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# Effect of Intervention on Self- Regulated Learning at Secondary Level

## Abstract

*Learning strategies are used by learners to help them to complete learning tasks and achieve goal successfully. Self-regulation learning strategies promote the cognitive process which builds the structured knowledge and creative thinking. Self-regulated learners have ability to use metacognitive strategies or differently, to control cognition. Self-regulated learners have ability to use both metacognitive and cognitive learning strategies. The survey method was used to ascertain self-regulated learning of secondary school students. It was found that a significant difference exists between pre-test and post-test in self-regulated learning practices. there exists a significant difference between pre-test and post-test in component wise self-regulated learning practices.*

***Keyword:*** *Self-Regulated Learning Strategies, Structural Knowledge, Creative Thinking*

## Introduction

Secondary level of education involves 10-15 age groups of the learner, which is the stage of early adolescence of child development. In this period, many changes occurs in the child as physical, intellectual, social behaviour. They are more able to think like adults. They move from concrete to abstract thinking, involves in social aspect of learning, want to spend most of their time with friends, become emotionally strong. According to Piaget (1964), abstract thought, meta-cognition, problem solving, deductive reasoning thought emerge during this stage.

Learning strategies are used by learners to help them to complete learning tasks and achieve goal successfully. Different professional define learning strategies in that own way. Brown, Bransford, Ferrara, and Campione (1983) define learning strategies are systematic application of deliberate plans, routines, or activities to enhance learning. According to Derry and Murphy (1986), it is a collection of mental tactics employed by an individual in a particular learning situation to facilitate the acquisition of knowledge or skill. Learners use different learning strategies, so they can lean easy. Cognitive learning strategies are associated with the actual processing of information to transform it into knowledge which is coming from the environment. Meta-cognitive strategies are strategies that enable the learner to take charge of his/her learning in a highly meaningful. Social/ affective strategies refers to strategies that learner use to learn by interaction with social group.

Self-regulation learning strategies promote the cognitive process which builds the structured knowledge and creative thinking. Self-regulated learners have ability to use metacognitive strategies or differently, to control cognition. Self-regulated learners have ability to use both metacognitive and cognitive learning strategies (Schoenfeld, 1992). Self-regulated learning strategies were mostly drawn from social learning theory of Albert Bandura. Self-regulated learners are meta-cognitively, motivationally and behaviorally active participants in their own learning in the context of social cognitive perspective (Zimmerman, 1986). The self-regulated learner has a combination of skill and self-control that makes learning easier, so they are more motivated to learn. According to Anita Woolfolk (2015, p. 440), three factors influences self-regulated learning are knowledge, motivation, and self-discipline or violation. Self-regulated learners need knowledge about themselves, the subject, the task, strategies for learning and context in which they apply learning. Violation is protecting opportunities to reach the goal. Self-regulated learners know that how to protect themselves from distraction.



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## Need of the study

NCF-2005 emphasizes that learners are the creator of knowledge. Self-regulated learners are actively involved in maximizing his or her opportunity and ability to learn. Self-regulated learning strategies is essential for a learner to maximizing their learning. Self-regulation learning strategies promote the cognitive and meta-cognitive process which builds the structured knowledge and creative thinking. Many researchers have conducted study on it. Some of the studied are discussed in the following paragraphs.

