MODELS OF SELF-REGULATED LEARNING: A REVIEW OF LITERATURE

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Abstract

Self-regulated learning (SRL) includes the cognitive, metacognitive and motivational aspect of learning. SRL has become one of the most important area of research within the educational psychology. In this paper, Model of SRL are analyzed and compared. The review reaches main conclusion that is the students can be taught with self-regulated learning model to be more strategic and successful. There are differential effects of SRL model in light of differences in student's developmental stage.

Keyword: SRL, Cognitive, Meta-cognitive, Motivation.

Background of Self-Regulated Learning

Self-regulated learning (SRL) includes the cognitive, metacognitive, behavioral, motivational, and emotional/affective aspects of learning. It is also seen that a number of variables e.g., self-efficacy, volition, cognitive strategies that influence self-regulated learning. For that reason, now a days SRL has become one of the most important areas of research within educational psychology.

The concept of self-regulated learning emerged from Albert Bandura's seminal theory of self-efficacy which was later incorporated into social cognition theory in 1980s. While studying children, Bandura (1977, 1997) found that their beliefs about their self-efficacy and how they could self-regulate their thoughts and behavior. Self-regulated learning refers to our ability to understand and control our learning ability. A person with greater self-regulation were able to learn more, which in turn enhanced their sense of self-efficacy. Bandura (1986) recommended specifically that teachers focus on these three practices to foster students' self-efficacy and learning: first, their self-observation and self-monitoring of their performance; second, their self-evaluation of their performance against their personal standards and values, referential performances (models), and the determinants of performance; and third, their

cognitive, affective, and tangible responses to their performance evaluations, including self-correction. Self-regulation refers to self-created thoughts, feelings and actions that are planned and cyclically adapted to the attainment of personal goals (Zimmerman, 2000). Theories of self-regulation have been developed and applied in the field of clinical psychology and the management of chronic conditions, but this chapter focuses on theories of self-regulation as they relate to learning.

In the general discourse of the term self-regulation means self-control or self-discipline. However, research into self-regulated learning shows that how learners regulate their concentration during learning. Self-regulated learning includes processes such as: 'goals setting for learning, attending to and concentrating on instruction, using effective strategies to organize, code and rehearse information to be remembered, establishing a productive work environment, using resources effectively, monitoring performance, managing time effectively, seeking assistance when needed, holding positive beliefs about one's capabilities, the value of learning, the factors influencing learning and the anticipated outcomes of actions, and experiencing pride and satisfaction with one's efforts. Theories of self-regulation have been developed and applied in the field of clinical psychology and the management of chronic conditions, but this chapter focuses on theories of self-regulation as relate to learning.

Component of self-regulated learning

Researchers found that self-regulated learning includes three main components; cognition, meta-cognition and motivation. Cognition refers skills to encode, memorize and recall information. Meta-cognition refers skills that enable learners to understand and monitor cognitive process. Motivation refers beliefs and attitudes that affect the use and development of cognitive and meta-cognitive skills.

Cognition

The cognitive component includes five components such as encoding, organization, elaboration and inferencing. Encoding is our ability to process information currently in working memory in order to store it in long-term memory. Working memory is temporary memory and limited in capacity, whereas long-term memory is permanent memory and unlimited in capacity. Organization refers to how information is stored and arranged in long-term memory. Moat researcher argue that information in long-term memory is organized into knowledge structures called schemata and scripts. A schema is an organized mind of declarative knowledge i.e stateable, factual or conceptual knowledge. Elaboration is an individual ability

to embellish new information by linking it to information in long term memory. Elaboration may occur at shallow or deep level. Inferencing is an individual ability to infer new information from existing knowledge from existing knowledge and information.

Meta-cognition

Meta-cognition includes two main subcomponents such as knowledge of cognition and regulation of cognition. Knowledge of cognition refers to what we know about our cognition. It includes three subcomponents; declarative knowledge, procedural knowledge and conditional knowledge. Declarative knowledge refers to knowledge about ourselves as learners and what factors influence our performance. Procedural knowledge refers to knowledge about strategies and other procedures. Conditional knowledge refers to knowledge why and when to use a particular strategy. Regulation of cognition includes at least three components such as planning, monitoring and evaluation. Planning involves the selection of appropriate strategies and the allocation of resources. It also includes goal setting, activating relevant background knowledge and budgeting time. Evaluation refers to apprising the process of one's learning.

