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SELF-REGULATED LEARNING: THEORETICAL MODELS AND THEIR RELEVANCE IN SECONDARY SCHOOL EDUCATION

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Abstract: This study investigates self-regulated learning models and their significant role in secondary school education. The National Education Policy (NEP) 2020 emphasizes the development of self-regulated learning and skill-based programmes at the senior secondary level. Self-regulated learning is an autonomous approach that promotes learners' independence. Self-regulated learning is a process in which the learner controls their cognitive, motivational, and behavioral strategies to achieve academic goals. Barry J. Zimmerman identifies three phases of SRL: the forethought phase, the performance phase, and the self-reflection phase. This capability is characterized by its unique feature that facilitates the acquisition of new knowledge and skills. Self-regulated learning is a process in which the learner controls their cognitive, motivational, and behavioral strategies to achieve academic goals. Barry J. Zimmerman identifies three phases: the forethought phase, the performance phase, and the self-reflection phase. These phases involve goal setting, self-decisions, planning of strategies, self-monitoring, and self-evaluation. Furthermore, the theoretical model can be applied to learning environments, including online, offline, and blended classrooms in senior secondary education. In this paper, the researcher studies the importance of self-regulated learning in the Indian school system. This paper emphasizes self-regulated learning and the importance of enhancing students' academic performance and lifelong learning skills in secondary education.

Keywords: self-regulated learning, NEP2020, Secondary Education, Academic achievement.

1. Introduction

We are living in the era of technology and AI. The credit for this transformation goes to education. Human development depends on education. Education plays a significant role in human development and society. Education makes humans unique compared with other creatures. India has been the center of education since ancient times. In ancient times, education was distinct based on the gurukul system. It was both practical and theoretical. Students lived in the gurukul with their teachers, the guru. They learned many subjects, including mathematics, language, geometry, and medicine. Moral values and discipline were very important for students. Now, we have moved to the 21st century. In this era, students learn with computers and AI. Self-regulated learning (SRL) plays a significant role in the modern education system. It involves various aspects of learning, such as computerized studies and AI-based learning. Self-regulated learning provides learning autonomy to

students, and they are not dependent on anyone, which this is a unique way of learning, which we call self-regulated learning. Self-regulated learning makes learners independent and improves their academic achievement. Self-regulated learning is becoming more and more important in secondary schools (Istance and Dumont, 2010). SLR is not a new theory, but we have been using this technique since ancient times. According to SLR, learners are independent and capable; they can learn new things easily without any support because they are more motivated by themselves. A key component of student learning and academic achievement in a classroom setting is self-regulated behavior and thought (Corno and Mandinach, 1983; Corno and Rohkemper, 1985). There are several definitions of self-regulated learning, which highlight various elements of SRL; these elements appear to be particularly crucial for academic success. Students' metacognitive techniques for organizing, observing, and adjusting their thought processes are part of self-regulated learning (e.g., Brown, Bransford, Campione, & Ferrara, 1983; Corno, 1986; Zimmerman & Pons, 1986, 1988). Second crucial element has been suggested to be the administration and control of students' effort on academic assignments in the classroom.

The actual cognitive techniques that students employ to learn, retain, and comprehend the material are a third crucial component of self-regulated learning that some researchers have incorporated into their conception (Corno & Mandinach, 1983; Zimmerman & Pons, 1986, 1988). In this study, these three elements made up our working definition of self-regulated learning. To encourage student achievement, however, understanding cognitive and metacognitive strategies and control their effort and thought processes (Paris, Lipson, & Wixson, 1983; Pintrich, 1988, 1989; Pintrich, Cross, Kozma, & McKeachie, 1986). There is evidence that suggests students' perception of the classroom, as well as their individual motivation orientations and beliefs about learning, are relevant to cognitive engagement and classroom performance even though there are relevant to cognitive engagement and classroom performance, even though there are classroom situations and tasks that can foster motivation cf. Corno & Rohkemper, 1985; Malone, 1981).