Zimmerman and Pons (1986) found that use of self-regulated learning strategies in non-classroom as well as classroom contexts is the substantial correlation with academic achievement. Zumbrunn et al. (2011) reveal that self-regulated learning is recognized an important predictor of student academic motivation and achievement. Dresel, M. and Haugwitz, M. (2008) found that an enhancement of metacognitive control strategies was evident only in the self-regulation condition. Santhanam, R. et al (2008) revealed that participants who were induced to follow self-regulated learning strategies scored significantly higher on learning outcomes than those who were not followed to do so. Sungur S. and Tekkaya, C. (2006) revealed that problem-based learning (PBL) students had higher levels of intrinsic goal orientation, task value, use of elaboration learning strategies, critical thinking, metacognitive self-regulation, effort regulation, and peer learning compared with control-group students. Kitsantas, A. et al. (2004) studied on developing self-regulated learners: goal setting, self-evaluation, and organizational signals during acquisition of procedural skills. Raval, D. K. (2014) examined effectiveness of self-regulated learning of secondary school students. Janagam, D. et al (2011) examined efficiency of task based learning and traditional teaching on self-regulated education. Gandhi, H. and Varma, M. (2007) discussed how teachers can help make their students recognise their (students') own beliefs, introspect their own behaviour, recognise their own motivational and affective strategies, comprehend their own cognition and have knowledge about their own thought processes (i.e., metacognition) while solving problems in mathematics.

## Justification for the study

Secondary education is the educational phase succeeding primary education and preceding higher education. It's commonly provided to individuals aged 14 to 18, though this can vary by country and educational system. Its goal is to furnish students with a comprehensive education geared towards higher studies or employment, fostering their

intellectual, social, and emotional development, as well as nurturing critical thinking, creativity, and autonomy.

Studying self-regulated learning at the secondary level is crucial as it equips students with lifelong skills to manage their own learning process effectively. This fosters autonomy, responsibility, and adaptability, essential for academic success and personal growth. Moreover, it cultivates metacognitive awareness, enhancing students' ability to monitor, regulate, and reflect on their learning strategies, ultimately leading to improved academic performance and preparation for higher education and the workforce.

From the analysis of the above research studies, it is found that many studies were conducted on self-regulated learning. These studies were conducted in abroad but few studies were conducted in India. Therefore, investigator raised research question such as is there any impact of intervention on self-regulated learning practices of students?

## Statement of the Problem

The present study would be stated as "Effect of Intervention on Self-Regulated Learning at Level".

## Objective

- To find the intervention enhancing self-regulated learning practices of students at the secondary level or not.
- To find the component-wise effect of intervention on self-regulated learning practices of students at the secondary level or not.

## Hypotheses

- There is no significant impact of the intervention on self-regulated learning practices of students at secondary level.
- There is no significant impact of the intervention on component-wise self-regulated learning practices of students at secondary level.

## Methodology

Mixed method was used to collect the data for the study. Firstly, the survey method was used to study self-regulated learning of secondary school students. Purposive Sampling Technique was used to collect data from IXth class secondary school students of Chiraiya (rural) and Motihari (urban) Block of Purvi Champaran District in Bihar. Purposive sampling was taken because it ensures selection of participants with specific characteristics or relevant to the study. It is suitable for creating homogeneous samples. The sample consisted of 79 students from IX



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class. Out of 79 Secondary school students, 48 (60.8%) are from boys, 31 (39.2%) are from girls and Out of 79 Secondary school students, 47 (59.5%) are from urban, 32 (40.5%) are from rural.

The investigator drafted Self-Regulated Learning Scale having with 60 items, based on Zimmerman and Pons (1986) model having 10 aspects such as Self-evaluation, Organizing and transforming, Goal-setting and planning, Seeking information, Environmental structuring, Self-motivation, Rehearsing and memorizing, Seeking assistance (peer, teacher, adult), Use of strategies, Keeping records and monitoring (self-monitoring) was developed by investigator. The questionnaire is of five point scales such as SA-Strongly Agree, A-Agree, Neither (N), DA-Disagree, and SDA-Strongly Disagree. The high score indicated the high level of self-regulated learning skill. The SRLS was given to five experts for their comments and suggestions. The experts rated each item on ten components; whether it was clear; whether it was supportive of self-regulated learning; whether it was suitable for secondary school context; Whether it was reflective of its given self-regulated component. The expert opinions were incorporated to ensure content validity of the tool. After feedback from the experts, 8 items were removed from the original Scale and some items were reformulated.

