Self-Regulated Learning and Academic Performance of Secondary School Students

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Abstract

Student, family and school related factors contribute for the academic performance of students at secondary school level. Self-regulated learners get ready to face educational challenges and have potential to solve their problems on their own. They try their best to achieve mastery on learning goals by self-motivation, self-directedness and self-evaluation. A causal comparative research design was used to investigate the effect of self-regulated learning (SRL) on secondary school students' academic performance. Private and public sector secondary school students (N=1098) were targeted for collection of data through multistage probability sampling technique. ASLI (Academic Self-regulated Learning Inventory) was used to amass students' responses for using SRL strategies. Results showed that all phases of self-regulated learning process have considerable effect on academic achievement of secondary school students. Private school students were more invigorating in their self-regulated learning process and tend to have higher grades than public school students. Secondary school educators and policymakers may be more active in introducing SRL strategies to students so that they may adopt such practices and progress in learning.
Key words*:* self-regulated learning, secondary school graders, academic attainments, academic performance, self-motivation, self-directedness

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Introduction

Academic performance and progress of secondary school students always remain a matter of great concern for the school and family. Parents and teachers are essential source in developing suitable learning attitude among students. Learning becomes more powerful and effective when students directly involve themselves in learning process. Student, school and family related factors play a crucial role in enhancing learner's autonomy, creativity, and sense of responsibility and engage them in their academic process.

Self-regulated learning modes are self-directed procedures, thoughts and actions to achieve educational goals and objectives. Self-regulated students are self-directed in their learning activities, decision making, and are high in their academic success (Yan, 2020). These actions embrace goal setting, time management, self-monitoring, self-regulation in academic tasks and self-imposed contingencies in order to achieve personal academic goals. Self-regulated learners have clear objectives and purposes for their academic affairs and try their best to achieve maximum success (Xiao, Yao, & Wang, 2019).

SRL is a process that provides greater opportunities for students to get them involved in meta-cognitive process, make them intrinsically motivated and regulate their learning behaviors and attitudes. Self-regulated learners have ability to formulate learning goals for themselves, and thus they try hard to accomplish these goals under the guidance of their teachers, parents and more educated peers (Lim, Jalil, Ma'rof, & Saad, 2020).

Self-regulated students take interest in their educational affairs and use a number of strategies to solve their educational problems. It is important to cultivate self-regulated attitude during the age of adolescents because it is crucial age span when autonomy and self-determination is needed (Wang & Cai, 2017). Self-regulated students are stimulating and vigorous in their learning process, they set short and long term goals for their educational work, then monitor their performance and have ability to control and apply self-imposed contingencies. These learners use self-reflection for their learning progress and organize their educational behaviors (Daniel, Wang & Berthelsen, 2016).

The social cognitive model of SRL has three stages that are further divided in to sub stages (Zimmerman, 2000). Each stage leads students towards self regulated process. The forethought stage of this model consists on the sub-stages of task-analysis and self-motivational beliefs that is the ability of learners what they can do and tend to do. This stage prepares students for taking educational actions for their learning process. Second stage is performance phase and includes sub-stages of self-control (i.e.) self-instruction, imagery or mental picture forming, attention focusing and task strategies and self-monitoring that motivate students to keep their progress on track by staying on task and solving the problems they found in learning process (Moreno, 2010).

Third stage of this model is self-reflection, which provides opportunity to learner to check his own performance and progress in order to achieve stated goals (Zimmerman, 1998, 2000, 2002). At this stage learner evaluate his/her own performance and use imposed contingencies to regulate their academic affairs. SRL has cyclical nature and thus last stage of self-reflection leads towards first (Xu, Benson, Mudrey-Camino & Steiner, 2010).

Zimmerman (2000) Self-regulated learning model is based on social cognitive theory of Bandura (1986). It is reciprocal theory in which self (personal), behavioral and environmental factors are included. These factors are independent and interdependent in their nature. Self-regulated environment refers to adjust environmental situations and conditions according to individual's observations (El-Adl, & Alkharusi, 2020). Self-regulatory skills allow learner to learn from others' experiences and behaviors by observing them in social environment. At the first stage of SRL, guidance from others is very necessary that is decreased at further stages of SRL (Puustinen & Pulkkinen, 2013). As the model of SRL has social cognitive nature, so it is assumed that the students' efforts and learning through self-regulatory process is dependent and contextualized in order to gear up their performances (Pintrich, 2000).

