Self-regulation and Academic Achievement: a comparative analysis of high and low academic achievers

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Abstract

The present study was designed to analyze the relationship of self-regulation and academic achievement among high and low achiever undergraduate students. According to Baumeister, Heatherton and Tice (1994) self-regulation skills help to control the thoughts and task performance in individuals. Students who possess more self-regulatory skills perform better in academics compared to those who are low in self-regulation. To understand the problems associated with underachievement, it is important to measure the level of self-regulation of high and low academic achievers. A sample of 450 male and female undergraduate students, divided into high (n = 250), and low (n = 200) achievers were drawn, with an age range of 20-24 years (M = 22.07, SD = 9.87) years. Findings indicated that controlled self-regulation is negative predictor of academic achievement and autonomous is positive predictor of achievement. High academic achievers were more self-regulated than low academic achievers and gender differences in self-regulation also found. Male students were significantly more self-regulated than the female students. Results have been discussed in terms of the importance of self-regulation to manage problems related to academic achievement and learning effectively.

Keywords: self-regulation, academic achievement, high achiever, low achiever[4]

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Education has major role in developing a controlled, creative and socio-morally civilized society. It not only enables an individual to become a positive member of society but also guides to achieve one's goals successfully. To accomplish goals desirably, self-regulation or self-disciplining is necessary in all walks of life from educational to social and occupational. Baumeister et al. (1994) defines self-regulation as thoughts, feelings and actions adapted to complete task plans. It is an ability to control and alter one's own behavior to pursue or complete the tasks effectively that enables the individual to exert control over thoughts, feelings, and task performance (Baumeister & Vohs, 2004). Individuals with high self-regulation possess greater tendencies to plan, are able to make better strategies for achieving goals and take practical decisions to be successful (Bandura, 1986). Self-Determination Theory suggests there are two types of motivations internal and external (Ryan & Deci, 2000), with regulations that are labeled as controlled and autonomous. Controlled motivation reflects external regulation of behaviour where behavior is directed by external rewards and punishments; and autonomous regulation where regulation is self-directed and independent (Deci & Ryan, 2008a). It is like an internalized process of taking decisions for successful attainment of goals and achievements.

Many studies point out that there is a positive relationship between self-regulation and academic achievement (Boekaerts & Corno, 2005). Some studies pointed out the importance of behaviour control development in early school years and its positive relation with achievement of students (Diamond, Barnett, Thomas, & Munroe, 2007; Dent & Koenka, 2015). Some researchers pointed out the importance of class activities in the development of goal setting and planning of students (Alotaibi et al., 2017; Mikkänen, Perry, & Järvelä, 2015). Self-regulation enables students to be proactive and manage their studies properly (Sahranavard, Miri, & Salehiniya, 2018; Veas, Gilar, & Minano, 2016). When young students achieve their goals successfully, they get confidence to accept challenges and fulfill the tasks successfully in life ahead. Generally, many students remain behind their peers in academics. Nearly three decades ago, an underachiever was mostly considered as low in cognitive abilities (Nagaraju, 2004; Nolen, 2007). But the results of several studies now indicate different factors cause underachievement that include lack of motivation, poor study skills, poor concentration, low self-confidence, low self-regulation, fear of examination, test anxiety,

and poor or low self-concept (Lin, 2001; Rana & Kausar, 2011; Sirohi, 2004).

Self-regulatory learning is based on setting of goals, e.g. good learning techniques; good time management and positive self-concept (Bandura, 1997). Findings of study by Ozan, et al. (2012) on University students pointed out that self-regulated students were also higher on self-efficacy. During challenging situations individual need to remain composed and energetic to overcome the situation successfully. Academic life at higher studies level demands multitasking ability among students to meet the challenges in future life, so they believe on oneself and non-impulsive attitude reduce the risk of failure in the completion of tasks (Pressley, 1995; Schunk & Ertmer, 2000; Zimmermann, 2000). Individual differences exist in self-regulation, but can be molded at any age (Tangney, Baumiester, & Boone, 2004; Veas, Gilar, & Minano, 2016). Martinez-Pons (2002) for example reported, guidance of parents to improve their children's academic self-regulation has positive effects on the learning skills of students and it encourages them to take more interest in their studies. One reason for improved self-regulation from parents is feedback; parents and teachers' involvement in children when they study is highlighted by their feedback, which enhances self-awareness in children, and has direct relationship with the self-control in them (Carver & Schier, 1990; Mikkänen, Perry, & Järvelä, 2015). Kornel and Bjork (2007) conducted a study to measure the relationship of self-regulation with decisions about study hours that how long to study and when to stop; study material that study from text books or from any short paragraph or flash cards; and preferred ways of study included whether prepare for detailed answer or for short answers. Results indicated that 75 % of the students reported they do not do any planned study rather start studying on the situational basis such as for any class test, midterm, or class assignment and their way of studying adapted by their intuition. Nearly 56% students reported they do not find any difference in studying for essay type and short answer and multiple-choice items. They prepare on urgency or triage basis rather than long term self-regulatory learning process. It shows that to achieve long-term learning habit to be successful as learner required self-regulation rather intuition or any short-term process.

