

Applying Self-Regulation Models in Online Learning

*Nazihatulhasanah Arbain
naszieha91@yahoo.com*

*Department of Educational Sciences, Mathematics and Creative Multimedia, Universiti
Teknologi Malaysia, Malaysia*

*Nurbiha A. Shukor
nurbiha@utm.my*

*Department of Educational Sciences, Mathematics and Creative Multimedia, Universiti
Teknologi Malaysia, Malaysia*

*Noor Dayana Abdul Halim
noordayana@utm.my*

*Department of Educational Sciences, Mathematics and Creative Multimedia, Universiti
Teknologi Malaysia, Malaysia*

Abstract

Self-regulation can be viewed as a process that can assist students in the learning task to improve learning achievement thus to become a lifelong learners through the ability to plan, monitor and evaluate own learning. Based on previous studies, self regulation learning strategy is usually applied in second language subjects, comprehension task, reading, spelling, Mathematics, and also writing. However, regulation in online learning is difficult to establish hence less studies were found exploring this area. The purpose of this paper is to underline the importance of self regulation in online learning. Self-regulation is found to be important in assissting students to develop their knowledge, skills and strategies and overcome learning difficulties in learning.

Keywords: Self-regulated learning, Online learning, Metacognition

1.0 Introduction

Self-regulation can be viewed as a process that can assist students in the learning task to improve learning achievement thus to become a lifelong learners through the ability to plan, monitor and evaluate own learning. Based on previous studies, self regulation learning (SRL) strategy is usually applied in second language subjects, comprehension task, reading, spelling, Mathematics, and also writing. However, self regulation in online learning is difficult to establish hence less studies were found exploring this area. The purpose of this paper is to underline the importance of self regulation in online learning. It is because self-regulation is found to be important in assissting students to develop their knowledge, skills and strategies and overcome learning difficulties in learning. Bandura (1997) stated that self-regulated learners are the agents of problem solving.

There were many programmes that have been introduced to make the education system in Malaysia produce a number of high quality students. However, it is only focused on reading skills, writing skills and basic study skills. It is not said to be not necessary for the students, but there were lack in conducting the programmes in the classrooms. It can be seen when the results of the achievement Malaysian students in the Program for International

Student Assessment (PISA) and Trends in International Mathematics and Science Study (TIMSS) were a bit disappointed.

The programmes that have been introduced should be a booster in producing a high level of achievement in those international tests, but it is not. How can we maximise the efficiency of the programmes? One of the answers is that the learners themselves should be a strategic and self-regulated in order to control their own learning processes. As self-regulated learning applied in the classroom, it is assumed that the learners will be able to monitor, control and regulate their own learning based on their cognition, motivation and also behavior. Pintrich (2004) stated that it is not expected they can perform metacognitively in every learning process because there might be an interference from the environment and constraints from themselves naturally. Despite of that, they can regulate their own learning whenever possible.

2.0 What Is Self-regulated Learning?

The definition of self-regulation can be different based on the researcher's theoretical orientation and the area of self-regulation they discussed about. According to Zimmerman (2002), self-regulation is not a mental ability or a skill of academic performance; somewhat it is the process of directing the individual themselves in transforming their mental abilities into academic skills. While self-regulated learning strategies are actions and processes directed to obtain an information or skill that involve in achieving learning purpose (Zimmerman, 1989). Self-regulated students will have a certain goals to be accomplished, after the goals have been set, the best strategies will be chosen to help them reach those goals. In the process of achieve those goals, the progress will be monitored and the efficacy of the strategies chosen will be analysed. They might be changing in the learning environment that will need the students to adjust the strategies to adapt it with the learning goals (Winne and Hadwin, 2001). From this statement, we can say that self-regulated learning involves (a) assigning task goals and standards to monitor the task, (b) adopting and adapting tools and strategies to enhance the learning goals in a strategic way, (c) monitoring progress and make a change if the results differ from the expectations, and (d) persisting and adapting in the face of challenges (Winne & Hadwin, 1998; Zimmerman, 1989). In overall, self-regulation is directed by environmental settings that help individuals to adopt, develop, and improve strategies; monitor, evaluate, and set goals; and plan, implement, and change belief processes (Schunk & Zimmermann, 2008).