2. Literature Review

Loyens & Rikers (2008) The study investigated the role of self-directed learning (SDL) and problem-based learning (PBL) and examined how SDL related to self-regulated learning. It was explained how SDL is implemented in a PBL environment. Research found the importance of self-regulated learning

Lim Leong Che (2010) examined peer learning, self-regulated learning, and academic achievement in blended learning course. The study was conducted to determine the influence of peer learning and self-regulated learning (SLR) strategies on students' academic achievement. The data was collected using 347 students. The instrument used was an online questionnaire, adapted from a pre-existing, reliable multi-item instrument. Structural equation model (SEM) analysis was used to examine the relationship between the constructs in the hypothesized model. Given that the structural model exhibited a good fit to the data, the results revealed that students' ability to learn with peers had a positive and significant effect on academic achievement.

Kirmizi (2013) analyzed the self-regulated learning habits of distance learners. This study investigated self-regulated learning in terms of goal setting, environment structuring, time management, help seeking, self-evaluation, and metacognition. Explored that self-regulated learning can be defined as a process where learners take the initiative, with or without the guidance of others. In identifying their own needs, formulating a goal, exploring resources, focusing on appropriate learning strategies, and evaluating the learning outcome. The number of participants was 75. Results indicated that distance education learners must improve themselves in terms of their self-regulated habits.

Thebald (2021) explored self-regulated training programs that enhance university students' academic performance, self-regulated learning strategies, and motivation, a meta-analysis. The findings of the study reported that predicted larger training effects for metacognitive and resource management strategies, as well as motivation. Cooperative learning arrangement predicted a larger training effect for cognitive and metacognitive strategies. The provision of learning protocols predicted a larger training effect for resource management strategies. Moreover, training programs based on a metacognitive theoretical background have higher effect sizes for academic achievement compared to training programs based on cognitive.

3. Research gap

Although self-regulated learning (SRL) has been widely examined in educational psychology, much of the existing research is grounded in Western contexts and higher education settings (Zimmerman, 2002; Pintrich, 2000). Studies focusing on adolescents, particularly in secondary schools, remain limited, even though this stage is critical for developing autonomy and lifelong learning skills. In the Indian context, research on SRL is still emerging and has not been systematically connected with recent policy frameworks such as the National Education Policy (NEP) 2020, which emphasizes learner-centered pedagogy, critical thinking, and directed learning. Furthermore, various theoretical models of SRL, such as Zimmerman's cyclical model, Pintrich's framework, and Winne & Hadwin's model, are well established. Their comparative applicability and relevance for Indian secondary school learners have not been sufficiently explored. This gap highlights the need for a theoretical analysis that contextualizes an SRL model within the secondary school system in India, thereby offering insights for teachers, curriculum designers, and policymakers.

4. Concept of self-regulated learning theory

In general, students can be described as self-regulated to the degree that they are metacognitive, motivationally, and behaviorally active participants in their own learning process (Zimmerman, 1986, 1989). Such students personally initiate and direct their own efforts to acquire knowledge and skill rather than relying on teachers, parents, or other agents of instruction. To qualify specifically as self-regulated in my account, students' learning must involve the use of specified strategies to achieve goals on the basis of self-efficacy perception. This definition assumes the importance of three elements: students' regulated learning strategies, perception of performance skill, and commitment to academic goals.

5. Definition of self-regulated learning

"Self-regulated learning is the degree to which students are metacognitively, motivationally, and behaviorally active participants in their own learning process Zimmerman, 1989.

"Self-regulated learning is an active, constructive process whereby learners set goals for their learning and then attempt to monitor, regulate, and control their cognitive, motivation, and behavior." Pintrich, 2002.

"Self-regulated learning is a process in which learners use feedback to monitor and control their cognitive strategies, motivation, and resources in the pursuit of learning goals, Winne & Hadwin, 1998.

6. Methodology

This paper adopts a theoretical and conceptual approach. It is based on an extensive review of literature, including books, journal articles, and policy documents related to self-regulated learning. The study synthesizes various theoretical models, such as those proposed by Zimmerman, Pintrich, and Winne & Hadwin, and analyzes their relevance in the context of Indian secondary school education. No primary data has been collected; instead, the paper relies on secondary sources and theoretical analysis to draw conclusions and provide recommendations.