Individuals with self-regulation use cognitive strategies to attain long term goals (Shoda & Mischel, 1996). There are four components of self-regulation (a) Standards, (b) Motivation, (c) Monitoring, and (d)

Willpower (Baumeister, Gailliot, Dewall, & Oaten, 2006). Self-regulated individuals have standards of desirable behavior, remain motivated to meet the standards, monitor the situations and have considerable internal strength (will power) to control their urges. For this, Baumeister et al. (2006) pointed out; self-regulation required internal energy to effect behaviour in different situations. If energy decreased the individuals were unsuccessful in their efforts to remain self-regulated (Baumeister & Vohs, 2004). This state of ego-depletion (reduction in energy) introduces failure in accomplishing any task. Many studies suggested this depletion can be reduced by doing regulation-related exercises, which improves self-regulation (Baumeister et al., 2006; Tangney, Baumeister, & Boone, 2004). Individuals with a regulated schedule in life like exercising regularly were found to be more controlled, give more time to study, watch less television, smoke less and spend less money habitually (Baumeister et al., 2006).

Rationale of the study

The ability of self-regulation is important for students to stay away from distraction, to manage their time effectively, and to concentrate on academic tasks (Baumeister & Vohs, 2004; Deci & Ryan, 1991). All students need to be self-disciplined and to learn effective ways of studying and achieve academic goals successfully (Sarwar et al., 2009). Attainment of better academic goals requires well-disciplined attitude, purposeful thinking and self-regulation. Several empirical studies (Robyak, Downey, & Ronald, 1979; Nagaraju, 2004) on educational problems point out, many students work below their expected level of cognitive abilities and sometimes even bright students show below average or poor achievement because of the lack of self-control or self-disciplining qualities. Therefore, a large part of intellectual potential gets wasted.

Very few empirical studies on self-regulation have been conducted in Pakistan, specifically in Sindh, to understand the problems students face in terms of academic achievement. One way to pioneer this area would be to measure and compare the self-regulation in low achievers and high academic achievers to understand their learning problems. Thus, the present study was designed to analyze the relationship of self-regulation with academic achievement and differences in the self-regulation of high and low academic achievers. The study also aimed to explore the differences in self-regulation of male

and female students. We assumed a positive relationship among controlled, autonomous self-regulation and academic achievement (as above studies indicated). We also assumed that controlled and autonomous self- regulation would be significant predictors of academic achievement in high achievers. It was also assumed that high achievers will be higher in self-regulation than low academic achievers. And finally assumed that male would be more self-regulated (controlled, autonomous and total) and academically high achieving than females.

Method

Sample

A purposive sample of the study consisted of 250 male and 200 female undergraduate students of Sindh University, Jamshoro with an age range of 20-24 ($M = 22.07$, $SD = 9.87$) years. Participants consisted of BS students (part III and IV) were taken as sample because they had their mark sheets that were used as indicators of their academic achievements. The participants with GPA 3.00 or more were placed in the group of high academic achievers and participants having GPA less than 2.50 were categorized as low academic achievers (see Table 1 for more details on the sample).

Table 1

Characteristics of the Sample

Variables	F	(%)
Age Range (Years) = 20-24 *(M = 22.07, SD = 9.87)*		
Academic Achievement		
High Achievers	250	(55.55)
Low Achievers	200	(44.44)
Academic Achievements across Gender		
High Achievers (Male)	150	(33.33)
High Achievers (Female)	100	(22.22)
Low Achievers (Male)	100	(22.22)
Low Achievers (Female)	100	(22.22)

Instruments

Personal information Schedule Personal information form was used to gather background information of the participants. Information about age, gender, educational level, socioeconomic class, and academic

achievement in terms of GPA was collected. To ascertain their academic achievement photocopy of their marksheets were also collected before data collection.