SRL is a process in which adolescents are not only active in their cognitive and affective tasks but also in their actions and behaviors in order to regulate their educational activities (Schunk & Zimmerman, 2012). Self-regulated students are active in their metacognitive process, use self-motivations and self-directed actions to maximize success of their learning process (Zimmerman, 2002). In the repeated process of SRL students set goal for their educational tasks, monitor their performances, and modify their goals and strategies to accomplish educational tasks with success (Zimmerman, 2008).   According to socio cognitive theory self-regulated adolescents with clear directions, are organized in their thoughts, actions and behaviors to meet their learning goals (Zimmerman, 2002 & Schunk, 2001). SRL is considered as a mechanism to achieve mastery in leaning content in order to attain maximum success in academics.

SRL practices makes students conscientious for development of learning habits, skills and attitudes towards their learning and responsible for failure and success of their performance. They evaluate, judge and monitor their learning actions to maximize their success (Jarvela & Jarvenoja, 2011). Many studies frazzled on importance of self-efficacy belief (Cleary & Kitsantas, 2017) and use of SRL skills in order to ensure academic success (Cerezo, Fernandez, Amieiro, Valle, Rosario, & Núñez, 2019). Self regulated adolescents are well aware about educational strengths and weaknesses which they possess (Yan, 2020) they set aspirations and ambitions for their educational tasks and use multiple ways to achieve (Xiao, Yao, & Wang, 2019). They look out their performances, stayed on task confidently; have high self-efficacy abilities in order to

achieve maximum learning success (Martinez-Pons, 2002; Metallidou, 2013; Sadi & Uyar, 2013; Schunk, 2012; Zimmerman, 2002).

Wang, King, & Rao (2019) found that mastery of learning goals is highly based on cognitive strategies and self-regulated strategies. Students with greater self-efficacy and SRL proficiency are able to solve difficult educational tasks, and try to achieve mastery in learning goals than those students who have less self-efficacy and self-regulation in their academic affairs (Agustiani, Cahyad, & Musa, 2016).

Sardareh, Rashid, Saad and Boroomand (2012) reported that all self-regulated models have a direct link between SRL skills and high academic performances of students. A significant positive association was found between SRL practices and learning accomplishment as SRL refers motivation for learning and academic attainment. Garrido-Vargas (2012) used Motivated Strategies Learning Questionnaire (MSLQ) to identify the effect of SRL on students' academic accomplishment. Their study concluded that self-directed plans are useful to achieve academic success in reading, writing and mathematics. The main element of SRL that is motivation, found significantly related to academic achievements. Multiple researches have concluded that SRL sudents are actively participated in educational tasks and have high motivations (Labuhn, Zimmerman, & Hasselhorn, 2010), actively participate in classroom activities (Elstad & Turmo, 2010), and use multiple strategies to maximize their educational success (Clarebout, Horz, & Schnotz, 2010).

Self-directed students are more eager to direct, control and mange their learning performances according to their objectives. They always seek guidance from others, use different sources to facilitate their learning whenever they find difficulties in their educational tasks (Kolovelonis, Goudas, & Dermitzaki, 2011). It is founded in previous research that self-regulated learners tend to have high educational achievement and performances (Zimmerman, 2008). Self-regulated learning processes assist students to recognize strengths and weaknesses of their learning (Kistner, Rakoczy & Otto, 2010). In Cyclical Model there are three main phases of self-regulatory process (Zimmerman, 2000 & Pintrich , 2002).

Forethought Phase, student identify their educational tasks, and make short and long term goals in order to accomplish these tasks. At this stage students find many difficulties in setting goals and in execution of these goals, so parents, teachers and other experts should help them to accomplish their educational tasks. Forethought phase is further divided in two sub-stages.

Task analysis; at this step students set goals and select strategies to achieve these goals (Pintrich & Schunk, 2002). Goals are defined as set of rules to control actions of students in an educational setting. These are related to high grades of students as well as deep understanding of learned content (Zimmerman, 2004). Task analysis is divided in to sub

sets of setting goals, strategies, allocated time and resources for achieving goals (Schunk, 2001).

Next main step of this stage is based on motivational element called *Self-belief*; that is about students' self-reliance of positive outcome expectations for their educational performances. Students' intrinsic motivation helps them to stay on task without considering difficulties (Pintrich & Schunk, 2002). Self-directed students have high self-efficacy skills that help them to increase their use of SRL strategies in order to increase their academic achievement (Pajares, 2008).

