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RESEARCH PAPER

A Study of the Relationship between Self-Regulated Learning Strategies and Academic Achievement of Secondary School Learners

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ABSTRACT

Self-regulated learning (SRL) is acknowledged as a significant indicator of student academic achievement (Xiao, Yao, & Wang (2019). This research focuses on the value of the use of self-regulated learning strategies for the learning outcome i.e. academic achievement of X grade learners. In this study, the relationship between the two research variables, the use of SRL strategies and academic achievement of students, was examined. An ex-post facto research design was used for study. The study was carried out with the sample of 230 X grade students randomly selected from Faisalabad District Punjab Province, Pakistan. The instrument namely Academic Self-Regulated Learning Scale (A-SRL-S) was adapted according the local norms. The results indicate that majority of the secondary school learners make use of Academic Self Regulated Learning Strategies (ASRLS) in their academic activities. The study also found moderate level relationship between ASRLS and academic achievement of secondary school learners. Finally, students of both genders were found to be similar in their academic achievement and in the use of ASRLS for their studies. Similarly, the respondents from rural and urban localities were found to be almost similar in their use of ASRLS during their studies whereas they differ significantly in their academic achievement on the basis of their localities.

Introduction

Self-Regulated Learning (SRL) is a mechanism that allows learners to control their feelings, actions and emotions in order to better handle their learning environments (Zumbrunn, Tadlock, & Roberts, 2011). SRL is based on Social Cognitive Theory of Bandura which provides a systematic view on the development of learning ability of pupils' knowledge (Paris & Paris, 2001). Because of its relevance for learning, many studies are carried out on SRL (Schunk, 2005). The relationships between SRL and academic achievement in different grade levels have been illustrated by several studies (Lawrence & Saileella, 2019; Kathawala & Bhamani,

2015; Ningrum, Kumara, & Prabandari, 2018 and Alotaibi, Tohmaz, & Jabak (2017). The present study is an extension to the earlier research which tries to investigate the relationship between SRL strategies and student academic achievement.

Schunk (2005) argued that self-regulated students are usually considered as self-governing students. The ability of controlling their learning is aimed at studying, planning and to achieve high scores in exams. By exhibiting these traits, self-regulated students ultimately attain good academic results. Self-regulation is referred as self generated thinking, feelings, and behaviours that are directed toward achieving individual goals (Zimmerman, 2000). Furthermore, Zimmerman (2002) clarified that self regulation is a method for students to transform their mental capacity into educational abilities.

According to Panadero (2017), SRL models provide a mechanism in which students think, behave and perform on their own effort to accomplish their learning objectives. While using SRL, learners select, use, track and change learning and use strategies to regulate behaviors in order to accomplish particular learning objectives. This framework includes learners' goal setting, action control, learning strategies and academic achievement. These four components are considered to be predictive factors for academic achievement. In compared to other models, Pintrich's and Zimmerman's models have been more generally implemented.

According to Zimmerman (2000), SRL has three cyclic phases. Pintrich (2000) introduced a social and cognitive perspective based theoretical framework. Its goal was to categorize and evaluate the many causal factors in self-regulated learning. This model organizes regulation into four phases: planning, monitoring, control, and evaluation. According to a review of SRL models, these frameworks have more commonalities than differences (Panadero, 2017).

Forethought, performance, self-reflection are the main phases in SRL. According to Duckworth, Akerman, MacGregor, Salter& Vorhaus (2009) forethought phase occurs prior to involvement in learning and includes processes that set the stage for learning, primarily role review and self-motivation viewpoints. Self-observation and self-control processes that arise during learning are included in the performance phase. The process of self-reflection occurs when students respond to their efforts with self-judgments and self-reactions (Schunk & Ertmer, 2000). The self-reflection phase and performance phase are fundamental stages of self-regulated learning (SRL). SRL phases have greater impact on academic achievement (Li, Ye, Tang, Zhou & Hu, 2018).