Learning Self-Regulation Questionnaire (SRQ-L) This questionnaire was developed for college and university students (Williams & Deci, 1996), and was adapted by Black and Deci (2000) a little later. The scale consists of three parts with each part having four items, a total of 12 items. Each item is measured on a 7-point Likert-type scale with responses that range from not at all true (1) to very true (7). The items on SRQ-L are divided into two subscales that measure self-regulations in terms of controlled (external regulation) and autonomous (internal regulation) regulations. It is a standardized instrument to measure self-regulation of adolescents. The Cronbach's alpha coefficients of subscales runs from 0.65- 0.77 and CFA analysis had an acceptable fit which shows construct validity (Black & Deci, 2000; Ryan & Connell, 1989; Williams & Deci, 1996). Urdu version of the scale was used in the study, which was translated by a professor of Urdu and back translated by a professor of English. The translated English version matched very well with the original version of the English scale. A final review was carried out by professor of psychology which include proof reading and final formatting of the scale. In the original scale word "Chemistry" was replaced by "study", in Urdu version. Then Pilot testing of the translated version revealed moderately high reliability status (Cronbach α = .79) of the scale.

Design and Procedure

The present study uses a cross-sectional research design, where data collected from participants on SRQ-L and academic achievement measures were analyzed by descriptive statistics, correlation (Pearson Product Moment), and one-way Analysis of Variance (ANOVA).

Directors and chairpersons of different departments at Sindh University were approached by the researcher and permission for data collection was sought. All participants signed informed consent forms if they were willing to participate in the study. It was made clear that data collected from SQR-L and mark sheets would remain confidential and will only be used for research purpose only. Participants were told that they were free to ask questions at time before, during and after SQR-L completion. They were told that there were no right and wrong answer on any item of the SQR-L and they should try to respond to each item

truthfully. Verbal instructions were also given on the first page of the survey packet that contained personal information schedule, SQR-L and self-reported marks for mark sheets. Data were collected in classrooms where participants completed the survey in groups. Participants took about 20 minutes to complete the survey.

Results

Table 2 below displays significant correlations between academic achievement and autonomous (r = .52), controlled (r = .62) and total self-regulations (r = .40) supporting our first hypothesis.

Table 2

Correlation Coefficient between Academic Achievement and Self-regulation (N = 450[†])

Variables	Controlled Self-regulation	Autonomous Self-regulation	Self-regulation Total	Academic Achievement
Controlled Self-regulation	-	-.54**	-.84**	.62**
Autonomous Self- regulation		-	.03	.52**
Self-regulation total			-	.40**
Academic Achievement				-

*† df = 448, ** p < .01*

Table 3 below presents linear regression analysis of high and low academic achievers for controlled self-regulation, autonomous self-regulation and academic achievement. The results indicated a statistically significant predictor value of autonomous self-regulation (*ASR β* = 453, *p* = .001) of academic achievement whereas controlled self-regulation revealed as negative predictor of academic achievement (*CSR β* = -.371, *p* = .001). The R squared value indicated that self-regulation explains 25.8% of variance in the academic achievement *(R² = .258, F (CSR)* = 155.56, *ASR* = 97.243, *p* = .001). The negative beta value of controlled self-regulation shows - .371 decreases in the level of academic achievement with every 1-point increase in the level of self-regulation.

Table 3

*Linear Regression Analysis for Comparisons between High and Low
Academic Achievers for Controlled, Autonomous and Academic
Achievement (N = 450†)*

Predictors	R	B	SE	t	p
CRS	.508	- .371	.003	12.47	.000
ASR	.551	.453	.006	5.400	.000
R^2	.258				
F (CSR)	155.56				
(ASR)	97.24				

Table 4 below displays comparison of high and low academic
achievers on controlled and autonomous self-regulation. *t-value* is used to
ascertain differences in the self- regulation. Results are indicating
significant statistical differences between high achievers and low
achievers on self-regulation. High achievers had more autonomous self-
regulation (*t = 12.47, p <*.001; *M H. achievers = 40.67, SD = 4.55, M low
achievers = 33.09, SD = 8.16*) whereas low academic achievers were
higher on the controlled self-regulation (*t = 10.77, p < .001; M H.
achievers = 22.52, SD = 3.51, M low achievers = 26.01, SD = 3.27*).
According to findings low achievers have less autonomous regulation as
compared to high achievers.

