Self-Regulated Learning in Science Classroom

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Abstract: *The human race is entering in the phase of expansion and innovation in various domains which are necessary factors to equip the skills for generating great structure in social, intellectual, cultural and political phenomenon. Indeed skill development with creative aspects highly depends on multi dimensional educational system. Education is the process to make the students to realize their self-image and inner potentials. Regularization in self habits brings higher achievement in diverse fields. This study aims to find whether using self-regulated learning strategies brings possible achievement in science subject. The objective of the study was to predict self-regulated learning significantly related to achievement in science. The sample consisted of 300 ninth standard students from different management using survey method. The major findings revealed that the strategies of self-regulated learning significantly related to achievement in science.*
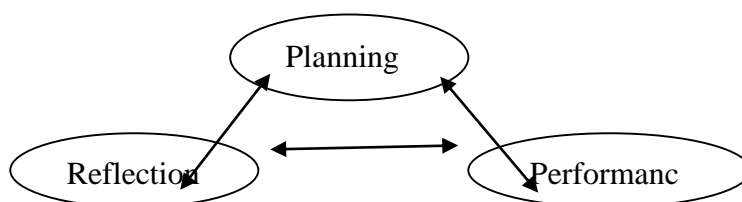
Key Words: *Self-regulated learning (SRL), Achievement in Science and Ninth standard students.*

1. INTRODUCTION:

Learning throughout life thus emerges as one of the key elements in the 21st century educational environment. Learning brings positive changes among the students. The right way of learning strengthens their confidence to enhance self-regulation skills. Freedom to learn is one of the motive forces which stimulate self-regulation in their own learning process. In Education self-regulated learning is closely related to the way in which learners regulate their emotions, cognitions, behaviors and environmental factors during the teaching and learning process. **Barry Zimmerman (1986)** is a pioneer researcher in the field of self-regulated learning stated that self-regulation gives direction in the learning process through which students can transform their mental skills into academic skills.

2. THEORY OF SELF-REGULATED LEARNING:

Self-regulated learning is a core conceptual framework to understand and analyze the learning process by using motivational and learning strategies. Self-regulated learning is a cyclical process **(Zimmerman and Kitsantas, 2002)** wherein the students cross the three stages namely Planning, Performance and Reflection by which students can mould their specific learning tasks.

In the first stage, the students establish their internal and external goals and standards and they are asked to demonstrate their commitment to their learning experience in the second stage. During the third stage, the students evaluate their learning experience which includes reflecting over feedback and gathering ideas and concepts mentally for use in future learning. Inside these stages, the instructors play a vital role in guiding and directing the students to perform well and additional information about the concepts also provided by them at each stage for the students. Hence it is called as a cyclical process.

3. REVIEWS RELATED TO SELF-REGULATED LEARNING AND ACHIEVEMENT IN SCIENCE:

Jayawardena et.al (2017) analyzed the case study of science teacher in fostering self-regulated learning in her classroom. The objective of the case study was to examine the role of the teacher and her teaching in shaping her students' learning in science and possibly in their SRL. The tools such as Classroom observations and a semi-structured interview were used to collect data. The findings showed that the overloaded science syllabus and limited resources were barriers for her to use teaching practices that foster Self-regulated learning. **Payel Banarjee and Kamlesh Kumar (2014)** attempted to find out the relation of SRL and academic achievement of male and female Science graduate students and the sample consisted of 300 for the survey method. The tools used were "Self-regulated learning scale" developed by researcher and academic achievement marks had taken from second year examinations. The results

revealed that SRL is moderately positive correlation with academic achievement. **Cleary and Platten (2013)** examined a case study to evaluate the correspondence between Self-Regulated Learning and Academic Achievement. Four high school students were taken as sample for mixed model case study and the adopted tools were traditional SRL assessment tools, Self-Regulation Empowerment Program (SREP) and biology test scores. The key findings found that the close correspondence between changes in students SRL, Biology exam performance and SREP attendance.

4. RESEARCH QUESTION:
The present study attempts to answer the following question:
- Does Self-regulated learning influence achievement in Science among ninth standard students?

4.1. OBJECTIVE: To predict Self-regulated learning significantly related to Achievement in Science among ninth standard students.

HYPOTHESIS: There is a linear relationship between Self-regulated learning and Achievement in Science among ninth standard students

5. METHODOLOGY:
5.1. METHOD AND DESIGN: In this study survey method has been adopted to predict the linear relationship between the chosen variables.

5.2. SAMPLE: The sample consisted of 300 students from Government Higher Secondary Schools in Chennai. Stratified sampling technique was used.

5.3. TOOLS APPLIED: Paul Pintrich's Motivated Strategies Learning Questionnaire (1991) has been used to measure Self-regulated learning with dimensions under two categories such as motivation and learning performance. Achievement in Science marks has been taken from their previous class.

5.4. STATISTICAL TECHNIQUES:
In the present study, the following statistical techniques were applied.
- Descriptive Statistics
- Regression Analysis

6. RESULTS AND DISCUSSION:

Table – 1 Descriptive Statistics

Variables	N	Mean	Std. Deviation
Self-Regulated Learning	300	438.21	62.029
Achievement in Science	300	77.05	14.894

From the above table, the mean score of Self-regulated learning is 438.21 when its standard deviation is 62.029. In addition, the mean score for Achievement in Science is 77.05 and the standard deviation is 14.894.

