Self Regulated Online Learning Strategy: An Analysis

Dr. Poonam jaiswal Assistant Professor-Department Of Education, Arya Mahila P.G.College, Varanasi (U.P.) India

Abstract – With the starting of digital era, use of high technique devices, expanding of internet technology, online learning become a part of learning process. Online learning either formal or informal, expanding very fast in entire world. Researches show that enrolment ratio is high in online courses than traditional regular courses in higher Education in India. In online courses students are responsible for their learning while teachers are in role of only facilitator. In this context, learners' Self regulated learning ability plays an important role. Without self regulated learning ability any learner cannot be success in his/her learning. Further it is more essential in this digital era. Self regulation for learning is a set of particular skills which can be developed among students through proper guidance, training and practice. To develop these skills among them it is important to know which type of self regulated online learning skills set is required. This study analyses the set of Self Regulated Learning Strategy (SRLS) proposed in various SRL Model. It also analyses the SRLS and related abilities applied in either face to face or online learning environment for optimum learning by higher education students

1. Introduction – With the starting of digital age, a new chapter of development of human civilization has begun. In this era emphasis is more on use of devices, internet technology, online interaction and online learning in the field of education. Online learning encompasses the use of all type of interaction and communication between teacher and student within a virtual environment (Ku & Chang, 2011). It has many advantages than face to face learning. It is more flexible in terms of time and place in comparison of traditional learning. It provides easy access to education to far students also. Thus the online learning has been increasing day by day. In other hand COVID19 pandemic has pushed education system in to online mode; consequently we all are tending to learn online very fast. We forcedly learnt to use internet technology for online classes and to complete other teaching – learning activities such as choosing learning materials, satisfying quarries, giving and taking feedback, assessment of teaching and learning and every aspect of education even use of laboratory too in all over the world. COVID19 make us friendlier to use of online technology for learning. Moreover, India has massive number of learner from five year old kid to eighty year old learner who belonging from different culture, races, locations, castes, creeds, and demographics. For this various range of learner without boundaries online courses are more suitable to access of education. These factors affected popularity of online learning positively. The enrolment ratio in online courses is more than traditional face to face courses in India (AISHE, 2021) Trends of this enrolment will be followed in future also. To keeping in view to expending access to education for all National Educational Policy (2020) aims to increase the Gross Enrollment Ratio (GER) in higher education to 50% by 2035, up from around 26% in 2019. To achieving the goal of accessibility NEP2020 greatly strengthen online learning by allowing Higher Education institutions to run full flagged online courses by increasing e-learning which will provide flexibility in terms of location and time for student and by emphasis on use of technology to make education system flexible.

Online learning is a kind of complex human activity to be done by students rather than to be done for students (Low & Jin, 2012). In other words, students are totally responsible for their learning. Thus it is totally autonomous process. In this process a student sets the goal, chooses the course and selects the time, place and learning strategy, identifies the feedback and motivational factors and decided the assessment tools also. It is stated that the success of online learning depends on learner's ability of self regulation. Self regulation is determinant of success of online courses (Kulusakli, 2022, Cho and Jonassen 2009) Self regulation is an individual ability which comprises many domains. It is difficult to identify the set of ability or set of skills which will helpful in successful online learning. Present study aims to explore various self regulated online learning abilities.

2. Objectives of the study –
1.   Articulate the theoretical foundations of SRL relevant to online learning

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2.   To identify the self regulation ability for learning in face to face learning environment.

3.   To identify the self regulating abilities for online learning.

Significance of the study – Online learning is increasing very fast in all over the world. Enrollment ratio in online courses is more than face to face traditional courses in India (AISHE, 2021). Success of online academic achievement of students depends on their ability of goal setting, task analysis time management, planning, self motivation and self evaluation. The set of these abilities give student a right direction towards successful learning. But every student has not all these abilities, if they have some abilities, but not sufficient for online self regulated learning which affect their online learning negatively. In other words online learning needs highly self regulated learning skill. This is a set of ability to learn skillfully and certainly it can be train also by competent teachers. In this context it is significant to know that which type of self regulated online learning strategy used so that a proper direction would be find to train them in self regulated online learning skill.