Performance Phase is further divided in two stages of self-control and self-monitoring, to complete their educational tasks (Zimmerman, 2000 & Pintrich 2002). At the stage of *self-monitoring* students set goals, select strategies, stay on task and use self-monitoring and recordings in order to maintain their performance (Zimmerman, 2004). *Self control*; refers the control of students over their learning process, students use self-instructions to keep their performances on track (Moreno, 2010). Although self-regulated students cannot do all tasks by their selves, they seek help and guidance from teachers, parents and other experts (Wolters, 2011).

Self-Reflection Phase the last stage is further divided in two steps that are self-evaluation and self-imposed contingencies. After reaching successfully at this stage, students make sure the right use of SRL plan and practices that they are using to reach their goals. They use self-evaluation process to evaluate their performance by comparing their work with other students, and against the prescribed criteria of standard performance i.e. Rubrics (Zimmerman, 2004). During this phase, students use *self-imposed contingencies* in order to track their performance with success. If they found success in completing their educational tasks they reward their selves with positive contingencies and if they got fail in accomplishing educational tasks, they punish their selves with negative contingencies (Moreno, 2010). This self-reflection helps students in further planning of their educational tasks and assists them to begin SRL cycle again (Zimmerman, 2008).

In this modern age and 21-century, SRL skills are essential along with other skills needed to achieve educational success. Adolescents are specially considered valuable learners to learn SRL skills, especially secondary school students are expected to learn SRL skills in order to excellent performances (Wolters, 2012). SRL process provides the opportunities to practice self-control, self- motivation and self-monitoring in order to enhance academic achievements (Daniel, Wang & Berthelsen, 2016).

It is found in another research that students can increase the abilities of SRL by observing, imitating, internalizing the use of these skills (Xu, 2013). In order to be expert and skilled in SRL process, students need assistance and guidance from parents, teachers and other experts at early stages of SRL model. Especially secondary school students

required more guidance and help in starting phases of SRL process Zimmerman and Kitsantas (2005).

Self-regulated learning (SRL) is a complex phenomenon which is less focused in our educational setup. Currently many educators and policy makers defending that teaching of self-regulatory skills be most important goal of formal education. SRL skills are necessary not only in formal school setup to guide students for their own learning but also important in students' lives after the school. So there is need of in-depth study of SRL phases in order to inculcate SRL skills in students. The correlation of SRL and students' academic achievement was studied many times but there is limitation in studying the relationship between SRL's phases and their effects on students' academic performance. Due to this limitation, current research was conducted to explore the effect of SRL phases on students' academic attainments.

Objectives

The allied objectives of present study were to;

1.   Examine the effect of self-regulated learning phases on secondary school students' academic performance.

2.   Investigate difference in the use of self-regulated learning practices between public and private secondary school students.

The outcomes of the present research may provide constructive and modernized information on phases of self-regulated learning with regards to educational attainment of secondary school students. It may be useful for educators, teachers and policy makers with regard to instructional material based on SRL strategies. The current study may be helpful for teachers to teach SRL skills in formal setting of schools. Teachers can help their students to become lifelong learner by teaching them self-regulatory skills. Teachers can make acquainted themselves with SRL strategies and skills that are most likely constructive to gear students' academic performance.

 This research will present indispensable information to policy makers and curriculum designers in designing curricular instruction and activities based on self-regulatory skills. It may also be useful for teachers to switch their conventional teaching methods. They can adopt child-centered classroom approach and may design learning activities that encourage students' autonomy and based on self-regulatory process. Teachers may guide students to enhance their self-efficacy beliefs by engaging them in different learning task and help them to develop intrinsic motivation.

It may also be helpful for parents and educators that how they can help their child to be a self-regulated learner in an informal setting of home and academies. The results may help school educators to adopt SRL strategies within different subjects and facilitate

their students in recognizing meta-cognitive process to solve their problems and difficult learning situations at their own.

Method and Procedures

This research was quantitative in nature and causal comparative research design was used to test the causal relationship between stated variable of this research, Self-Regulated Learning (SRL) and Academic performance among secondary school students.

With respect to SRL across the age spectrum, adolescents are less considered or studied at secondary school level. The target population of this study consisted on the students who have passed secondary school certificate examination from Board of Intermediate and Secondary Education (BISE) from a metropolitan city of biggest province Punjab of Pakistan.