7. Zimmerman's Cyclical Phases Model

Zimmerman's 2009 SRL model is organized into three phases: forethought, performance, and self-reflection. In the forethought phase, students analyze the task, set goals, plan how to achieve them, and draw on motivational beliefs that energize the process and influence the activation of learning strategies. In the performance phase, students execute the task while monitoring their progress and employing self-control strategies to maintain cognitive engagement and motivation to complete it. They make attributions about their success or failure. These attributions generate self-reactions that can positively or negatively influence how students approach the task in later performances.

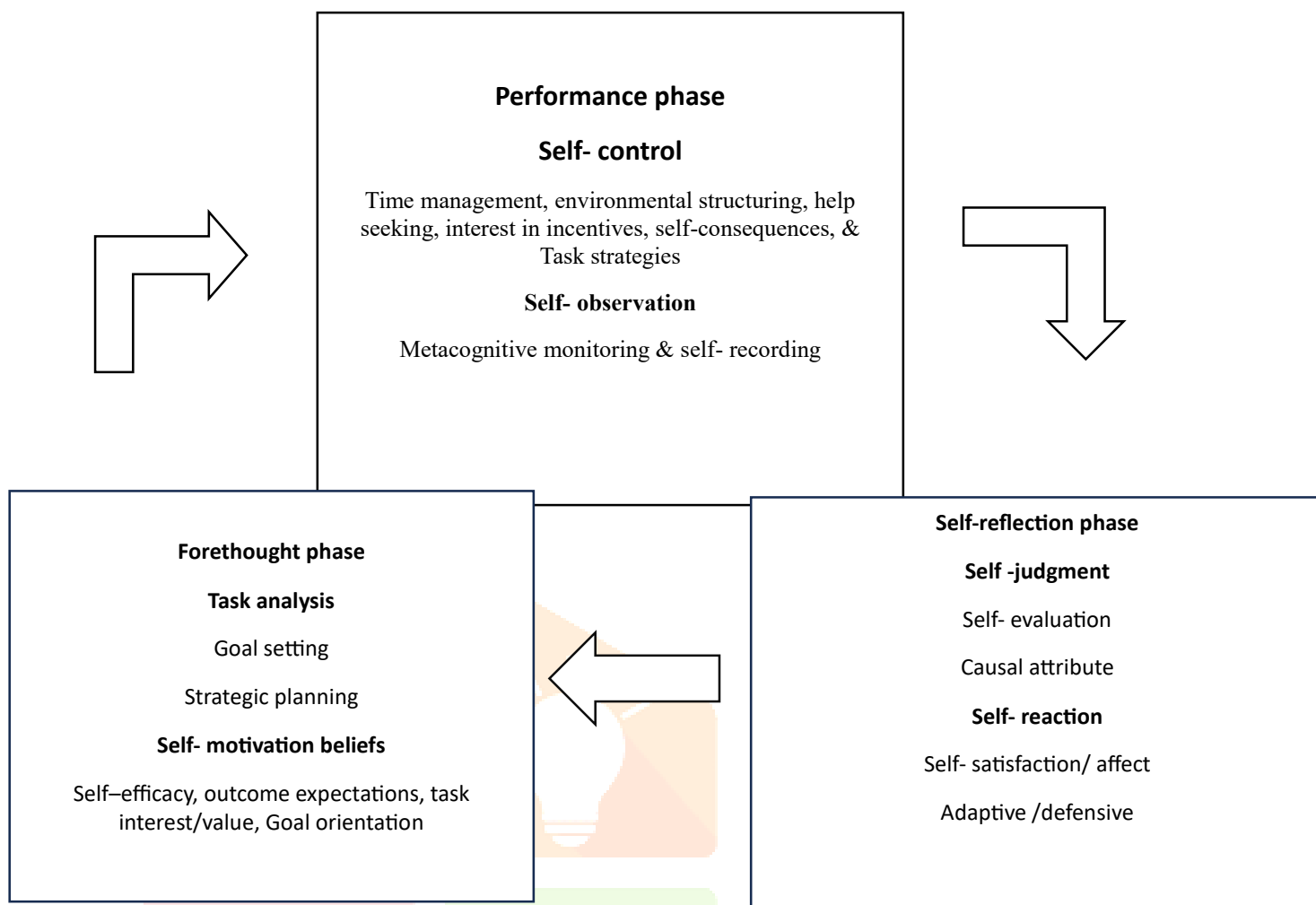


FIGURE 1 Cyclical phases model. Adapted from Zimmerman and Moylan (2009).