3. Method –Present study is based on 30 research paper published in reputed research journals extracted from JSTOR, ResearchGate, Taylor & Francis open resource database. To extract a set of strategy for self regulation various Self Regulated Learning Models are being analyzed through content analysis method. Further related Literatures are analyzed to identify the self regulated learning strategies and self regulating abilities for online learning.

3.1 Literature Search Criteria-

1.   Database sources: JSTOR, RESEARCHGATE, Taylor & Francis open resource database.

2.   Keywords: "self-regulated learning concept", "online learning", "and Self Regulated Learning Strategy"," student persistence".

3.   Inclusion criteria: Published between 2000-2020, with >100 citations.

4.   Exclusion: Non-English papers, off-topic studies.

3.2 Inclusion Criteria:

1.   Peer-reviewed journal articles.

2.   Focus on higher education students (undergraduate and postgraduate).

3.   Context explicitly involving online or blended learning environments.

4.   Empirical studies (quantitative, qualitative, mixed-methods) or comprehensive literature reviews/meta-analyses.

5.   Papers that detailed specific SRL strategies, their prevalence, impact, or factors influencing their use.

Results –

4.1 Theoretical Framework -

Analysis of Self Regulated Learning Models – In the last few decades numerous theories and models have tried to identify the process intervening in the self regulated learning and also establish the relation between self regulated learning and academic achievement. Self regulation has been defined by Zimmerman as learner's beliefs about their capability to engage in appropriate actions, thoughts, feelings and behaviors in order to pursue valuable academic goals, while self monitoring and self reflection on their progress toward goal completion. Most of the models describe about process of self regulated learning in which they suggest various domains of self regulated learning. These domains present different abilities related to self regulation particular in education. A brief of these models are presented here –

table-1: Summary of Self Regulated Learning models –

S.N.	SRL Model	Year	Model Authors
1.	Feedback based model of Self regulated learning	1995	Butler and Winne
2.	Structural Model of Self Regulated Learning	1996	Boekaerts
3.	Cyclical Phases of Self Regulation Model	2000	Prof. Zimmerman
4.	Self Regulated Learning Model	1999	Pintrich
5.	Meta cognitive and Affective Model of Self Regulated Learning	2011	Efklides

Most popular model of self regulated learning is Zimmerman's (2000) "Cyclical Phases of Self Regulation Model" that consist of three distinct phases as-

1. Forethought –

Task analysis - Goal setting, Strategic planning

Self motivational beliefs – Self efficacy, Outcome expectations, Intrinsicvalues, Goal orientation

2. Performance –

Self control- Self instruction, Imagery, Attention focusing, Task strategy

Self observation- Self Recording, Self experimentation

3. Self- reflection –

Self judgment- Self evaluation, Causal attribution

Self reaction- Self satisfaction, Adaptive defensive

Zimmerman mainly presented cyclical process of self regulation in which at first stage a learner draws forethought by aligning Goal setting, strategic planning, self motivational beliefs such as self efficacy, outcome expectations, intrinsic values and goal orientation. At second stage which is performance stage a learner performs with self control and self observation including self instruction, imagery, attention focusing and task strategy, self recording and self experimentation. At third stage a learner does self evaluation.

Boekaerts (1996) has proposed a "Structural Model of Self Regulated Learning" which has six domains which are as follows - (1) Domain specific (2) Cognitive strategy (3) Cognitive self regulatory strategy (4) Motivational beliefs and theory of mind (5) Motivational strategy (6) Motivational self regulatory strategy.

Butler and Winne (1995) have given four main domains in his model i.e." (1) Task definition (2) Goal setting (3) enacting study tactics (4) Adopting meta-cognition

In Efklides's (2011) "Meta-cognitive and Affective Model of Self Regulated Learning" comprises seven main domains as- (1) Cognitive (2) Motivation (3) Self concept (4) Affect (5) Volition (6) Meta-cognition in the form of meta-cognitive knowledge (6) Meta-cognition in the form of meta-cognitive skill

Similarly, according to Pintrich (1999) "Self regulated learning Model" there are five domains for self regulated learning- (1) Forethought – Planning and activation (2) Monitoring (3) Control (4) Evaluation.

All models describe self regulated learning as a certain type of behavioral pattern in which learner self regulate himself/herself using step by step strategy. Competence of using these strategies decides the success of a learner either in online or face to face traditional learning. On the basis of these models a set of Strategy can be outlined.