2.1 Self-regulated Learning Models

The models of self-regulated learning that have been developed by the researchers propose that students can control their own learning process by applying various cognitive, metacognitive, and motivational-emotional strategies in the learning process. These three models are some of the popular models of self-regulated learning.

2.2 Winne and Hadwin's Four-stage Model of Self-regulated Learning

Winne and Hadwin's (1998) four-phase model describes the specific cognitive processes that require a learner's self-regulation through task definition, goal setting, use of tactics to learn, and the metacognitive processes and adapt it to the learning process to achieve the learning goals. This model differs from others in that they theorized the processes occurs in each phase. It is also a complements of other SRL models because they introducing a more complex explanation of the processes underlying each phase. To describe each of the four phases in terms of the interaction

of a person's conditions, operations, products, evaluations, and standards, they are using the acronym COPES.

The overall Phase 1 standards build up the individual's goal. Other than that, it is also can describe the changes from one phase lead to changes in other phases over the learning process effectively. The task conditions refer to information in the environment that the learner attends to that are resources, instructional cues, time and also social context. While cognitive conditions refer to information the learner retrieves from long-term memory. In Figure 1, the bar graph represent how a student actively determines criteria for "success" in terms of each aspect of the learning task, with each bar shows a different standard of qualities or degrees. These standards are used to define the success of any tasks the person might achieve in every phase.

