the knowledge I have gained will also serve to guide me in preparing future teaching and learning activities for Educational Psychology classes.

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Appendix A

EDUCATIONAL PSYCHOLOGY SELF-EFFICACY SCALE
_____

Name: _____   M/F:_____   Group: _____

Instructions:
Suppose that you are given the following questions **in an Educational Psychology test**. Please indicate **how confident you are** that you can **answer each question correctly.** You have 30 seconds only to read and indicate your level of confidence for each question. (You don't have to write down the answers!)

It is important that you **do not guess** but give a realistic estimate of whether you can answer the questions correctly. Please use the scale below:
If you are **not confident at all** that you can do it correctly, mark (/) **1**
If you are **completely confident** that you can do it correctly, mark (/) **10**
If the estimate of your confidence is **between 1 and 10**, mark the appropriate number from **2 to 9**.
Please **mark one number only** for each question. **Thank You!**

No.	Question	Confidence Scale
1	List four (4) ways in which Piaget and Vygotsky's ideas on cognitive development differ.	1 2 3 4 5 6 7 8 9 10
2	Write an essay to discuss the views of *teaching as an art* and *teaching as a science*.	1 2 3 4 5 6 7 8 9 10
3	Discuss the key differences between Kohlberg's preconventional, conventional, and postconventional levels of moral reasoning.	1 2 3 4 5 6 7 8 9 10
4	How is knowledge constructed? Discuss the different constructivist views of learning put forward by Vygotsky, Piaget, and theorists of the Information Processing System.	1 2 3 4 5 6 7 8 9 10
5	What steps would you take to process information during learning so as to improve your long-term memory?	1 2 3 4 5 6 7 8 9 10
6	When a child can focus on both width and length of two triangles in order to compare their areas, the child is said to be capable of _____.	1 2 3 4 5 6 7 8 9 10
7	In what ways do experts and novices differ in their knowledge and skills for a particular domain?	1 2 3 4 5 6 7 8 9 10
8	How would you define Educational Psychology?	1 2 3 4 5 6 7 8 9 10
9	You have three low ability students in your class. You believe that given enough time and proper instruction they will be able to catch up with the rest. What teaching approach would you use to help them and how would you go about doing it?	1 2 3 4 5 6 7 8 9 10
10	Compare and contrast behavioral and cognitive views of learning.	1 2 3 4 5 6 7 8 9 10

Appendix B

A Cyclical Model of SRL
(Zimmerman, Bonner & Kovach, 1996)
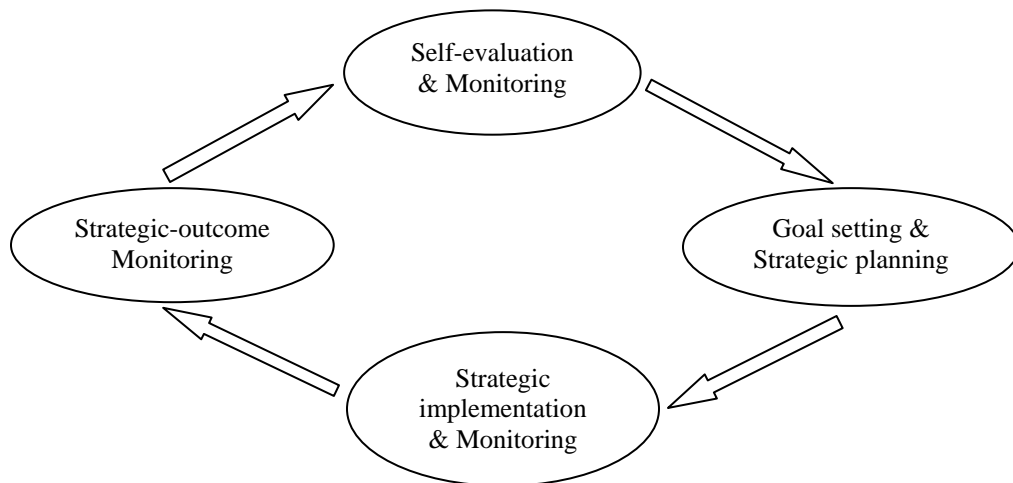
(1) **Self-evaluation & monitoring**:
Reflections on attainment and self-efficacy in Educational Psychology, what steps should be taken to improve in the subject.