1. Cognition
2. Goal setting
3. Environment structuring
4. Task analysis/ Task strategy
5. Time management
6. Help seeking /Seeking support system
7. Self evaluation
8. Meta Cognition

These strategies are identified on the basis of careful review of various Models regarding self regulated learning. In the present study, self regulated online learning strategy will analyze in the context of above identified abilities.

4.2. Analysis of Studies related to Self Regulated Learning – According to researches done in the field of cognitive, meta-cognitive and self regulation, there is positive relation between academic achievement and self regulation. Academic achievement both in online and traditional face to face means achieving a particular subject knowledge, understanding and application skill express in terms of numerical or grade with degree (Rechardson,et.al.,2012). Klingsieck et al. (2012) find in their study that Self regulation ability plays an important role in online learning. Further they find that motivation has a significant place in self regulated learning.

Researches also emphasized the positive role of motivation in self regulated learning. Though, Hodges and Kim (2011) find in his study that using meta-cognitive strategy was significantly but weekly associated with academic achievement. Self regulation is depending on motivation and level of motivation decides whether student will successful in his/her self regulated learning or not (Ahmed, Wondemu 2017).

Self regulation is not an enduring ability of mental intelligence not it is personal characteristics that is genetically based or formed early in the life (Pinrtich, 1995). Zimmerman(1998) also advocates that student learn self regulation through experience and self reflection, because self regulation is not a personality trait. Student can control their behavior and affect to improve their academic learning and performance (Pintrich, 1995). According to Kizilcec et al., (2017) students who show a lack in self regulating attributes also show low academic performance. However with adequate training in these dimensions all students can improve their degree of control over learning and performance and many learning disabilities in terms of low performance can be overcome.

The learner himself is responsible for his/ her learning. In order to determine the role of learner in self regulated learning, it is important to have an overview of characteristics, features and general assumptions shared by researchers on the basis of their researches. Isman et al. (2004) have determined the Role of student in online education based on Constructivist Approach;

1. Students use appropriate technology to interact collaboratively with each other and teacher, and use feedback and consultation to develop and refine knowledge, skills, and attitudes.
2. Students are self-responsible for their own learning. They should decide what they want to learn, establish their goal, research and develop their subject.
3. Students research current data to answer questions and solve problems
4. Students learn to solve problems by assessment, data collection, and developing and implementing strategies using relevant information.

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5.   Students identify communication barriers, their causes, and solutions.

6.   Students promote life-long learning and know how to access and use information when instruction is finished.

Also Isman et al. (2004) find in his study that the role of students in distance education system is (1) assume responsibility for his/her own learning (2) Be disciplined and on task (3) Evaluate and judge your own performance (4) combat prejudice and communicational barriers.

Wolter et al. (2003) stated on the basis of his researches that a learner should be active, constructive and having control over their environment. Similarly Pintrich (2000) admires that self regulated learner should be active, constructive, meaning maker, and have potential for control. Further he describes that the learner can monitor and control his/her cognition, behavior and motivation in an academic learning. Though, all researchers accept that certain biological, developmental. Contextual and individual differences and constrains can interfere with individual efforts at self regulation. On the basis of above analysis, an outline of abilities for self regulated learning can be drawn. According to this analysis several abilities are required for self regulation to achieve success in learning. Summary of general stages given by models and essential abilities for completing stages of SRL are given in following table.

Table-2: Stages and required abilities for self regulated learning-

SN	Stages of SRL	Required Abilities
1.	Cognition	Sharp eyes, disciplined, decision maker, enthusiastic, regional thinker, critical thinker, having potential for control over their environment, meaning maker, active, constructive, having management skill, concentrate, Laborious, Planner, having communication skill, social. Positive, having scientific view, Creative, problem solver.
2.	Meta Cognition	
3.	Goal Setting	
4.	Planning	
5.	Task Analysis	
6.	Performance	
7.	Controlling/structuring Environment	
8.	Seeking support system	
9.	Self Evaluation	