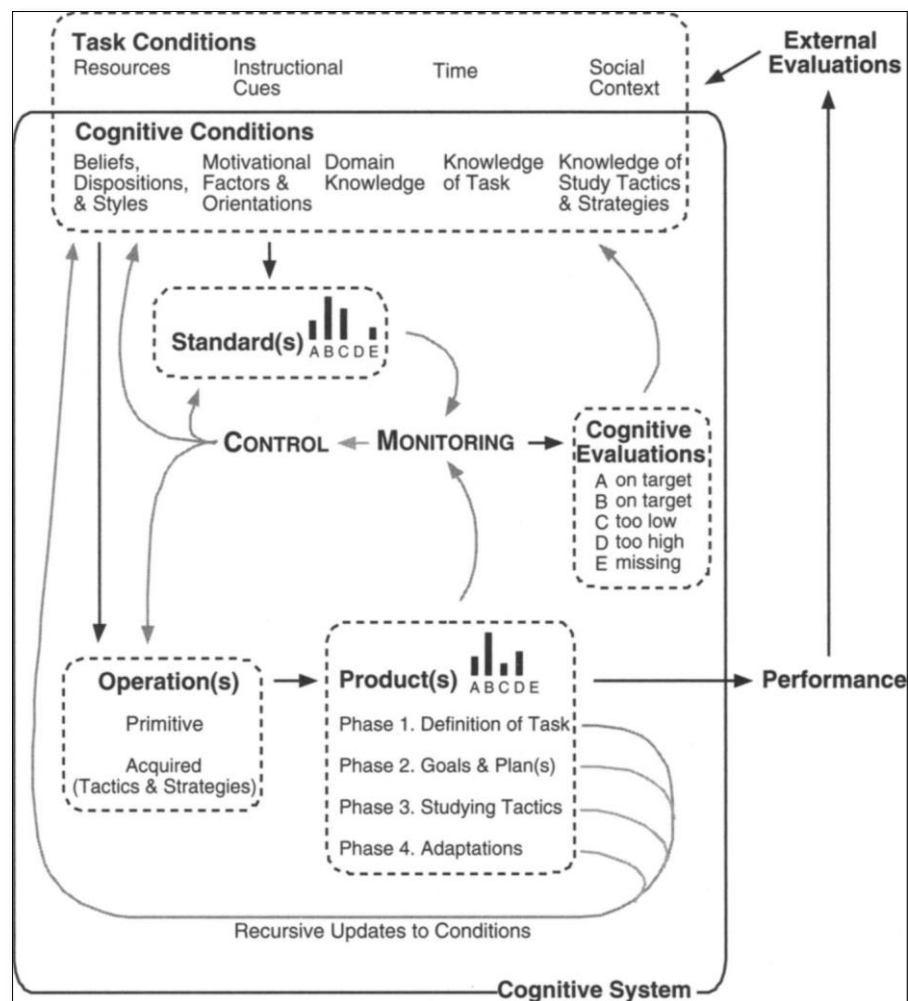


Figure 1 Winne and Hadwin's (1998) model of self-regulated learning. Source. Greene, J. A., and Azevedo, R. (2007). A theoretical review of Winne and Hadwin's model of self-regulated learning: New perspectives and directions. *Review of Educational Research*, 77(3), 334-372.

The second phase is about goal and plans setting. Once goals has been set, the information from the memory will be retrieved. Then, the learner may construct a plan by retrieving tactics and then predicting whether it can match the standards. This require the learner to think metacognitively to monitor their progress thus provide a

base to modify the prior strategy chosen. Or, the result may make the learner to go back to Phase 1 to recheck the task and maybe redefine it.

Phase 3 involve the process of accomplishing the goals once the goals have been set in phase 2. According to Winne, Jamieson-Noel and Muis (2002), Phase 4 in the model is optional. If it is needed, the learner can makes major adaptations to in order to achieve the learning goals. As stated in Rumelhart and Norman's (1978) framework, they describe three forms of adaptations that are accretion, structuring and tuning. Accretion is the addition into the strategy, structuring is creating new concepts and tuning is adjustments to improve the tactics used in the strategies.

2.3 Zimmerman's Social Cognitive Model of Self-regulation

Zimmerman's (2000) model of SRL in Figure 2 shows that it has three cyclical phases, corresponding to before, during, and after SRL takes place that are forethought phase, performance phase and self-reflection phase. The forethought phase is divided into two components: task analysis and self-motivation beliefs. Task analysis include goal setting and strategic planning according to the task given. While self-motivation beliefs comprise self-efficacy, outcome expectations, the tasks' intrinsic value for the student itself, and the learners' learning goal orientation.

In the second phase which is performance, it is characterized by two types of processes that are self-control and self-observation. Self-control refers to engaging strategies the student recognised for the task during the forethought phase. Self-observation refers to self-monitoring on the progress that have been made or ensure they keep on track to perform. Self-observation can be done by recording their own performance in achieving the task by the student (Rosen, Glennie, Dalton, Lennon, and Bozick, 2010).