Finally, SRLS having 52 items used to ascertain the level of self-regulated learning practices of students at secondary level. SRLS consists 52 items. Out of 52 items, 34 items are positive items and 18 items are negative items. The positive statements on the scale for their response of SA-Strongly Agree, A-Agree, N-Neither, DA- Disagree, and SDA-Strongly Disagree are scored as 5, 4, 3, 2, 1 and the scored as 1, 2, 3, 4, 5 for negative statement.

The investigator established the reliability of SRLS by test-retest method. In the present study, the investigator was done test re-test among same 20 secondary school students on two different occasions. The value of 'r' is the reliability co-efficient between two scores was found 0.78. Thus, this index suggests that scale is reliable to measure self-regulated learning of students at secondary level.

The investigator purposely selected 10 students out of 79 with the lowest self-regulated learning practices to determine whether the intervention improves these practices among secondary level students. Out of 10 students, 5 students were from rural school and 5 students were from urban school students. Out of 10 students, 6 students were boys and 4 students were girls. Fifteen lessons were developed by the researcher for intervention on the basis of 10 aspects such as Self-evaluation, Organizing

and transforming, Goal-setting and planning, Seeking information, Environmental structuring, Self-motivation, Rehearsing and memorizing, Seeking assistance (peer, teacher, adult), Use of strategies, Keeping records and monitoring (self-monitoring). The lesson consists four topics from IX class mathematics book (NCERT): the surface area of cuboid and cube, the surface area of the right circular cylinder, the surface area of right circular cone and surface area of the sphere. The lessons were structured specifically to teach in a self-regulated learning environment. Lesson-1 was dealt with incorporating reciprocal teaching and cooperative learning for the self-regulation process. Lesson-2 was dealt with learning center to encourage students to work independently in a non-threatening environment. Lesson-3 was dealt with to teach the strategies and skills that are necessary for independent work (peer collaboration and teacher support). Lesson-4 was provided opportunities to students for self-monitoring: feedback, goals, think-aloud, detect errors, observation measures. Lesson-5 was dealt with evaluation practices, self-reflection. One hour time was given to deliver each lesson. 10 minutes was given to introduce the self-regulated strategy followed by throughout the lesson. After completing intervention programme, again SRLS was given to 10 students to ascertain the effect of self-regulated learning practices. After the administering the tool, investigator collected the questionnaire from students.

## Data analysis and interpretation

### A. Effect of Intervention on Self-Regulated Learning Practices

The first objective was to find out the effect of the intervention enhancing self-regulated learning practices of students at the secondary level or not. The investigator gave intervention on self-regulated practices and after that collected data regarding self-regulated learning practices of secondary school students by using SRL scale. Table-1 gives effect of intervention on self-regulated learning practices.

**Table -1**

**Effect of Intervention on Self-Regulated Learning Practices**

| Type of tests | N | Mean | SD | df | t-value | Significance |
|---|---|---|---|---|---|---|
| Pre-test | 10 | 129.50 | 5.798 | 9 | 27.874 | .000 |
| Post-test | 10 | 217.50 | 8.383 | | | |

Table -1 infers that the mean and SD of self-regulated learning practices of students are 129.50 and 5.798 respectively in the pre-test. The mean and SD self-regulated learning practices of students are 217.50 and 8.383 respectively in post-test. The t-value is 27.874 and significant



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value is 0.000 which is lesser than 0.05 and thus, there exist a significant difference between pre-test and post-test in self-regulated learning practices at 0.05 level. Hence, null hypothesis is rejected and alternative hypothesis is accepted, there is significant impact of the intervention on self-regulated learning practices of students at secondary level.

### B. Component-Wise Effect of Intervention on Self-Regulated Learning Practices

The second objective was to find out the component-wise effect of the intervention enhancing self-regulated learning practices of students at the secondary level or not. The investigator gave intervention on self-regulated practices and after that collected data regarding self-regulated learning practices of secondary school students by using SRL scale. Table-2 gives component-wise effect of intervention on self-regulated learning practices.