4.3 Need of self regulation in online learning – Most popular model of self regulated learning is Pintrich's (2000) model. According to his "Self regulated learning Model" there are five domains for self regulated learning strategy- (1) Forethought – Planning and activation (2) Monitoring (3) Control (4) Evaluation. Moreover several studies suggested various strategies for self regulation in online learning settings. In online learning all these strategies are carried out by students themselves. While in face to face learning most of the learning strategies are set by instructor. In this type of learning an instructor decides the objectives of the study, set the goal and plan to achieve decided goal/ objectives. Further to execute the plane, instructor creates the situation, analyzes the task, and performs ones role and control the environment as well as directions of the learning. Even instructor observes students' learning progress and provides the support wherever they need. Moreover he/she motivates students towards learning and assesses their learning efforts and tries to provide remedial also. But in online learning, burden of all these efforts are on student's shoulder. Cohen (2017) reported that students are only responsible for their learning in online setup which takes them to dropout. The learners are working on their own; no one may know or care if they drop out, and the learner is alone in the pursuit of his/her learning endeavors. (Marry Burns, 2020) attrition rates in online courses hover around 40-60%. In Massively Open Online Courses (MOOCs), which are typically self-paced, attrition rates can (and often do) exceed 90%. But why in fact do many online learners persist even when confronted with internal and external challenges that may arise within a particular course or context? A major reason is "self-regulation." Obviously, an online course or program cannot change the innate characteristics of an online learner. But for successful online learning instructors can help learners to develop their own "self-regulated learning strategies" (Barnard-Brak et al., 2010). Researchers have suggested that SRLS are of greater importance in online learning environments due to their more autonomous nature (Dabbagh & Kitsantas, 2004). Self-regulation is a construct that become an important component of successful online teaching and learning (Barnard, Lan, To, Paton, & Lai, 2009). There is an increasing need for online faculty to not only be aware of the self-regulatory challenges that students face, but also to foster appropriate strategies as they have been shown to correlate with successful academic outcomes. Given the high attrition rates in online courses (Levy, 2007), there is a need for institutions to be more purposeful in providing support for students enrolled in these courses. Empowering students with the tools needed to be successful and active learners, rather than passive sponges, will lead to a more fulfilling and productive educational experience for all.

4.4. Self regulated learning strategy used by higher education student in online learning –

A thematic Analysis – Self Regulation Strategy Category: Research consistently demonstrates that successful online learners are those who effectively deploy a range of SRL strategies across the learning cycle. Based on the synthesis of numerous studies, these strategies can be broadly categorized according to the phases of SRL.

SN	Strategy Category	Implementatin	Key Findings
1.	Time Management and Environment Structuring	High emphasized (Mahmud and German) and (in (Genieva et al.)	In the included studies, these strategies are consistently identified core.
2.	Metacognitive Strategies(Planning, Monitoring, Evaluation)	High emphasis in reviews and surveys(Egger et al.), (Barnard Brak et al.), (Puzziferro) and (Artino and Stephens)	Strong association with higher academic performance and satisfaction
3.	Cognitive strategies (Rehearsal, Elaboration, Organization)	Frequently reported (Egger et al.) (Puzziferro) and (Artino and Stephens)	Often co- occur with metacognitive strategies
4.	Motivational Strategy	Affectively used (Mahmud and German) and (Artino and Stephens)	Motivational strategy linked with performance
5.	Help seeking and Collaboration	Highly used (Mahmud and German)	Help seeking is a challenge for students
6.	Technical Strategies	Not widely reported (Mahmud and German)	Reported as a challenge

5. Conclusion – The rapid global shift towards online learning platforms in higher education has significantly amplified the need for students to possess robust self-regulated learning (SRL) strategies. The above analysis shows that the SRL has a significant impact on student learning. By using SRL related skills, students can improve their performance. Various models of SRL presented a broad landscape of SRL which include strategies as time management, cognition, metacognition motivation, help seeking and technology use. These strategies play an important role in learning. Although there is a difference between characteristics and nature of face to face learning and online learning, yet the analysis of various studies shows that students are achieving success by using the same set of SRL strategies in both face to face and online learning.

5.1. Limitations of the study –
1. The evidence base is heterogeneous with variation in study design, sample size and reporting.
2. Many studies depend on self –report and lack standardized measurement and tools.
3. Not all studies report frequencies or direct performance outcomes.
4. The generalizability of findings may constrained by disciplinary and contextual differences.

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