Motivation

The motivation includes four subcomponents such as self-efficacy, attributions, goal orientations and intrinsic motivation. Self-efficacy is the degree to which an individual is confident that s/he can perform a specific task or accomplish a specific goal. Attributions is casual explanations of events that happen in our lives. Goal orientations refers about ability and how those beliefs proposed that learners. Intrinsic motivation refers to behaviors that are engaged in for their own sake. External motivation refers to behaviors that are performed to achieve some externally.

Models of Self-Regulated Learning

Pressley's good information processor model

The good information processor model was developed to explain effective strategy use. There are five main characteristics in this model. 1) a broad repertoire of strategies, 2) meta-cognitive knowledge about why, when and where to use strategies, 3) a broad knowledge base that is relevant to the task at hand, 4) the ability to eliminate unwanted distractions, 5) automaticity in the four components mentioned previously.

There is two different types of strategies, first one is domain-specific strategies, which are appropriate only for a specific task. The second type is a higher-order strategy, which is need to control other lower strategies.

The second characteristics is what experts call conditional knowledge; that is knowledge about when, why and where to use strategies in an optional fashion. Conditional knowledge is important because knowing how to do something is of little practical use unless one also knows when to do it. The third characteristics is a broad knowledge base that is extremely difficult and time-consuming without supporting knowledge already in long-term memory. Fourth characteristics is the ability to eliminate unwanted distractions. It refers to action control. Students are able to motivate themselves in different way. The fifth characteristics is automaticity of the four previous characteristics. Automaticity refers to being able to perform a task or retrieve information from memory with little conscious effort.

Zimmerman: A Socio-cognitive Perspective of SRL Grounded by Three Models

Zimmerman was one of the first SRL authors who developed three different SRL models, being the first one published in 1989. The first model, known as the Triadic Analysis of SRL, represents the interactions of three forms of SRL: environment, behavior and person level (Zimmerman, 1989). This model describes how SRL could be envisioned within Bandura's triadic model of social-cognition. The second model represents the Cyclical Phases of SRL, which explains at the individual level the interrelation of metacognitive and motivational processes. Finally, in Zimmerman and Moylan (2009) tweaked the model with new metacognitive and volitional strategies in the performance phase. In 2000, Zimmerman developed third model, recently which has been called the Multi-Level model, represents the four stages in which students acquire their self-regulatory competency.

Zimmerman (2000) suggested three cyclical phases for the processes of *self-regulation: forethought, performance or volitional control, and self-reflection.*
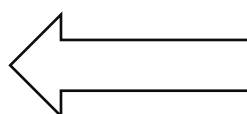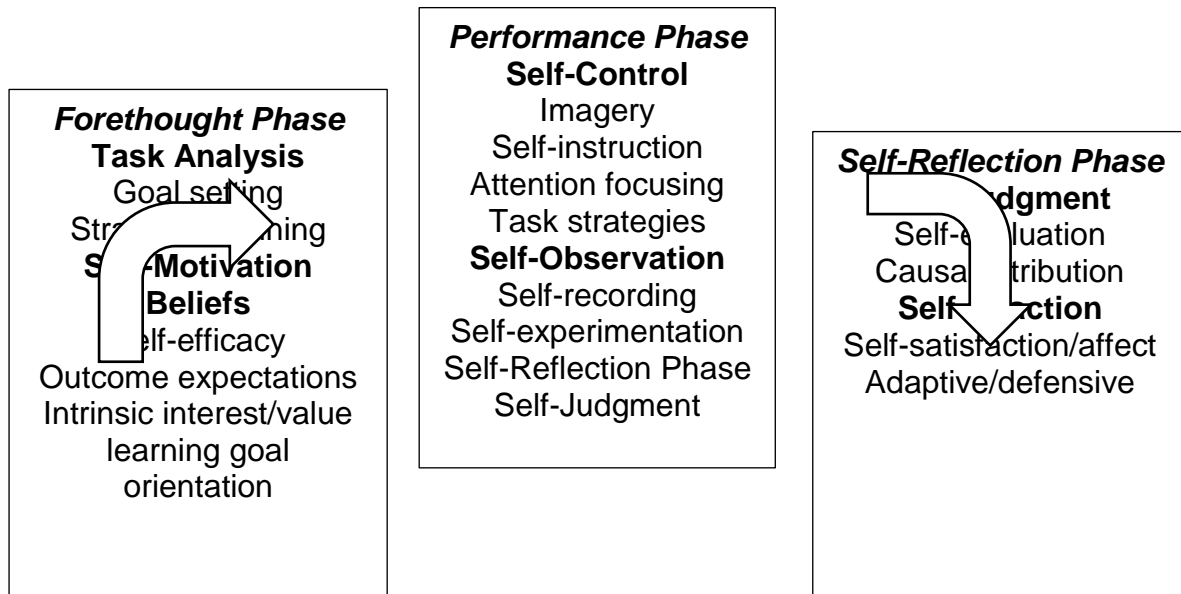
Forethought Phase