**Table-2**

**Component-Wise Effect of Intervention on Self-Regulated Learning Practices**

| Component | Type of teats | N | Mean | SD | df | t-value | Sig. |
|---|---|---|---|---|---|---|---|
| Self-evaluation | Pre-test | 10 | 28.70 | 4.347 | 9 | 19.255 | 0.000 |
| | Post-test | 10 | 53.40 | 2.875 | | | |
| Organizing and transforming | Pre-test | 10 | 9.70 | 1.337 | 9 | 2.388 | 0.041 |
| | Post-test | 10 | 11.30 | 1.160 | | | |
| Goal-setting and planning | Pre-test | 10 | 10.20 | 1.619 | 9 | 3.473 | 0.007 |
| | Post-test | 10 | 12.30 | 1.434 | | | |
| Seeking information | Pre-test | 10 | 8.70 | 2.669 | 9 | 6.003 | 0.000 |
| | Post-test | 10 | 15.40 | 1.776 | | | |
| Environmental structuring | Pre-test | 10 | 11.00 | 2.449 | 9 | 5.071 | 0.001 |
| | Post-test | 10 | 15.00 | 1.944 | | | |
| Self-motivation | Pre-test | 10 | 29.30 | .483 | 9 | 37.088 | 0.000 |
| | Post-test | 10 | 60.60 | 2.633 | | | |
| Rehearsing and memorizing | Pre-test | 10 | 5.00 | 1.247 | 9 | 9.588 | 0.000 |
| | Post-test | 10 | 9.30 | .823 | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Seeking assistance (peer, teacher, adult) | Pre-test | 10 | 8.80 | 2.394 | 9 | 7.242 | 0.000 |
| | Post-test | 10 | 15.30 | 1.947 | | | |
| Use of strategies | Pre-test | 10 | 9.40 | 1.897 | 9 | 3.138 | 0.012 |
| | Post-test | 10 | 12.60 | 1.776 | | | |
| Keeping records and monitoring (self-monitoring) | Pre-test | 10 | 8.70 | 2.003 | 9 | 4.718 | 0.001 |
| | Post-test | 10 | 12.30 | .949 | | | |

Table-2 infers that in the component self-evaluation, the mean and SD of self-regulated learning practices of students are 28.70 and 4.347 respectively in the pre-test. The mean and SD self-regulated learning practices of students are 53.40 and 2.875 respectively in post-test. The t-value is 19.255 and significant value is 0.000 which is lesser than 0.05 and thus, there exist a significant difference between pre-test and post-test in self-regulated learning practices at 0.05 level. Hence, null hypothesis is rejected and alternative hypothesis is accepted, there is significant impact of the intervention on self-regulated learning practices of students at secondary level.

Table-2 also infers that in the component organizing and transforming, the mean and SD of self-regulated learning practices of students are 9.70 and 1.337 respectively in the pre-test. The mean and SD self-regulated learning practices of students are 11.30 and 1.160 respectively in post-test. The t-value is 2.388 and significant value is 0.041 which is lesser than 0.05 and thus, there exist a significant difference between pre-test and post-test in self-regulated learning practices at 0.05 level. Hence, null hypothesis is rejected and alternative hypothesis is accepted, there is significant impact of the intervention on self-regulated learning practices of students at secondary level.

Table-2 also infers that in the component goal-setting and planning, the mean and SD of self-regulated learning practices of students are 10.20 and 1.619 respectively in the pre-test. The mean and SD self-regulated learning practices of students are 12.30 and 1.494 respectively in post-test. The t-value is 3.473 and significant value is 0.007 which is lesser than 0.05 and thus, there exist a significant difference between pre-test and post-test in self-regulated



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learning practices at 0.05 level. Hence, null hypothesis is rejected and alternative hypothesis is accepted, there is significant impact of the intervention on self-regulated learning practices of students at secondary level.