According to Garba (2016), SRL means the ability with learners to take an active part in their learning process using some learning strategies. The learners use learning strategies including memory strategy, goal setting, self-evaluation, seeking assistance, environmental structuring, learning responsibility and organization with little guidelines from teachers or any teaching agent. Memory strategies are procedures that are used to assist in the recall of information. They include everything from outside memory aids to inside memory approaches. Self-regulation emphasizes its inherent link with goals. Goal setting involves establishing a standard or objective to as the goal of someone's behaviour and work (Locke & Latham, 1990). Self-evaluation is to systematically observe, analyze and value your own professional action. Seeking assistance could be viewed as a sort of behavioural or social self

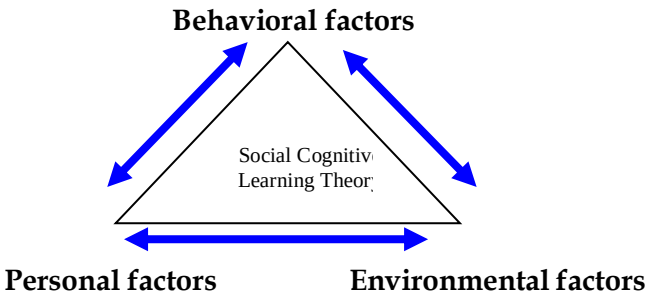
control. In an academic setting, seeking assistance may entail finishing homework or achieving satisfactory exam results (Karabenick, & Berger, 2013). Environmental structuring examines feasibility to rearrange physical settings to avoid disturbances and improve learning (Yen, Tu, Sujo-Montes, & Sealander, 2016). Responsibility for learning requires students to bear responsibility for their own learning. It ensures that learners need to spend time, energy, and effort in order to obtain understanding (Pendoley, 2019). Organization ensures that the learner will visualize, evaluate, perceive and retain information in the mind in a way that brings meaning (Weinstein, Acee & Jung, 2011). Getting organized makes it simpler for anything else. It lets you get to work more easily without spending time.

According to Harding (2018), students benefit from the use of SRL strategies. They learn finding solutions to difficult problems and how to become successful in their efforts for studies and later on in their whole life. They set goals for them to accomplish expected tasks and analyze complete work to identify what learners have achieved as they become more active and responsive for their learning. They are able to get more freedom and liberty competence as students regulate their own learning, expanding, adapting, and gaining access to learning opportunities not previously considered by their teachers (Ramdass & Zimmerman, 2011; Winne, 1997).

Duckworth & Carlson (2013) stated that owing to the impact that it has on educational and behavioral performance, self-regulation is beneficial. Self-regulation strategies can be used to actively engage students who would otherwise be inactive in their studies. Instead of perceiving school as something that unfolds to them as a result of their education, learners should view learning as an active experience that they undertake on their own (Zimmerman, 2001). Self regulated learning strategies enable learners to participate actively in their education and put them in the drivers' seat.

According to Nabavi (2012), Social Cognitive Learning Theory (SCLT) is an observation based learning theory. Individuals clearly learn by observing what others do, and human mental processes are crucial to comprehending personality. By the mid-1980s, Bandura's research had taken on a more holistic bent, and his analyses tended to provide a more comprehensive review of human cognition in the context of social learning. Soon after, the theory he developed social learning theory become known as Social Cognitive Theory (SCT). This theory provides a paradigm for understanding, predicting, and modifying human behaviour (Green & peil, 2009). In the field of self-regulated learning, major work is carried out by Zimmerman and Printrich.

This study's theoretical framework is based on Bandura's and Zimmerman work. SCLT is based upon the interactive nature of a person's behavioral, personal and environmental factors.



SCLT scholars (i.e. Betz, 2007; Green & Peil, 2009) backed Bandura's triadic reciprocality theory, defining human behaviour as a triadic, dynamic, and reciprocal interaction of personal, behavioural, and environmental factors. A closer look indicates that these three fundamentals are mutually reinforcing. (Nabavi, 2012).

Literature Review

According to Xiao, Yao, and Wang (2019), SRL is essential for academic achievement. The research explores the connection between SRL and academic achievement and found SRL as an important aspect in the learning processes of students.