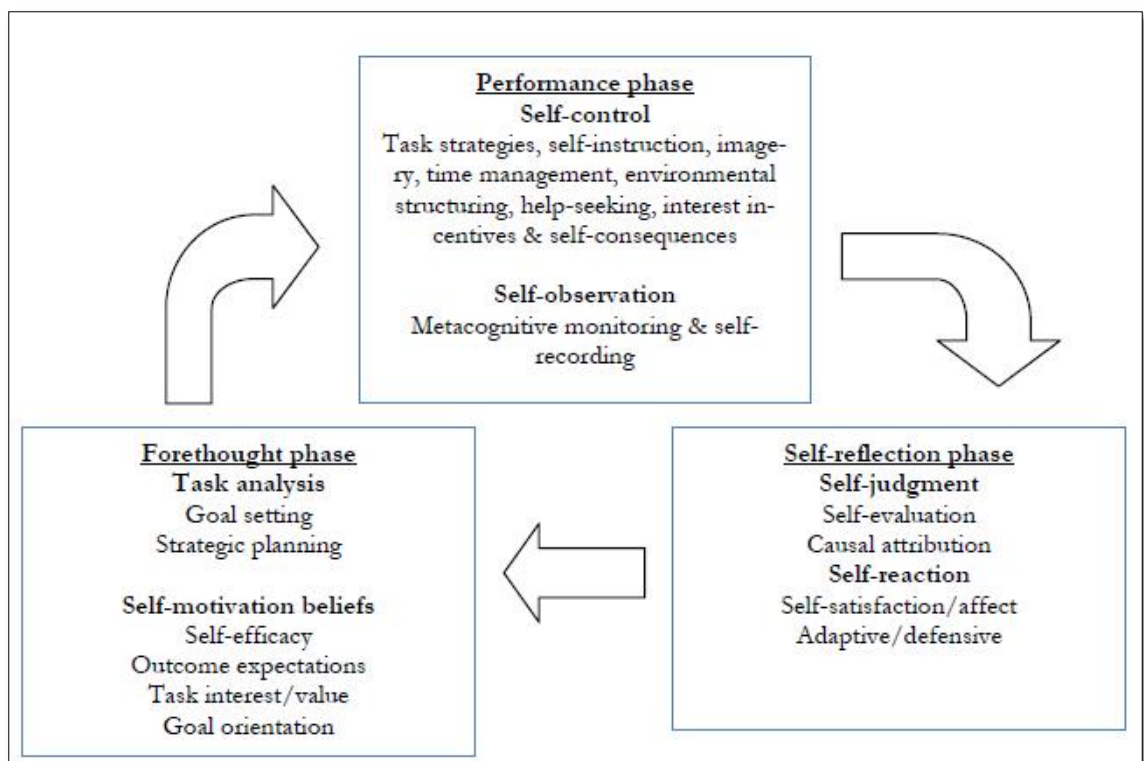


Figure 2 Zimmerman's (2000) cyclical model

The self-reflection phase is the third phase of Zimmerman's (2000) cyclical model. This phase takes place after the SRL event, where self-judgment (comparing individual's performance to others' or a standard) and self-reaction (self-satisfaction or affect to the task performance) are possible to make a change in the variables that have been made up during the forethought phase.

2.4 Pintrich's General Framework for Self-regulated Learning

Pintrich's (2000) framework is shown in table form (Table 1). There are four phases. There are forethought, monitoring, control and reflection phases. In every phase, there are four areas of regulation, containing cognitive, motivational and affective, behavioural and also contextual. Phase 1 consists of planning and goal setting as the activation of perceptions and knowledge of the task and context occur.

Table 1 Phases and Areas for Self-Regulated Learning

Phases	Areas of regulation			
	Cognition	Motivation/ Affect	Behavior	Context
Phase 1 Forethought, planning, and activation	Target goal setting	Goal orientation adoption	Time and effort planning	Perceptions of task
	Prior content knowledge activation	Efficacy judgments	Planning for self-observations of behavior	Perceptions of context
	Metacognitive knowledge activation	Perceptions of task difficulty Task value activation Interest activation		
Phase 2 Monitoring	Metacognitive awareness and monitoring of cognition	Awareness and monitoring of motivation and affect	Awareness and monitoring of effort, time use, need for help	Monitoring changing task and context conditions Self-observation of behavior
Phase 3 Control	Selection and adaptation of cognitive strategies for learning, thinking	Selection and adaptation of strategies for managing, motivation, and affect	Increase/decrease effort	Change or renegotiate task
Phase 4 Reaction and reflection	Cognitive judgments	Affective reactions	Choice behavior	Evaluation of task

In phase 2, he stresses on the monitoring processes that represent metacognitive awareness of the individual, task or context. While in phase 3 involves efforts to

control and regulate different aspects of the self or task and context. Lastly, Phase 4 shows the kinds of reactions and reflections that might be occur on the individual and during the task.

2.5 Comparisons of the Self-regulated Learning Models

Table 2 shows the comparisons between the models. Generally, all the SRL models comprise the phases or stages including planning, monitoring and evaluating. Zimmerman's (2000) model of self-regulation is shown as cyclical because the response from previous performance is used to make any modifications during current efforts. The modifications are needed because personal, behavioral, and environmental factors are always changing during learning process. Compared to the other two models, there were only three phases involved in this model that are forethought, performance control, and self-reflection processes. Among other models of self-regulated learning, Zimmerman (2001) shown to have an outline of common features to most definitions of SRL. First, the students are aware of the processes of self-regulation and how it can be used to improve their learning performance. Secondly the self-oriented feedback loop is exist during learning process. They can monitor the effectiveness of the strategies chosen. The third feature that can be found in most theories of SRL is the motivation aspect.