Table-2 also infers that in the component seeking information, the mean, and SD of self-regulated learning practices of students are 8.70 and 2.339 respectively in the pre-test. The mean and SD self-regulated learning practices of students are 15.40 and 1.776 respectively in post-test. The t-value is 6.003 and significant value is 0.000 which is lesser than 0.05 and thus, there exist a significant difference between pre-test and post-test in self-regulated learning practices at 0.05 level. Hence, null hypothesis is rejected and alternative hypothesis is accepted, there is significant impact of the intervention on self-regulated learning practices of students at secondary level.

Table-2 also infers that in the component environmental structuring, the mean and SD of self-regulated learning practices of students are 11.00 and 2.449 respectively in the pre-test. The mean and SD self-regulated learning practices of students are 15.00 and 1.944 respectively in post-test. The t-value is 5.071 and significant value is 0.001 which is lesser than 0.05 and thus, there exist a significant difference between pre-test and post-test in self-regulated learning practices at 0.05 level. Hence, null hypothesis is rejected and alternative hypothesis is accepted, there is significant impact of the intervention on self-regulated learning practices of students at secondary level.

Table-2 also infers that in the component self-motivation, the mean and SD of self-regulated learning practices of students are 29.30 and .483 respectively in the pre-test. The mean and SD self-regulated learning practices of students are 60.60 and 2.633 respectively in post-test. The t-value is 37.088 and significant value is 0.000 which is lesser than 0.05 and thus, there exist a significant difference between pre-test and post-test in self-regulated learning practices at 0.05 level. Hence, null hypothesis is rejected and alternative hypothesis is accepted, there is significant impact of the intervention on self-regulated learning practices of students at secondary level.

Table-2 also infers that in the component rehearsing and memorizing, the mean and SD of self-regulated learning practices of students are 5.00 and 1.247 respectively in the pre-test. The mean and SD self-regulated learning practices of students are 9.30 and 0.823 respectively in post-test. The t-value is 9.588 and significant value is 0.000 which is lesser than 0.05 and thus, there exist a significant difference between pre-test and post-test in self-regulated learning practices at 0.05 level. Hence, null hypothesis is rejected and alternative hypothesis is accepted, there is significant impact of the intervention on self-regulated learning practices of students at secondary level.

Table-2 also infers that in the component seeking assistance, the mean and SD of self-regulated learning practices of students are 8.80 and 2.394 respectively in the pre-test. The mean and SD self-regulated learning practices of students are 15.30 and 1.947 respectively in post-test. The t-value is 7.242 and significant value is 0.000 which is lesser than 0.05 and thus, there exist a significant difference between pre-test and post-test in self-regulated learning practices at 0.05 level. Hence, null hypothesis is rejected and alternative hypothesis is accepted, there is significant impact of the intervention on self-regulated learning practices of students at secondary level.

Table-2 also infers that in the component use of strategies, the mean, and SD of self-regulated learning practices of students are 9.40 and 1.897 respectively in the pre-test. The mean and SD self-regulated learning practices of students are 12.60 and 1.776 respectively in post-test. The t-value is 3.138 and significant value is 0.012 which is lesser than 0.05 and thus, there exist a significant difference between pre-test and post-test in self-regulated learning practices at 0.05 level. Hence, null hypothesis is rejected and alternative hypothesis is accepted, there is significant impact of the intervention on self-regulated learning practices of students at secondary level.

Table-2 also infers that in the component keeping records and monitoring, the mean and SD of self-regulated learning practices of students are 8.70 and 2.003 respectively in the pre-test. The mean and SD self-regulated learning practices of students are 12.30 and 0.949 respectively in post-test. The t-value is 4.718 and





significant value is 0.001 which is lesser than 0.05 and thus, there exist a significant difference between pre-test and post-test in self-regulated learning practices at 0.05 level. Hence, null hypothesis is rejected and alternative hypothesis is accepted, there is significant impact of the intervention on self-regulated learning practices of students at secondary level.

## Major findings

- There was a significant difference between pre-test and post-test in self-regulated learning practices at 0.05
- There was a significant difference between pre-test and post-test in component wise self-regulated learning practices at 0.05 level.