According to Ergen and Kanadli (2017), SRL methods may have both important and negligible impacts on academic performance. In Turkey, a Meta analysis study was conducted by these researchers in order to explore relation between SRL strategies and academic achievement. For this, they examined 47 such studies with 21 studies being included in this sample. As a result of the research, it was found that SRL methods had a significant effect on academic achievement.

El-Adl & Alkharusi (2020) examined the relationship of Learners' motivation and achievement in academic was assessed in mathematics by using self-regulated learning strategies. 9th grade 238 students from Oman state were taken in this descriptive research design. Full numbers achieved in mathematics reflected academic achievement. According to the findings, high achievers learners were more capable of using SRL strategies and SRL was found to have statistically significant positive relationships with academic achievement. On behalf of findings, researchers recommend that the teachers must take special notice to low-achieving learners and teach them SRL strategies.

Some other researcher have also found a strong link between self-regulation and academic achievement across a wide range of grade levels and area under discussion (Altun & Erden, 2013; Bembenutty, 2011; Cheng, 2011; Dent, 2013; Duru, Duru & Balkis, 2014; Tekbiyik, Camadan & Gulay, 2013).

In Pakistan, Kathawala & Bhamani, (2015) conducted research in Karachi about private school students to investigate the effects of self-regulation skills on academic achievement. Grades 1 and 2 comprising 210 students were sample size from seven different private schools in Karachi who were chosen randomly. The results of study found that self-regulation abilities had a considerable impact on the academic outcome of these students.

Khan, Shah & Sahibzada (2020) investigated the effect of SRL behaviour on university students' academic achievement in Khyber Pakhtunkhwa (KPK), Pakistan. The research was quantitative with a sample of 480 (240 male, 240 female) students drawn using a multistage stratified random sampling technique. Data were gathered using an indigenously prepared questionnaire. The research results indicated that SRL had a significant impact on the students' academic achievement.

Material and Methods

The study, in its nature, is quantitative. It is a causal comparative study by method because the researcher wanted to explore any causal relationship between self-regulating learning strategies and secondary school student academic achievement. For this purpose, the retrospective research approach of the Ex-post-facto design was used. The ex post facto research design was chosen to answer the research questions developed to search for any relationship between dependent and independent variables on the basis of careful measurements and observation of human learning strategies and their relation to the academic achievement of learners.

The target population for the current study was all the 11th grade students of both sexes who, as students of any public school, passed their 10th grade (Secondary School Certificate Examination) conducted by Faisalabad Board**.** About 230 respondents were randomly selected as sample of the study from the Faisalabad District, of the Punjab Province. These respondents were further divided into two groups of rural and urban localities. Four institutions were randomly selected from urban areas and same number of institutions was taken from rural areas. From these four institutions of each group, two institutions were meant for girls whereas the other two belonged to boys group. Thus eight institutions were selected from the district. The researchers tried their best maintain equal number of students from both Science and Arts groups of studies. Following table is given to elaborate sample of the study.

Table 1
Add heading of table

Description	Frequency	Percentage
Boys	108	47%
Girls	122	53%
Urban	126	54.8%
Rural	104	45.2%

An instrument consisting of two parts was used in this study to collect the data from the respondents. The first part of the instrument collected the demographic information necessary for the respondents. It included personal data such as gender (male and female), urban/ rural background, and achievement score in the form of marks obtained in the BISE examination of the 10th class, etc.

A rating scale to collect responses from learners regarding self-regulating learning strategies was the second part of the instrument. For this purpose, after pilot testing and factor analysis, a five point rating scale namely Academic Self Regulated Learning Scale (ASRLS) of fifty four 54 items already developed by Magno (2010) and reliably used by Magno in the Philippines and by Mutua (2014) in Kenya was

adapted. The researcher requested permission from the author of the scale to use this instrument, which was happily granted by the author. Two more items have been included in this rating scale, in the light of expert opinion.