Table 2 Comparisons of the self-regulated learning models

Models	Winne and Hadwin	Zimmerman	Pintrich
Phases	<ol style="list-style-type: none"> 1. Definition of task 2. Goals and plans 3. Studying tactics 4. Adaptations 	<ol style="list-style-type: none"> 1. Forethought 2. Performance 3. Self-reflection 	<ol style="list-style-type: none"> 1. Forethought 2. Monitoring planning, and activation 3. Control 4. Reaction and reflection
Preparatory phase	Task definition, goal setting, planning	Forethought (task analysis, self-motivation)	Forethought, planning
Performance phase	Applying tactics and strategies	Performance (self-control, self-observation)	Monitoring, control
Appraisal phase	Adapting metacognition	Self-reflection (self-judgement, self-reaction)	Reaction and reflection
Form		Cyclical	Table

Pintrich (2000) analysed the role of motivation in SRL further in his model. More precisely, he discussed how the goal orientations are related to SRL. There are also four phases in this model that are forethought, monitoring, control and reflection. Winne and Hadwin (1998) also propose a multiphase model of SRL, but they provide a more detailed analysis of what happens within each phase, and also the connection between the phases. The four phases are task definition, goal setting and planning, studying tactics, and adaptations.

Pintrich's and Zimmerman's models resemble each other compared to Winne and Hadwin's. They describe SRL as a goal-oriented process, taking place from a forethought phase through self-monitoring towards self-reflection. The conceptions of Winne and Hadwin's is rather different; even if they generally agree on the explaining of the SRL process, the emphasize on each component in the model is quite different. It can be said, it quite complicated than the other two models.

3.0 Self-regulation in Online Learning

Self-regulated learners tend to achieve more positive academic outcomes than individuals who do not practicing self-regulated learning behaviours. Learners engage in self-regulation by motivating themselves using appropriate learning strategies, managing time, setting learning goals, self-reflecting on their performance, and delaying gratification throughout task completion (Ramdass and Zimmerman, 2011). The self-regulated learning behaviours are a function of an individual's desire to accomplish their learning goals. Self-regulated learning skills and strategies appears as a function of personal, behavioural, and environmental factors to adjust, modify, or change as the phases involved are related to each other (Barnard-Brak, Paton, and Lan, 2010). When dealing with the educational technology tools such as hypermedia, web and intelligent tutoring systems, students might face frustration, confusion or hopelessness if the tools seem not helps them achieve the learning goals. In this case, the teachers play an important role in providing the best tools and select the appropriate strategies to make the learning process meaningful and the learning goals can be achieved. There are some researches that applying technology in producing self-regulated learners such as Poitras, Lajoie and Hong (2012), Liaw and Huang, (2013) and Chan (2012).

The time allocated for study must be managed effectively to ensure a good academic performance. To make sure the students regulate their study time, the teachers should tell the students that time is important to boost learning performance because when they face insufficient time in solving tasks, it would affect their emotion (Zimmerman, Bonner and Kovach, 1996). According to Thiede and Dunlosky (1999), if the learner can monitor their learning progress accurately, they can allocate more time to study about the less understand learned subject so that the learning performance can be improved. Zimmerman, Bonner and Kovach (1996) have conducted an experiment on time management, they monitored how the students spend their time for study and discovered that the students are unaware the how much time they waste, underestimate the time they need to spend to complete the task, less efficient with time as they planned. It can be said that an effective time management need a strategic planning and discipline to achieve a better learning performance and improved self-efficacy.

One the factor that stimulates, leads, and sustains increased performance is motivation (Duttweiler, 1986). SRL is most frequently discussed in relation to motivation. Motivation is a highly correlated non-cognitive skill, and most researchers would argue it is an integral component of self-regulation, empirically and theoretically (Rosen et al., 2010). There are two types of motivation that are intrinsic and extrinsic motivation. Deci and Ryan (1985) believed that when the students are instrinsically motivated, they are better because they are prepared to encounter whatever challenges they would face to attain a fulfillment in solving a

task given. While the students with extrinsic motivation would try to run away from solving the tough task to avoid punishment or receive rewards. The research by Chang and Lehman (2002) by using an instructional computer-based language-learning program found that students who were more highly intrinsically motivated show a better academic performance and they were more enthused.