In current research multistage probability sampling technique was used to collect students' responses. At first stage stratified sampling technique was used to make strata's of public and private schools that were consisting of 180 public and 328 private schools from two tehsils of selected district. At Second stage, sub strata's of boys and girls were selected. In the second stage, 25 public and 38 private schools were sampled through simple random sampling technique (Gay, Mills & Airasian, 2009). At the last stage, through proportionate stratification 245 boys & 278 girls were selected from public schools and 301 boys & 274 girls were selected from private schools. Total representative sample size of the study was consisting of 1098 respondents.

Instrumentation

The instrument used in this study comprised of two parts; demographic indicators and statements related to SRL practices. With the help of standardized tool, motivated strategies for learning questionnaire (MSLQ), a self-developed academic self-regulated learning inventory (ASLI) was used to collect students' responses about their use of SRL strategies. Likert type scale (strongly agree to strongly disagree) was used in this instrument to gauge the range of students' responses. The instrument ASLI consisted of 40 items that were related to cyclical nature of SRL model. To measure students' academic performance, their cumulative grades/scores on standardized examination of BISE Lahore were collected.

The self-designed instrument ASLI was piloted to check its reliability and validity. It was administered on students of 10th grade who have passed the final examination of 9th grade. Their standardized scores were collected to get true picture of analysis.

Reliability analysis was conducted to check the internal consistency among the stages of SRL. The instrument was administered on 70 students to check its reliability. In general the reliability index for the self-regulated learning scale was found 0.93 that is

demonstrating high degree of internal consistency and preferably above the acceptable range that is 0.7 (DeVellies, 2003).

Reliability Analysis

Variables of Study	No of Items	Cronbach's Alpha
Self-Regulated Learning	40	0.93
Task analysis	9	0.77
Self-belief	7	0.80
Self-control	7	0.79
Self-monitoring	8	0.80
Self-evaluation	4	0.74
Self-imposed contingency	5	0.81

To test the validity of instrument, it was distributed to the five experts of the field. Each item was intensely conferred with them further its application was also discussed with them in order to ensure the content validity. The instrument was customized, rationalized and finalized in the light of suggestions given by field experts.

Results

In this section results of this study are presented after analyzing data.

Effect of SRL Phases on Students' Academic Performance

Table 1

Regression Coefficient -- Model Summary of relationship between SRL and Academic Performance

Model	R	R Square	Adjusted R square
1	.575[a]	.331	.325

a. Predictors: (Constant), *TA, SB, SC, SM, SE, SIC*

R shows the correspondence between SRL and academic performance that is equal to 0.575, which is a strong relationship between students' self-regulated learning and their

academic performance. R shows that there are 33.1 % changes caused in dependent variable (academic performance) due to independent variable (self-regulated learning).

Table 1.1

Regression analysis for predicting SRL and Academic Performance

Model	df	Mean square	F	Sig.
Regression	6	207974.111		.000
Residual	612	4125.147	50.416	
Total	618			

a. Dependent Variable: Academic Performance
b. Predictors: (Constant), TA, SB, SC, SM, SE, SIC

Table 1.1, demonstrates the ANOVA test for independent variable (self-regulated learning) that has momentous connection with students' academic achievement. To check whether the model is good fitted or not, F test is performed. Table shows that F value is 50.416 and P value is $0.000 < 0.05$ which is significant which shows the model is good fit.

Table 1.2

Regression Analysis for SRL dimensions predicting Academic Performance

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	129.319	17.277		7.485	.000
Task Analysis (TA)	8.648	4.612	.080	1.875	.041
Self-Belief (SB)	-.259	5.311	-.002	-.049	.961
Self-Control(SC)	11.842	5.787	.108	2.046	.041
Self-Monitoring(SM)	13.915	6.028	.128	2.308	.021
Self-Evaluation(SE)	2.022	4.445	.022	.455	.649
Self-Imposed(SC) Contingencies	32.674	5.048	.330	6.473	.000

a.   Dependent Variable Academic Performance

$$Y=\alpha + \beta_1 (TA) + \alpha + \beta_2 (SB) + \alpha + \beta_3 (SC) + \alpha + \beta_4 (SM) + \alpha + \beta_4 (SE) + \alpha + \beta_5 (SIC)$$

$$Y=\alpha + 8.64 (TA) + \alpha + -.25 (SB) + \alpha + 11.84 (SC) + \alpha + 13.91(SM) + \alpha + 2.02(SE) + \alpha + 32.67(SIC)$$