## Limitations of the study

The study was limited to ten dimensions of self-regulation strategies as Self-evaluation, Organizing and transforming, Goal-setting and planning, Seeking information, Environmental structuring, Self-motivation, Rehearsing and memorizing, Seeking assistance (peer, teacher, adult), Use of strategies, Keeping records and monitoring (self-monitoring). The study was also limited to 10 students selected purposively studying in class IXth and Xth for this investigation.

## Educational implications

Self-regulated learning strategy helps students to develop cognitive processes, to analyze, and manage their own thinking, avoid intrinsic and extrinsic distractions in the quest of knowledge. Self-regulation learning strategies promote the cognitive process which builds the structured knowledge and creative thinking.

The present study found that the intervention programme enhances the self-regulated learning at the secondary level. So secondary school curriculum should incorporate principles of self-regulation in the pedagogy courses and perspective courses. The trainee teachers should be motivated to use the self-regulated learning during the internship in teaching.

The present study found that intervention programme has a significant effect in developing self-regulated learning practices. Intervention program consists of incorporating reciprocal teaching and cooperative learning for the self-regulation process, learning

center to encourage students to work independently in a non-threatening environment, teach the strategies and skills that are necessary for independent work (peer collaboration and teacher support), opportunities to students for self-monitoring: feedback, goals, think-aloud, detect errors, observation measures, evaluation practices, and self-reflection. So that training for in-service teachers should be given on the basis of this intervention programme.

The study has implications for Head Teacher/Principal of school. Freedom should be given by the headmaster/principal to teachers to incorporate self-regulated learning principle in their teaching because without the cooperation of headmaster/principal, teachers cannot be able to apply the principle of self-regulated learning in their daily teaching practices. The headmaster/principal should motivate to the teachers to incorporate self-regulated learning principle in their daily teaching practices.

School curriculum and textbook should be designed on the basis of self-regulated learning principle. Suitable activities, exercises and evaluation questions should be included in the Textbook and teachers need to be oriented for using it in the classroom

## Conclusion

The aim of this research was to study Effect of Intervention on Self-Regulated Learning at secondary Level. It can be concluded that students with higher self-regulated learning strategies have more achiever. Mastering new learning strategies might help improve results. Finding of this study was supported by Raval, D. K. (2014). Results of the study was also supported by Janagam, D. et al (2011). 9-10th grade students might be more self-rigorous in evaluating their performance, and thus it is important to ensure they do not get discouraged by it. The research shows that teacher's help is needed to ensure students' well-being, and consequently, ability to learn. Learning activities like discussions, group work and peer-review might help. More research is needed to clarify the differences between self-regulated learning skills in distinctive student groups (age, gender, higher and lower achieving students). This could help provide students with more individualised support.



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# 9

# Strategic Assessment of Government Funding in Samagra Shiksha Schemes: Analyzing Current Status, Mitigating Challenges, and Proposing Future-Ready Financial Frameworks for Educational Empowerment in India

## Abstract

*This research explores the intricate landscape of financial allocations and expenditures for Information and Communication Technology (ICT) Labs and Smart Classrooms within the framework of the Samagra Shiksha scheme across Indian states. Covering fiscal years 2018-2019 to 2021-2022, the study dissects state-wise trends, revealing nuanced patterns in budgetary decisions and expenditure outcomes. The analysis delineates the educational technology trajectory of each state, highlighting the consistency or fluctuations in allocations for ICT Labs and Smart Classrooms. It unravels disparities in expenditure patterns, emphasizing the significance of efficient resource utilization. Notably, the introduction of Smart Classrooms in 2020-2021 marks a pivotal transition, necessitating scrutiny of readiness, challenges, and successes in their implementation. Beyond statistical scrutiny, the research offers a holistic perspective by linking financial decisions to educational impacts. It investigates the correlation between budgetary choices and learning outcomes, student engagement, and technological accessibility. By doing so, the study bridges the gap between financial strategies and the tangible benefits reaped by the education sector. Furthermore, the research encapsulates a diverse array of state-wise scenarios, allowing*