When the learners monitor their own behavior and analyse the effectiveness of the learning strategies, they can improve their motivation to continue and sustain the methods of learning used. Apart from that, a self-regulated students were not only success in their academic performance but also believe that their future will be better because of they were highly motivated and adapted to their own learning methods (Zimmerman, 2000).

One of the aspects of motivation is the students' participation in a task (Pintrich and Zusho, 2007). They assume that learners will be motivated when they put a great effort in solving tasks, or be an active participant in the classroom. The behavior of the students' engagement can be seen by taking notes activity, asking questions freely, not afraid in give their own opinion or ideas, discussing with the friends, spending extra time on studying and try to find additional information outside the classroom. All this activity can be applied by teachers to adapt the students with the self-regulated learning environment.

4.0 Summary

Self-regulated learning is found to be important to enhance learning performance better. However, there is less research found in applying self-regulated learning in online learning environment. There are three popular models in explaining self-regulated learning that are Winne and Hadwin's (1998), Zimmerman's (2000) and Pintrich's (2000). Generally, self-regulated learning comprises three phases; planning, monitoring and evaluating. Students who are self-regulated individual shows higher achievement than the students who did not applying self-regulation in learning process. They are improved in self-motivation and time management of learning. When they are highly motivated and their learning is managed effectively, their learning performance would be excellent. Thus, further research should be conducted to prove that applying self-regulated learning in online learning show a very positive impact in students' learning performance.

References

- Barnard-Brak, L., Paton, V. O., & Lan, W. Y. (2010). Self-regulation across time of first-generation online learners. *Research in Learning Technology*, 18(1).
- Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behavior*. Springer Science & Business Media.
- Duttweiler, P. C. (1986). Educational excellence and motivating teachers. *The Clearing House*, 59(8), 371-374.
- Pintrich, P. R. (2000). The role of goal orientation in self-regulated learning. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation* (pp. 451–502). San Diego, CA: Academic.
- Pintrich, P. R., & Zusho, A. (2007). Student motivation and self-regulated learning in the college classroom. In *The scholarship of teaching and learning in higher education: An evidence-based perspective* (pp. 731-810). Springer Netherlands.
- Ramdass, D. & Zimmerman, B. (2011), *Journal of Advanced Academics* Prufrock Press, Inc. ,Vol. 22, No. 2, pp. 194-218
- Rosen, J. A., Glennie, E. J., Dalton, B. W., Lennon, J. M., & Bozick, R. N. (2010). *Noncognitive Skills in the Classroom: New Perspectives on Educational*

Research. RTI International. PO Box 12194, Research Triangle Park, NC 27709-2194.

- Rumelhart, D. E., & Norman, D. A. (1981). Analogical processes in learning. *Cognitive skills and their acquisition*, 335-359.
- Thiede, K. W., & Dunlosky, J. (1999). Toward a general model of self-regulated study: An analysis of selection of items for study and self-paced study time. *Journal of experimental psychology: Learning, Memory, and Cognition*, 25(4), 1024.
- Winne, P. H., & Hadwin, A. F. (1998). Studying as self-regulated learning. *Metacognition in educational theory and practice*, 93, 27-30.
- Winne, P. H., & Hadwin, A. F. (2008). The weave of motivation and self-regulated learning. *Motivation and self-regulated learning: Theory, research, and applications*, 297-314.
- Winne, P. H., Jamieson-Noel, D., & Muis, K. (2002). Methodological issues and advances in researching tactics, strategies, and self-regulated learning. *Advances in motivation and achievement: New directions in measures and methods*, 12, 121-155.
- Zimmerman, B. J., & Schunk, D. H. (2008). An essential dimension of self-regulated learning. *Motivation and self-regulated learning: Theory, research, and applications*, 1.