(2) **Goal setting & strategic planning**:
Set goals and do strategic planning - how to accomplish the goals, time frame, learning strategies to be used (e.g. make short notes, concept maps/mind maps, mnemonics, self-test, revise several times, use imagery/visualizing, tabulate information, summarize).

(3) **Strategic implementation & monitoring**:
Strategic implementation – carrying out the above plans; monitor time management (the number of hours per day/per week), topics covered, and learning strategies used.

(4) **Strategic-outcome monitoring**:
Reflections on the effectiveness of goal setting and planning and use of learning strategies – whether the strategies used had brought about an improvement in learning.

Form for recording weekly goal setting, planning and self-monitoring:

Date	Time	Topic	Strategies used	Level of Mastery (poor/fair/good)	Self-Check (attainment of time & content goal)

Appendix C

Student reflections at the beginning of the study

Student	Reflections
1	*I realize that I need to change my way of studying and be more serious and more focused. I will re-evaluate my time management and avoid studying 'last minute'. I will apply other learning techniques such as concept mapping, and mnemonics.*
2	*I know that I have done badly in this test. I know it is my own fault. I should do my revision at the end of each day and reflect back on what I've learnt.*
3	*I know I should change my learning style and put in more effort and study harder. I should not just read the book but try to understand and digest the contents.*
4	*I learned that I should study and do revision by myself in order to understand more and better of what I learnt in class. I need to read my book more.*
5	*I learned that I should prepare for the test. Educational Psychology is a tough subject. Lots of new terms need to be understood and memorized. I need to read more and put in lots more effort.*
6	*This shows that I have not fully understood the chapters we studied. I need to revise my method of studying. I plan to re-do my notes and write them based on my understanding. I need to put more effort in my revision.*
7	*I realized that my study skill might be wrong and I am in need of help in looking for a new and effective way to study.*
8	*I realize that educational psychology is a subject that stresses the understanding of facts and not merely memorizing the information. I must use special methods to study to make sure I understand and remember the facts.*

Appendix D

Student reflections at the end of the study

Student	Reflections
1	*Goal setting and planning has done a great deal in improving my study plans. I realize the importance of doing reflections and self-evaluation as this helps me to know my progress. Applying various learning strategies has also been useful to me, more than just rote memorization.*
2	*Setting goals for my revision helped me a lot as I did my revision according to the time planned. Doing reflections and self-evaluation and monitoring has been very useful* in *learning educational psychology. Using some of the learning strategies really worked for me.*
3	*It is very useful. By listing my goal and planning I know what I should do in order to achieve the goal and it enables me to do my revision in an orderly manner. Doing reflections enable me to analyze and flash back on what I have learned. Makes me more organized. The learning strategies are very useful… an effective way of learning.*
4	*Goal setting and planning sets my mind on what to do today, this week, next week, …. Reflections, self-evaluation and monitoring are useful to help me keep track of what I am learning and evaluate myself for areas that need to be improved. I use various learning strategies or techniques during my revision and this has been very useful for me to remember concepts, ideas and terms, especially complex ones.*
5	*I find it very useful in terms of teaching me to manage my time. It also reminds me of the goal that I want to achieve. Doing reflections make me realize that I haven't fulfilled my goals of learning yet and I must work harder.*
6	*It has been useful to set a goal for myself and plan the time though it is difficult to carry out due to unexpected interference. Yes, it (reflections) is useful as it helped me understand more about my study habits and what I need to do. Making my own notes and doing mind maps helped me to understand what I study.*
7	*Goal setting and planning is very useful and it is the proper way to learn. Doing reflections, self-evaluation and monitoring really helps me a lot because I can detect my problems and try to improve more. Using various strategies is definitely very useful and makes learning easier.*
8	*Goal setting was useful to me since it helped me to get motivated and in the mood to study. Doing reflections helped me see where I go wrong so I can do better in the future. The use of those learning strategies helped me to study well.*