Table 4

*Comparisons between High and Low Academic Achievers for Controlled,
and Autonomous self-regulation (N = 450)*

Variable	Academic Achievers			95%CI	
	High Achievers	Low Achievers	t (448†)	LL	UL
Cohen's d					
Autonomous Self-regulation 1.117	M (SD) 40.67 (4.55)	M (SD) 33.09 (8.16)	12.47***	6.38	8.47
Controlled Self-regulation 1.02	22.52 (3.51)	26.01 (3.27)	10.77***	4.12	2.85
Self-regulation total 0.65	63.09 (4.47)	59.08 (7.38)	7.10***	2.89	5.11

†degrees of freedom, *** p < .001

To ascertain gender differences in the academic self-regulation of high and low achievers' one-way analysis of variance was used. Table 5 is indicating statistically significant differences [F (3,446) = 52.285, p = .000; CSR = 62.502, p =.000; ASR=108.28, p =.000] in the self-regulation of male / female high and low academic achievers. Thus, Hypothesis about gender difference is accepted.

Table 5

One-way Analysis of Variance for comparison of male and female high and low academic achievers (N=450[†]) on self-regulation

Variables	High Achiever		Low Achiever			
p	*Male*	*Female*	*Male*	*Female*	*MS*	*F*
	M(SD)	*M(SD)*	*M(SD)*	*M(SD)*	*btw gp*	*within gp*
CSR	21.30(2.69)	24.31(3.83)	25.62(2.48)	26.42(3.86)	647.88	10.36
.001						
ASR	42.03(4.00)	38.71(4.58)	37.19(3.02)	29.01(9.50)	3477.60	32.11
.001						
TSR	63.07(4.65)	63.14(4.23)	62.83(2.51)	55.36(8.63)	1524.17	29.15
.001						

Note. (ASR= autonomous self-regulation; CSR = controlled self-regulation; TSR = total self-regulation)

Table 5 shows significant gender differences in the self-regulation of male and female participants. Males are higher on self-regulation than the females.

Discussion

Findings of the study revealed a significant positive relationship between self-regulation and academic achievement of students. Low achievers were found to have low autonomous self-regulation than high achievers. It suggests that low achieving students need to be self-disciplined rationally to achieve better grades in studies, not only due to the pressure of some external factors. External factors may include parents, teachers, peers, social pressure, sibling's comparison etc. Controlled self-regulation found as negative predictor of academic achievement, whereas autonomous self-regulation is positive predictor of academic achievement. High academic achievers appeared having more autonomous and internalized self-control than the low academic

achievers. These results are consistent with the previous studies (Abar & Eric, 2010; Kathawala & Bahamanoi, 2015; Vanderstoep, Veek & Peetsma, 2008). Results also indicated significant gender differences in self-regulation of participants. Male high achievers found more self-regulated than the females. These findings are in line with the previous studies (Weis, Heikamp, & Trommsdorff, 2013).

Findings are indicating a direct and positive influence of an internalized self-motivated regulation on academic performance. Self-regulated learning refers to the ability of students to set a strategic plan for learning which helps them to get organized, focused and to complete academic and learning tasks on time in a better way (Fauzi & Widjajanti, 2018). Consequently, self-disciplined students achieve better grades, show better performance in academics as compared to those with low and externalized self-regulation. So, it is important for teachers and parents to guide students about being self-disciplined to solve their learning problems and for improving their performance in academics. The use of effective strategies to solve learning problems help students to build self-assurance about their abilities and skills, develops positive self-concept and enable them to exert effort consistently (Daniela, 2015; McClelland & Cameron, 2011).

University or higher studies demand students to be multi-tasking, which need better time management and planning to meet the challenges of practical life. Previous studies are indicating clearly that internal motivation to regulate oneself is an asset which empower students to act effectively in any challenging situation in life ahead because it is observed that success in the academic goals increase their confidence on themselves and develop passion to learn (Nota & Zimmerman, 2004). Self-regulation as a skill can be learned at any age, although the best period is the time of early education. If at that time teachers and parents pay attention to develop such skills in students it will be fruitful for their future learning.