Thus, the final scale included 56 items. In order to make them understandable and adapted for the respondents according to Pakistani standards, the instrument was translated into the Urdu language. For the validation of these instruments, the adapted form of the instruments was presented to a panel of experts in the field of education. A pilot study was conducted after approval by a panel of experts in order to measure the reliability of these instruments after the necessary changes. The accuracy of this scale was established by pilot testing that resulted in an alpha value of 0.893 for all fifty-six items. These 56 items are grouped into seven categories: memory strategy, goal setting, self-assessment, assistance seeking, structuring the environment, responsibility for learning, planning and organizing. Finally, the tool was used to gather the necessary information for the current research endeavor.

Data Collection Procedure

The researcher reached Faisalabad district and visited the sample institutes personally for data collection. The head of institutes were informed regarding the intention of the research and were requested to cooperate in data collection process. The data were collected according to decided sample of the study to maintain its randomization. In this way almost 250 students were approached from both the groups coming in alternate days and asked to give their responses on instruments. They were made aware of the study's purpose and about their legal and ethical rights as respondents. They were given assurance that the privacy of their data will remain intact and will never be misused by any means. Resultantly, only 238 students returned back the hard copies of instruments after their responses. However, eight of these 238 instruments were not complete and majority of the questions were left blank. Thus, the responses of these eight respondents were not included in the final data. In this way, total 230 instruments were returned back in complete form.

Results and Discussion

For the purpose, three research questions were developed and the data were gathered to provide answers to these research questions. Following are the results of these research questions.

The first research question of the study was, *"Do the secondary school learners use self regulated learning strategies during their secondary school education?"* Simple descriptive procedures of the data analysis were run to answer this question. The analysis produced following table:

Table 2
Simple descriptive statistical analysis of the scale responses (n=230)

Statistics	ASRLS Score
Mean	3.5618
Median	3.6429
Mode	3.82
Std. Deviation	.45911

This table indicates that the values of all the three measures of central tendency (i.e. Mean, Median and Mode) are greater than 3.5. The response value of 3 on scale denotes neutral and response value of 4 on scale indicates agreement of the respondent. Hence, the values (Mean = 3.56, Median = 3.64 and Mode = 3.82) when rounded off, all become 4.0 which indicate the agreement of the respondents to the scale items. In other words, the majority of the students responded that they made use of academic self regulated learning strategies during their studies and academic activities.

The second question of the study was about presence of any relationship between students' ASRLS and their academic achievement. It was asked in the words. "*Is there any relationship between SRL and academic achievement of secondary school learners of the Punjab?"* The presence or absence of relationship among the variables of interest was analyzed with the help Pearson correlation coefficient analysis through SPSS. The test produced results in the shape of following table:

Table 3
Correlation analysis between achievement score and ASRLS

		ASRLS
Academic Achievement	Pearson Correlation	.564**
	Sig. (2-tailed)	.000
	n	230

**. Correlation is significant at the 0.01 level (2-tailed).

Pearson coefficient of correlation indicates that there is moderate level positive relation between academic self regulated learning strategies and Academic Achievement of secondary school learners. The values [r = .564**, n = 230, & p = .000] of Pearson Correlation Coefficient indicate the presence of moderate level relationship between both the variables which is significant even at 0.01 level.

The presence of correlation between both the variables indicate that the use of academic self regulated learning strategies by the secondary school learners can enhance their academic achievement in the form of more marks in their SSC examination. This implies that greater use of ASRLS by the learners in their studies may result in better academic achievement in their SSC examination.

The third question of the study was, "*Are there any significant differences in the use of self regulated learning strategies of the secondary school learners on the basis of their gender and locality?*" Independent Samples t test procedures were run using SPSS to answer this question. Initially, tests were carried out to measure any significant differences in the responses of boys and girls secondary school learners. For this purpose, two separate tests were carried out. The first test was to find any significant differences in the academic achievement of the respondents on the basis of their gender. Whereas the second test was run to find any significant differences in responses of boys and girls respondents on five point ASRLS scale. The analyses produced following table:

Table 4
Independent samples t test on the basis of gender

	Gender	N	Mean	Std.	T	df	Sig.(2-tailed)
Academic Achievement	Male	108	737.17	123.706	1.385	228	.167
	Female	122	714.44	124.544			
ASRLS Mean	Male	108	3.5126	.45737	-1.535	228	.126
	Female	122	3.6054	.45810			

The results of first independent sample t test indicate that there is no significant difference in the academic achievement of male and female secondary school learners, (t = 1.385, p = .167). That is, the average achievement score of males (M = 737, SD = 123.7) was not significantly different from that of females (M = 714, SD = 124.5), valid N=230.