The forethought phase mainly encompasses two major part (a) Task analysis (b) self-motivation. Task analysis have two part; goal setting and strategic planning. There is considerable evidence increase academic performance by learner who set a goal and strategic planning. Self-motivation involves self-efficacy, outcome expectations, intrinsic interest/value, learning goal orientation. Self-efficacy refers to beliefs about capacity to learn. Outcome expectations refers to personal consequences of learning. Intrinsic interest involves the students' valuing of the task skill and learning goal orientation involve valuing the process of learning for its own merits.

Performance Phase

Performance phase encompasses two major parts. (a) Self-control (b) self-observation. Self-control refers to the development of selected specific task during the forethought phase. It involves imagery, self-instruction, attention focusing and task strategies. Self-observation refers to ones' cognitive tracking of personal functioning. It involves self-recording, self-experimentation.

Self-Reflection Phase

Self-reflection Phase encompasses two major part of self-reflection phase process. (a) self-judgment (b) self-reaction. Self-judgment involves self-evaluation and causal attribution. Self-evaluation **r**efers to comparisons between prior self-observed performance and present self-observed performance. Causal attribution refers to beliefs about the cause of one's error or successes. Self-reaction involves feelings of self-satisfaction and positive affect regarding own performance. It also involves adaptive/defensive reaction responses. Adaptive reactions refer to adjustment learning strategy. Defensive reactions refer to efforts to protect him/her self-image by avoiding opportunities to learn and perform.

Forethought Phase
Task Analysis
Goal setting
Strategic planning
Self-Motivation Beliefs
Self-efficacy
Outcome expectations
Intrinsic interest/value
learning goal
orientation

Performance Phase
Self-Control
Imagery
Self-instruction
Attention focusing
Task strategies
Self-Observation
Self-recording
Self-experimentation
Self-Reflection Phase
Self-Judgment

Self-Reflection Phase
Self-Judgment
Self-evaluation
Causal attribution
Self-Reaction
Self-satisfaction/affect
Adaptive/defensive

Pintrich's framework for Self-Regulated Learning

Pintrich (2004) stated that there are four phases of self-regulation, namely (a) forethought, planning and activation; (b) monitoring; (c) control; and (d) reaction and reflection. In each of these phases there four factors that involve in learning process, namely cognition, motivation, behavior and context.

Phases	Areas of self-regulation			
	Cognition	Motivation/affection	Behavior	Context
Forethought, planning and activation	-Target goal setting -Prior content knowledge activation -Metacognition knowledge activation	-Goal orientation adoption -Efficacy judgment -Ease of learning judgments (EOLs); perception of task difficulty -Task value orientation -Interest activation	-Time and effort Learning. -Planning for self-observations behavior	-Perception of task -Perception of context
Monitoring	Metacognitive Awareness and monitoring of cognition	Awareness and monitoring of motivation and affect	Awareness and monitoring of effort, time use, need for	Monitoring changing task and context conditions
Control	Selection and adaptation of cognitive strategies for learning, thinking	Selection and adaptation of strategies for managing motivation and affect	Increase/ decrease effort	Change/ renegotiate task
Reaction and Reflection	Cognitive judgments Attribution	Affective reaction Attribution	Choice behavior	Evaluation of task Evaluation of context

Table 1.1: Pintrich's framework (2004) for Self-Regulated Learning

Albert Bandura Social cognitive theory of self-regulation

In 1991, Albert Bandura had developed social cognitive theory of self- regulation. According to Bandura, Human behavior is extensively motivated and regulated by the ongoing exercise of self-Influence. The major self-regulative mechanism operates through three principal sub-functions. These sub-functions include self-monitoring of one's behavior its determinants, and its effects; Judgment of one's behavior in relation to personal standards environmental circumstances; and affective self-reactions.