Table - 2 Regression for testing the Achievement in Science on Self-regulated learning
Model Summary

Model	R	R Square	Adjusted R Square	SE
1	0.152[a]	0.023	0.020	14.746

a. Predictors: (Constant), Self-regulated learning

Table – 2.1 ANOVA testing the significance of the Regression between Self-regulated learning and Achievement in Science

Model 1	Sum of Squares	df	Mean Square	F	Sig.
Regression	1534.804	1	1534.804	7.059	0.008
Residual	64796.543	298	217.438		
Total	66331.347	299			

a. Dependent Variable: Achievement in Science
b. Predictors: (Constant), Self-regulated learning

Table – 2.2 showing the significance of Co-Efficient in the Regression Equation for Self-regulated learning and Achievement in Science

Model 1	Unstandardized Co-efficients		Standardized Co-efficients	t	Sig.
	B	**Std. Error**	**Beta**		
(Constant)	61.041	6.084		10.033	0.000
Self-Regulated Learning	0. 037	0.014	0.152	2. 657	0.008

a.   Dependent Variable: Achievement in Science

The Regression value 'R' 0.152 and the F test (F= 7.059) is significant at 0.01 level. Self-regulated learning contributes independently to Achievement in Science and significantly predicts the same. The value of R square 0.020 suggest that 2 % of the variance can be attributed to Achievement in Science based on the variance in Self- regulated learning. The table of Beta co-efficient value 0.152 which indicates that Self-regulated learning is an important predictor of Achievement in Science. The following regression equation has been worked out to predict Achievement in Science in terms of Self-regulated learning.

$Y1 = 61.041 + 0.037X1$

Where Y1 Achievement in Science

X1 Self-regulated learning

Hence it is concluded that self-regulated learning seems to contribute well in Achievement in science from the above interpretation.

7. MAJOR FINDING:

- Achievement in Science is linearly related to Self-regulated learning of ninth standard students.

The present study revealed that there is a linear relationship between Self-Regulated Learning and Achievement in Science which agreed with **(Padmapriya, 2015)** who suggested that self-learning modules highly increase the students' achievement in biology and differed with the result of **(Kayode John Olasehinde, 2014 and Baris Cetin, 2015)** who found the insignificant relationship between self-regulation, academic achievement and achievement in science. Science is a subject which requires more skills to do hands on practices. Gamification, activity based learning, demonstration and laboratory experience considered as vital methodologies for learners from science stream to design their learning process with conscious efforts. It helps to maximize expertise, enjoyment, engagement and explore through capturing the interest of learners and inspiring them to continue learning as a lifelong learner.

8. RECOMMENDATIONS:

- The present study is restricted to urban students from Science stream. It can be extended to sub-urban and rural students also to make aware about self-regulated learning and how it influences their academic performance.
- The present study can be widened to other subjects and compared the scores with its academic domains in addition to experimental treatment.

9. CONCLUSION:

In this digital era, self-regulated learning is an important phase in academic learning to gain higher achievement. Experts and researchers in various field suggested that students who are expertise in using self-regulated learning strategies in the classroom more likely to be successful in their academic performance in diverse subjects. Having self-regulated learning skills provides direction to regulate emotional, behavioral, cognitive and social aspects from which students can develop commitment towards learning and can transform into academic performance easily. Positive self-reflection is an identification of emotional intelligence, attainment of goals and adjustability towards the environment. Hence organizing more seminars and conferences using the area of self-regulated learning strategy is significant which will create awareness among teachers, parents and peer groups about how to use these strategies and self-management skills to gain higher achievement.

REFERENCES:

1. Zimmerman B. J, (1986): Becoming a self-regulated learner: which are the key sub processes?. *Contemp. Educ. Psychol*., *11,* 307–313.
2. Zimmerman B.J., and Kitsantas A, (2002): Acquiring writing revision and self-regulatory skill through observation and emulation. *Journal of Educ. Psychol., 94,* 660–668.

3. Jayawardena K.R., Kraayenoord C.E., and Carroll A, (2016): Promoting self-regulated learning in Science: A Case study of a Sri Lankan secondary school Science teacher. *International Journal of Information and Education Technology, 7(3),* 195-198.
4. Banarjee P., and Kumar K, (2014): A study on self-regulated learning and academic achievement among the Science graduate students. *International Journal of Multidisciplinary Approach and Studies, 1(6),* 329 – 342.
5. Padmapriya P.V, (2015): Effectiveness of self-learning modules on achievement in Biology among secondary school students. *International Journal of Education and Psychological Research, 4(2),* 44-46.
6. K.J. Olasehinde, (2014). Self-regulation and Peer influence as determinants of Senior Secondary School Students Achievement in Science, Doctoral diss, University of Ibadan, Nigeria, Ph.D.
7. Cetin B, (2015): Academic motivation and self-regulated learning in predicting academic achievement in college. *Journal of International Education Research, 11(2),* 95-106.

WEB REFERENCES:
- http://dx.doi.org/10.1155/2013/272560

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        Dr. R. Muthulakshmi is working as a Guest Lecturer in Lady Willingdon Institute of Advanced Study in Education, Chennai. Her teaching areas are Physical Science, English literature studies and Research Methodology and Statistics. She has published 7 research papers in various national and international journals and presented more than 20 articles and papers in various conferences and seminars besides articles has written to book chapters also.