The results indicate that there is no statistically significant difference in the academic achievement (i.e. obtained marks of SSC exams) of boys and girls. This implies that male and female respondents have almost similar results in their SSC examinations.

The results of second independent sample t test also indicate that there is no significant difference in the use of academic self regulated learning strategies of male and female secondary school learners, (t= -1.535, p = .126), that is, the average ASLRS score of males (M = 3.512, SD = .457) was not significantly different from that of females (M = 3.605, SD = .458), valid N=230.

Thus, the results show that statistically there is no significant difference in the use of academic self regulated learning strategies of boys and girls. This implies that male and female respondents are almost similar in the usage of ASLRS during their studies.

As a whole, the results indicate that male and female students do not differ in their academic achievement and in using ASRLS for their studies.

Two more tests were carried out to answer the second part of this research question. The first test was to find any significant differences in the academic achievement of the respondents on the basis of their locality. Whereas the second test was run to find any significant differences in responses of respondents belonging to both urban and rural areas on five point Likert type scale of ASRLS. The analyses produced following table:

Table 5
Independent samples t test on the basis of locality of respondents

	Locality	N	Mean	Std. Deviation	T	df	Sig. (2-tailed)
Academic Achievement	Urban	126	756.25	131.933	4.337	228	.000
	Rural	104	687.39	103.156			
ASRLS Mean	Urban	126	3.6137	.46185	1.896	228	.060
	Rural	104	3.4990	.44998			

The results of first independent sample t test indicate that there is significant difference in the academic achievement of respondents belonging to urban and rural areas, (t= 4.337, p = .000). That is, the average achievement score of respondents belonging to urban locality (M = 756, SD = 131.933) is significantly different from that of respondents belonging to rural locality (M = 687, SD = 103.156), valid N=230.

The results indicate that there is statistically significant difference in the academic achievement (i.e. obtained marks of SSC exam) of respondents belonging to rural and urban localities. This implies that respondents belonging to urban and rural areas have shown different results in their SSC examinations. The academic achievement of respondents belonging to urban localities was significantly higher than the achievement of respondents belonging to rural localities.

The results of second independent sample t test indicate that there is no significant difference in the use of academic self regulated learning strategies of respondents belonging to urban and rural localities, (t= 1.896, p = .06), That is, the average ASLRS score of respondents belonging to urban localities (M = 3.6137, SD = .46185) was not significantly different from that of respondents belonging to rural localities (M = 3.499, SD = .44998), valid N=230.

Thus, the results show that statistically there is no significant difference in the use of academic self regulated learning strategies of respondents belonging to urban and rural localities. This implies that respondents belonging to both urban and rural areas are almost similar in their usage of ASLRS during their studies.

As a whole, the results indicate that respondents belonging to urban and rural localities differ in their academic achievement whereas they do not differ in their usage of ASRLS for their studies.

Discussion

Primarily, the present study was an effort to provide answers to three research questions regarding the use of SRL strategies. The first research question was "do the secondary school learners use self regulated learning strategies during their secondary school education?" The findings of the present study confirm that majority of the secondary school learners make use of academic self regulated learning strategies in their academic activities in Faisalabad District of the Punjab province. This is in line with the findings of some previous studies like (Bono & Bizri, 2014; Duru, Duru & Balkis, 2014; Altun & Erden, 2013; Dent, 2013; Tekbiyik, Camadan & Gulay, 2013) who found that learners make use of ASRLS or suggested to use ASRLS in their studies.

Further, this study also tried to answer the question "is there any relationship between SRL and academic achievement of secondary school learners of the Punjab?" The findings of the present research having values [r = .564**, n = 230, & p = .000] of Pearson Correlation Coefficient indicate the presence of moderate level relationship between SRL strategies and academic achievement even at 0.01 level. This is in line with previous studies like that of Alotaibi, Tohmaz, & Jabak (2017) who found a significant and positive relationship between SRL and academic achievement of learners. Ningrum, Kumara, & Prabandari (2018) also found a weak positive association between SRL and academic achievement (r = 0.256,

p > 0.05). Their study shows that the students who had good SRL had good academic achievement.