Self-observation	Judgmental process	Self-reaction
	Personal standards	
	Level	
Performance dimension	Explicitness	
Quality	Proximity	
Productivity	Generality	
Originality	**Referential Performances**	**Evaluation self-reaction**
Sociability	Standard norms	Positive
Morality	Social compression	Negative
Deviancy	Self-compression	**Tangible self-reaction**
Quality of monitoring	Collective composition	Rewarding
Informativeness	**Valuation of activity**	Punishing
Regularity	Valued	**No self-reaction**
Proximity	Natural	
accuracy	Devalued	
	Performance determinants	
	Personal external	

Table 1.2: Structure of the system of self-regulation of motivation and action through internal standards and self-reaction.

Self-Monitoring Sub functions

Individual can give much attention to their own performance then s/she can influence their own motivation very well. Therefore, success in self- regulation partially depends on the fidelity, consistency, and temporal proximity of self-monitoring. Self-monitoring of behaviour that bears on personal competency and self-esteem. Self-observation serves at least two important functions in the process of self-regulation. It provides the information needed for setting realistic goals and for evaluating one's progress towards them. Systematic self-observation can provide important self-diagnostic information. Individual start to notice recurrent pattern when they observe their thought patterns, emotional reaction, behaviour. There are number of factor influencing self-monitoring such as the attribute of individuals, others to behaviour.

Judgmental process

Personal standards for judging and guiding one's action play a vital role in the exercise of self-directedness. Judgmental process of self-regulation concern, personal standards, referential performance, valuation of activity and performance determinations. Performance is regarded favorably or negatively, it depends upon the personal standards.

Behavior is easier to regulate when it produces objective indicates of adequacy. Most activities, there are no absolute measures of adequacy. Therefore, individuals must evaluate their performances in relation to the attainments of others e.g. a student who achieves a score of 115 points on an examination and whose aspirations to be in the upper 10% of a certain group, would have no basis for meaningful self-appraisal without knowing how others have performed.

Self-reaction

Self-reactions provide the mechanism by which regulate course of action. It comprises evaluating self-reaction (positive and negative), tangible self-reaction (rewarding and punishing), no reaction. The self-regulatory control is achieved by creating incentive for one's own action and behavior depending on how it measures up to an internal standard. People who rewarded their own attainments, usually accomplish more than those who perform the same activities under instruction but without self-intensive, are rewarded none contingently, or monitor their own behavior and set goal for themselves without rewarding their attainment.

Winne's self-regulated learning Model

Winne's et. all was stated four stages in the self-regulated learning process, including 1) defining the task 2) planning and goal setting 3) enacting tactics 4) adapting meta cognition Step one refers to two subcomponents, task conditions and cognitive conditions that support self-regulated learning. Task condition refers to factors external to the learner such as time, instructional cues, availability of resources. Cognitive conditions refer to factors internal to the learner that affect performance. Second step consist of planning and goal setting. In this step, learners evaluate task and cognitive conditions information to establish their main goals. Step three consists of selecting and coordinating a wide variety of cognitive learning strategies based on the goals and standards that have set previously. These include information search strategies such as retrieving information from long term memory, information management such as identifying and summarizing information, helping from teachers. Step four consists of using meta- cognition knowledge, particularly monitoring, evaluating performance. Meta cognition

knowledge includes conditional knowledge about cognitive strategies, knowledge about task, knowledge about the task, knowledge about one's current knowledge and interests. Meta-cognitive monitoring includes judgement of performance and generating feedback to correct comprehension errors.

Conclusion

The model of self-regulated learning described above consist with cognitive, meta-cognitive and motivational components. Pressley's Good information processor Model emphasized on the components of self-regulated learning while Winne emphasized on sequential learning of self-regulated learning process. Zimmerman emphasized the cyclic nature of the self-regulate learning process. While Bandura was discussed about the human behavior which is extensively motivated and regulated by the ongoing exercise of self-Influence. Good self-regulators have developed the skills and habits to be effective learners. Self-regulated learning strategies help to make a lifelong learner. Self-regulated learners have to capacity to transfer skills, knowledge and ability from one domain or setting to another.

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