Poor academic grades at any level of education tends to develop poor self-concept, negative thinking about one's own abilities and lack of motivation to do efforts to achieve desirable goals (Law & Norlizah, 2015; Maheen & Zahid, 2016). After remaining unsuccessful in attaining better grades, mostly students usually start to put in minimal efforts and attribute their failure to different causes such as lack of ability, difficult tasks, teacher bias, or inability and luck or fortune etc. This negative

thinking style leads to less responsible behaviour towards academic learning. Low or underachievers need more attention and guidance from teachers and parents. Several studies reported (Aksan, 2009) that low self-regulation reduces academic motivation which negatively affect learning abilities of students. They start neglecting academic tasks and lose their interest in studies which increases their academic problems more. Low achievers need to understand that they must talk to teachers and parents about their problem areas in academics and learning, at any age, because through open communication they will better able to understand their weak points and can get knowledge about their poor strategies to learn. Academic achievement is positively related with the motivation to learn for student (Ryan & Deci, 2000). It is generally observed that when students have motivation, they do every effort to complete their tasks, complete homework or assignments on time (Mirhosseni, Lavasani, & Hejazi, 2018), on the other hand students with low or external regulation waste their time of studying and learning in less important activities. Learning self-regulation demands proper strategy making to achieve goals and enables to set future goals (Fonteyne et al., 2010). The self-regulatory learning skills include consistent behaviour, proper time management, perseverance, effective and useful problem-solving strategies (Pajares, 2000).

Students need to realize and understand the importance of using useful strategies to overcome failure and to be successful (Paris & Oka, 1986). Besides providing guidance about the use of self-regulatory strategies for learning, the praise and positive comments by teachers on the successful attainment of goals by students increase their motivation to learn. The comments of teachers and parents about the strategies used by students and remain fruitful, use of time management methods and about different ways of learning applied for the completion of academic tasks successfully can be helpful in developing trust and to promote self-regulation within students. Students are not aware of self-regulation strategies, it is the duty of teachers and parents as adults to guide them properly (Mirhosseni, Lavasani, & Hejazi, 2018). Students' prior learning techniques, future goals, interests, peers and environment at educational institution and at home influence their learning skills and development of self-regulation. Parents can also play important role in the development of self-control and adequate self- management through setting the right example as role models.

The concept of self-regulation should be introduced to students, by teachers and parents, at the early years of education because of its significance for effective learning and better achievement. The   school teachers should be trained through workshops and seminars to introduce positive study skills and self-regulation among students, especially the low or underachievers. The self-regulation training will be beneficial for young adolescents to improve their learning skills for better academic performance. Therefore, seminars and training workshops should be arranged in colleges, schools and universities to provide information about the strategies of regulating oneself positively.

To gain a more comprehensive insight about the issue, future researches should focus on the comparison of self-regulatory attitude between students of private and government institutions as well as on the primary school level which is the foundation time of learning skills.

Conclusion

It is concluded that there is a direct relationship between self–regulation and academic achievement of students. Low achievers have less self-regulation than high achievers. Gender differences also found in self-regulation; male students have higher self-regulation as compared to female University students. Skills to regulate oneself provide help in the organization and management of learning and positively influence the level of academic achievement of students. Low achievers need to learn to be more self-controlled and disciplined to solve their academic problems. Therefore, it would be more beneficial, if students are provided awareness about the worth of self-control and regulation. Although self-regulation can be learned at any age but if efforts are made from the early years of education, this would have a better impact on the academic success and learning skills of students.

Limitations and Suggestions

The limitation of the study is that only the sample from one University recruited so results are not widely generalized.

Therefore, it is suggested that in future more studies be conducted on this topic with large sample and with data from different Universities to have more comprehensive insight about the relationship of self-regulation with high and low academic achievement.

Implications of the Study

1) Awareness must be spread via social-electronic media for students to know about the importance of self-regulation and good academic achievement.
2) Teachers and parents need to focus on low academic achievers and must try to guide them about the importance of self-regulation from earlier education years.
3) The self-regulation can be learned at any age, although early years of education are important to develop self-disciplining in students to become effective learners.

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