Our findings are also consistent with those of Kathawala & Bhamani (2015) who found that SRL skills had a significant impact on the academic outcome of young children in private schools of Karachi. The findings of Lawrence & Saileella (2019) also claim the presence of positive relationship between self-regulation and achievement in mathematics of higher secondary students. SRL methods, according to Ergen and Kanadli (2017), have both significant and minor effects on academic performance. In short, our finding is consistent with these research studies.

Our study also tried to answer the research question "is there any significant difference in the use of self regulated learning strategies of the secondary school learners on the basis of their gender and locality?" The findings *(t* = 1.385, *p* = .167) of our study indicate that male and female students do not differ in their academic achievement because the mean score for academic achievement of males (*M* = 737, SD = 123.7) was not significantly different from that of female learners (*M* = 714, SD = 124.5).

Again the result (*t*= -1.535, *p* = .126) of our study indicate that male and female students do not differ in using ASRLS for their studies because the mean ASLRS score of males (*M* = 3.512, SD = .457) was not significantly different from that of females (*M* = 3.605, SD = .458). Our findings are consistent with the findings of a recent study conducted in our local settings by Shah, Malik and Akhtar (2020) who found that male and female students of 8th grade do not differ in their academic achievement. Similarly our findings are similar to the findings of Yukselturk & Bulut (2009) who found no statistically significant mean differences among self- regulated learning variables with respect to gender. Our findings also support the findings of Uka & Uka (2020) who claimed no significant gender differences in school students' SRL (males mean= 3.61 SD=0.65 & females mean = 3.71 and SD=0.54 and P=0.46). Their mean values are also consistent with the mean values of the present study.

As an answer to the second part of this research question, the respondents from rural and urban localities were found to be almost similar in their usage of ASRLS during their studies [(*t*= 1.896, *p* = .06), (urban *M* = 3.61, SD = .46), (rural *M* = 3.49, SD = .449)]. However, the results of our study [(*t*= 4.337, *p* = .000), (urban *M* = 756, SD = 131.93), (rural *M* = 687, SD = 103.15)] indicate that respondents differ significantly in their academic achievement on the basis of their belongings to urban and rural localities.

Our findings are in line with the findings of Kumar, & Banerjee (2017) who found prospective teachers of rural and urban localities having SRL alike. Similarly, the findings of our research are consistent with the findings of Alokan & Arijesuyo (2013) who found that academic achievement of secondary Schools learners belonging to urban and rural areas differ significantly whereby mean scores of respondents from urban area were greater (M = 2.64, SD = 1.49) than those belonging to rural areas (M = 2.48, SD =1.33). Our results are also similar to the results of Faisal, Shinwari & Hussain (2017) and Shah, Malik & Akhtar (2020) who found that students belonging to urban and rural areas differed in their academic achievement.

Conclusions

On the basis of the results of the present study, it can be concluded that majority of the secondary school learners make use of ASRLS in their academic activities in Faisalabad District of the Punjab province. Furthermore, it also established the presence of moderate level relationship between ASRLS and academic achievement of secondary school learners for the given sample. Finally, it is also concluded that male and female students do not differ in their academic achievement and in the use of ASRLS for their studies. However, the respondents from rural and urban localities were found to be almost similar in their usage of ASRLS during their studies whereas they differ significantly in their academic achievement on the basis of their localities.

Recommendations

On the basis of the findings of the study, it is suggested that the society should ask teachers to guide their students to make use of self-regulated strategies in order to excel in their academic pursuits. Owing to prevailing COVID-19 pandemic, the study was delimited to one district only. It is suggested that such studies need to be carried out after the pandemic in entire province. It might be necessary to part SRL of the curriculum at all levels in the country. Awareness to the parents as well as to the students to communicate the benefits of using SRL should be made through the media so that the academic achievement may be enhanced.

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