- Forethought phase:** This phase includes a two-phase process, task analysis, and self- motivation beliefs. In the first phase, the learner's goal-setting strategies and plans for academic success are developed by themselves. They set a proximal goal to acquire knowledge and a new skill. They know what is important and necessary to achieve an academic goal, such as time management and a considerable topic.
Self-motivation beliefs refer to self-efficacy and self-confidence in themselves, such as self- efficacy beliefs about having the personal capability to learn, and outcome expectations about personal consequences of learning (Bandura, 1997).
- Performance phase:** This phase includes two major classes: self-control and self-observation. Self-control refers to learners who follow specific methods and strategies in the forethought phase. Students implement their plan, actively monitor their progress, and apply self- control strategies to maintain focus and motivation throughout the task. This phase emphasizes cognitive engagement and regulation during task execution
Self-observation refers to self -monitoring and self- recording personal events or self-experimentation to find out the cause of these events.
- Self-reflection phase:** there are two major classes of self-judgment and self- evaluation. Self-judgment refers to the comparison of self- observed performances against some standard. Such as one's prior performance, another person's performance. or an absolute standard of performance.

8. Pintrich's Model

Pintrich's model of self-regulated learning SLR outlines four phases: forethought, planning, monitoring, control, and reflection, each with cognitive, motivational, affective, behavioral, and contextual elements.

- a) **Forethought, planning, and activation**
- b) **Cognitive phase:** includes goal setting, understanding the task, and planning strategies.
- c) **Motivational /Affection:** Evaluating the task's importance, setting personal goals, and developing self- efficacy.
- d) **Behavioral:** Engaging in the task, allocating time, and organizing resources.
- e) **Contextual:** Considering the environmental resources and available support.

Pintrich's framework of SRL

Pintrich's vital contribution to Self-Regulated Learning (SRL) theories is that he points out the common attributes shared by all existing SRL models:

Self-regulated learners actively engage in setting learning goals, reviewing prior knowledge, preparing cognitive strategies, and creating an environment for their learning process.

They monitor, control, and regulate both internal and external factors affecting their learning

All SRL models include criteria for learners to reflect on their progress and adjust their learning accordingly.

Self-regulated activities serve as the mechanisms through which learners achieve their learning goals.(Pintrich, 2000).

Pintrich illustrates these common attributes in his SRL framework, the framework of phases and areas of SRL (Pintrich, 2000). The framework comprises four phases of SRL, which are forethought, planning and activation, motivation, control, reaction, reflection, and regulation, with activities in each phase across the areas of learners' cognition, motivation, behavior, and context. Learning goals and motivation run throughout the framework, linking the self-regulatory activities (Pintrich, 2000). These two key factors are the focus of Pintrich's explanation of the framework.

Areas for Regulation					
S.N.	Phases	Cognition	Motivation/affect	Behavior	Context
1	Forethought, planning and activation	Target goal setting (i)Prior content knowledge activation (ii)Metacognitive knowledge activation	Goal orientation adoption Efficacy judgements Ease of learning judgments (EOLs),perception of task difficulty Task value activation Interest activation	Time and effort planning Planning for self-observation of behavior	Perception of task Perception of context
2.	Monitoring	Metacognitive awareness and monitoring of cognition (FOKs, JOLs)	Awareness and monitoring of motivation and effect	Awareness and monitoring of effort, time use for help	Monitoring changing task and context conditions
3	Control	Selection and adaptation of cognitive strategies for learning, thinking	Selection and adaptation of strategies for managing motivation and effect	Increase/decrease effort Persist, give up Help -seeking behavior	Change or renegotiation task Change or leave context
4.	Reaction and reflection	Cognitive judgment Attribution	Affection reaction Attribution	Choice behavior	Evaluation of task Evaluation of context

FIGURE 2. The role of goal orientation in self-regulated learning. Adapted from Paul R. Pintrich (2002).

The statement refers to a model that categorizes regulatory influences into four distinct domains:

Cognition: This area involves mental processes such as attention, memory, decision-making, and problem-solving that regulate behavior and responses.

Motivation: This domain concerns the internal drives, desires, and incentives that influence goal-directed behavior and persistence.

Behavior: This includes observable actions or reactions of an individual, shaped by both internal and external factors.