In clarification the regression coefficient of task analysis, P (0.04) < α (0.05), β= 8.64 that demonstrate considerable positive correlation. So1unit increase in task analysis will lead to 8.64 unit increase in academic performance. The regression coefficient of self-belief, P (0.96) >α (0.05), β= -0.25. The regression coefficient of self-control, P (0.04) < α (0.05), β= 11.84 that shows significant positive relationship. So1unit increase in self-control will lead to 11.84 unit increase in academic achievement. In explaining the regression coefficient of self-monitoring, P (0.02) < α (0.05), β= 13.91 which proves considerable positive connection. So1unit increase in self-monitoring will lead to 13.91 unit increase in academic achievement. The regression coefficient of self-evaluation, P (0.64) >α (0.05), β= 2.02. In explaining the regression coefficient of self-imposed contingencies, P (0.000) < α (0.05), β= 32.67 that explain noteworthy positive correlation. So1unit increase in self-imposed contingencies will lead to 32.67 unit increase in academic achievement.

Difference in Rate of Self-Regulated Learning of Private and Public Secondary Graders

Table 2

Comparison of SRL between public and private secondary school students

	School type	N	Mean	S.D	t	df
Self-regulated learning	Public	346	3.752	0.6602		
					-7.34*	604.49
	Private	273	4.080	0.4488		
	Total	619	7.832	1.109		

*p<.05 level of significance

An independent-sample t-test was used to check the dissimilarity in the use of SRL practices among public and private school learners. The result shows statistical considerable divergence between mean scores of self-regulated learning of public (*M*=3.752, *SD*=0.66 and private school students (*M*=4.080, *SD*=0.44*; t* (604.4) = -7.345,

p = .000 two-tailed). The magnitude of the difference in the mean scores (mean difference = -.328, 95% *CI*: -.41 to -.24) was large (eta squared=0.08). So consequently it is founded that private school students are more friendly in using SRL skills than public school students.

Conclusion and Recommendations

The current research is filling gaps of previous researches by providing useful results on the use of SRL skills in order to enhance students' academic performance. The social cognitive model of self-regulation was advocated by Zimmerman (2002), in current research the cyclical model of SRL was used to investigate causal relationship between the use of SRL and academic performance of secondary school students. Secondary school students are less considered in previous researchers with regard to the use of SRL processes. This study especially considered these students and recommended that they often use SRL to boost up their academic performance and increase in achievement scores. Results are consistent with previous study that self regulated adolescents are well aware about educational strengths and weaknesses that they possess (Yan, Z., 2020).

Current research was also conducted to gain in-depth insight related to practices of SRL in order to enhance students' academic performance and achievements as many of the previous studies explored this phenomenon. The results of this research are consistent with previous studies, it is found that the use of all phases of SRL are effective to enhance students' academic achievement (Cheung & Pomerantz 2011; Dotterer & Wehrspann, 2015; Jaiswal & Choudhuri, 2017; Kumari & Chamundeswari, 2015; Yan, , 2020). The results of this study found significant strong relationship between students' academic performance and the use of self regulated learning skills (Wang, King, & Rao, 2019). Furthermore the students who are self-regulated in their learning process tend to have better scores than those who are not self-regulated learners (Xiao, Yao & Wang, 2019).

It is foremost goal of education to educate students in such a manner that they can be self-directed and regulated persons in their actions. Self-regulated students have abilities to face and solve educational problems and challenges by their selves. The current study concluded SRL strategies that are considered the part of hidden curriculum, and can be taught by parents, teachers and educators so that learners may increase their learning by showing autonomous and self-confident behaviors. The present research revealed that all phases of SRL have significant effect on students' academic performance and the students who are practicing SRL skills tend to have higher grades than those who are not using SRL skills.

It is suggested that curriculum may be designed in such a way to improve students' self-regulated attitude towards learning and homework tasks. It may include practices for development of self-regulatory skills. There may be awareness moves for parents, teachers and educators for helping learners for SRL skills. As the development of SRL skills and behavior is essential for adolescents, and teachers do not have enough time to make practices of these skills in today's conventional classroom, so practitioners may consider practices of SRL in order to teach SRL skills to students. So that they can better learn by using effective skills of SRL to enhance their learning.

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