Context: This encompasses the environmental, social, and situational factors that affect regulation across cognition, motivation, and behavior.

Together, these areas provide a comprehensive framework to understand how regulation operates across multiple levels, integrating internal mental states with external influences to shape outcomes.

9. Winne's Model

Winne's model of self-regulated learning (SRL) emphasizes metacognition—the learner's awareness and control over their own cognitive processes. It conceptualizes SRL as a cyclical process involving continuous reflection and adjustment of learning strategies to improve outcomes.

The model identifies four key phases:

I. Planning

Setting goals and selecting appropriate strategies before engaging in a learning task.

Activating prior knowledge and organizing resources.

II. Monitoring

Tracking one's own comprehension and progress during the learning activity.

Recognizing when strategies are effective or need modification.

III. Control

Implementing adjustments to strategies based on monitoring feedback.

Managing time, effort, and attention to optimize learning.

IV. Evaluation

Reflecting on the outcomes after task completion.

Assessing the effectiveness of strategies and planning future improvements.

Key components of self-regulated learning according to Winne include:

Cognitive strategies: Techniques used to process and understand information, such as summarizing, elaborating, or organizing content.

Metacognitive strategies: Skills for planning, monitoring, and evaluating one's own learning processes. These strategies enable learners to regulate their cognitive efforts effectively.

This cyclical and recursive nature of Winne's model supports learners in becoming adaptive and strategic, continuously refining their approaches to learning tasks.

10. Significance of self-regulated learning in NEP 2020

Self-regulated learning (SRL) plays a crucial role in the context of NEP 2020, aligning with the policy's emphasis on learner autonomy, lifelong learning, and holistic development. NEP 2020 advocates a shift from rote memorization to competency-based education, encouraging students to take active responsibility for their learning. SRL fosters this by enabling learners to plan, monitor, and evaluate their learning strategies, thereby enhancing motivation, critical thinking, and problem-solving skills.

In NEP 2020, the focus on flexibility in curriculum design and multidisciplinary methods requires learners to adapt and self-manage their educational journeys. SRL supports this by cultivating skills such as goal-setting, time management, and self-assessment, which are essential for navigating diverse learning pathways and interdisciplinary content.

Moreover, the policy's promotion of digital literacy and the use of technology in education further underscores the need for SRL, as learners must independently engage effectively with digital resources and online learning environments.

Integrating SRL into pedagogy under NEP 2020 ensures that education is learner-centric, empowering students to become lifelong learners capable of self-directed growth, which is critical for personal, academic, and professional success in a rapidly evolving world.

11. Challenges in implementing SRL

a) Lack of Awareness:

Many students lack knowledge about SRL strategies or how to use them to improve academic performance

b) Need for Guidance

Many students do not receive proper guidance and instruction about SRL. Learning may be different to develop SRL habits.

c) Untrained and unskilled teachers

Many teachers are untrained and cannot provide proper guidance and knowledge to students about self-regulated learning. Students are not independent and do not decide on academic approaches. They are fully dependent on teachers and administration. It is a huge challenge for SRL.

d) School environment

It is a very important factor in the learning environment. Students' learning revolves around the school environment. Supportive environment can encourage students to plan, monitor, control, and evaluate their learning goals.

e) Digital Distractions

Many schools in India lack electricity, computers, Wi-Fi, and internet; because of this, students are not aware of self-regulated learning. They do not apply the self-regulated learning model in their own learning. It is the biggest challenge of SRL.

12. Conclusion

Self-regulated learning is crucial for Academic achievement and lifelong learning. After studying the theoretical paper by Zimmerman, Pintrich, and Winne, valuable insights into how learners can plan, monitor, and assess their learning. Zimmerman's model emphasizes the *cyclical process of forethought, performance, and self-reflection*. Interaction between students' thoughts, behaviour, and learning outcomes. Pintrich's model describes *regulation of cognitive motivation, behaviour, and context*. Third, Winne's model explains key factors: planning, monitoring, control, and evaluation. All models help students become independent decision-makers and manage their academic journey. In the present education system, SRL plays a crucial role. Autonomy and self-regulation are key components of NEP 2020. In this paper, the researcher discusses the importance of SRL and describes models of self-regulated learning.

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