Academic Resilience as Predictor of Academic Achievement among Secondary School Students

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Abstract

In the present system of education, understanding of the factors associated to academic achievement is essential and research studies have supported that academic resilience is a major factor influencing the academic achievement. Present study explores the association between these two variables and concluded academic resilience as predictor of the academic achievement with special reference to gender. For this purpose, academic resilience scale developed by Mallick and Kaur was employed on a sample of 488 students studying in Class XI of various schools in Amritsar district of Punjab. The percentage scores of the previous class were taken for academic achievement. Multiple Linear Regression analysis was employed on the total scores as well as on the scores of male and female students. Results revealed that the four dimensions of academic resilience viz. academic confidence, sense of well-being, motivation and ability to get goals, relationship with peers and adults and emotional regulation and physical health are capable of predicting the academic achievement of students.

Introduction

Every nation aims for the production of skilful and developed human resources and achievement of this objective depends upon the highly qualitative education system (Mwangi et al., 2015). Despite the provision of the quality education, problem of lessening the school enrolment and expansion in students drop-out ratio is striking high at global level (Pandita, 2015) and this is considered as the biggest problem of the world (Hammack, 1986 Canada Manpower

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and immigration, 1990).The statistics provided by Global Education Digest Report, 2012 and Census of India, 2011 emphasised on the rising rate of drop-out and this statistics can be attributed to various personal and scholastic factors (Pandita, 2015; Karabiyik, 2020).

Students themselves cited a variety of school, family and work related reasons for the problem of dropouts (Bridgeland, DiIulio, and Morison, 2006; Rotermund, 2007). Poor academic performance, lack of coping with school activities and work (Rotermund, 2007), gender disparity, boredom at school, type of faculty and their behaviour, level of difficulty of course, lower accessibility, lack of satisfaction with school's physical and emotional environment, change of residence and social mobility are other some reason cited in the research studies (Simsek, 2013; Peer, Hillman and Hoet, 2015). Such factors contribute towards academic stress, poor scholastic performance, high level of dissatisfaction, precariousness and poor interpersonal relationships (Franco, 2015; Peer, Hillman, and Hoet, 2015). In such situations some students decided to change the school or discontinue the studies but majority of them survive in such adverse circumstances and conditions. Although there are varied number of students whose academic accomplishment is poor and continues to be poor whole year (Dauber, Alexander, and Entwisle, 1996), there are remarkable number of other students who control the adverse situations and excel in the academics (Jimerson, Egeland, and Teo, 1999) and those termed as resilient (as cited in Martin and Marsh, 2006).

Resilience is a multifaceted term including various dimensions viz. emotional, social and academics, etc. Generally, resilience is termed as a way, capacity for or outcome of successful adjustment despite adverse situations (Howard and Johnson, 2000). Resilience, with reference to academics is considered as "the probability of favourable educational outcomes and other life consummations irrespective of adversities caused due to previous attributions, situations and experiences" (Wang, Haertel, and Walberg, 1994). In the viewpoints of Alva (1991), "The students who succour academic excellence and motivation irrespective of the presence of exasperating and difficult learning conditions that may lead towards the peril of lower academic performance are considered to be academically resilient." As a construct, academic resilience is considered to be a dynamic developmental process that involves the protective qualities associated with individual students (internal protective factors) and their environments (external protective factors) that contribute to the adjustment and academic success of at-risk students (Luthar, Cicchetti, and Becker, 2000).

Academic achievement is considered as one of the appropriate indicator of academic competence and resilience for school age children (Masten and Coastworth, 1998). Research studies have suggested that resilience can significantly affect teaching leaning process and expectancies of life of students and academic achievement is at the top of that (Macharia, 2011; Kwena, 2007; Sarwar et al., 2010; Murugami, 2002). Some studies examined positive correlation between academic resilience and academic achievement (Gonzalez and Padilla, 1997; Dass-Brailsford, 2005; Lee, 2012; Hanson and Austin, 2003).

Past researches have revealed mixed results related to academic resilience and academic achievement. Some studies examined academic resilience as significant predictor of the academic achievement (Abolmaali and Mahmudi, 2013). Study conducted by Mwangi et al., (2015) and Rao and Krishnamurthy, (2018) revealed that academic resilience had a positive correlation with academic achievement.

As far as gender variation is concerned, researches have revealed that gender variation exists in the levels of academic resilience and academic achievement. Researches had suggested that females had high levels of academic resilience as compare to males (Mbindyo, 2011; McLafferty, Mallet and McCauley, 2012; Allan, Mckenna and Dominey, 2013; Mwangi and Ireri, 2017; Mwangi et al., 2018). However, some studies also suggested that male students have high level of academic resilience and academic achievement (Sarwar et.al., 2010). So the present study aims to investigate whether academic resilience can predict the academic achievement of adolescent students.

Objectives

1. To study the Academic resilience make-up of the secondary school students.
2. To study the relationship between academic resilience and academic achievement.
3. To study whether academic achievement can be predicted by any dimension of academic resilience.

Research Questions

1. What is the academic resilience make-up of the secondary school students?
2. What is the relationship between academic resilience and academic achievement?
3. Can academic achievement be predicted by any dimension of academic resilience?

Method

The population considered for the present study was the students of twelve grades (Commerce stream) of all the schools affiliated to CBSE Board of Amritsar district. A list of all the schools was taken from the District Education Officer. Through random sampling technique, a sample of

488 students was selected from 6 schools of Amritsar district. Firstly, a demographic detail sheet was filled by the students and the Academic resilience scale (Mallick and Kaur, 2016) was administered on them. Scale has been developed on five point Likert scale as (strongly agree, agree, undecided, disagree, strongly disagree). Scale was having five dimensions as academic confidence, sense of well-being, motivation and ability to get goals, relationship with peers and adults, emotional regulation and physical health. The reliability coefficient of the scale measured through Cronbach Alpha is 0.78 and by split-half method of reliability it is calculated as 0.84 which is highly acceptable. The scale is comprised of total 52 items (41 positive and 11 negative items). Proper instructions were given to the students regarding answering of the items and they were assured that this information will only be used for research purpose. Later on scoring of the collected sheets was done according to the scoring key given in the scale.

Analysis and Discussion

R.Q.01: What is the academic resilience make-up of the secondary school students?

There are five levels of the scale on the level of academic resilience of the students viz. High, Above Average, Average, Below Average, Low.

Table 1 represents the break-up of the sample with respect to different levels of the academic resilience and gender. It shows that maximum number of students have average academic resilience.

R.Q.02: What is the relationship between academic resilience and academic achievement?

Normality pattern in the data sets was examined through the application of the Shapiro-Wilk's test. Findings indicated that computed value of Shapiro-Wilk's test statistic was 0.982 which associated with a fairly low (0.00275) value of p. So, it could be concluded that normality pattern in the available datasets was at a doubt.

Table 1: Levels of Academic Resilience

S. No.	Levels of academic resilience scale	Total number of students		
		Female	***Male***	***Total***
1.	High	35	37	72
2.	Above Average	32	39	71
3.	Average	72	75	147
4.	Below average	41	47	88
5.	Low	58	52	110
	Total	238	250	488

Studying Association between Academic Achievement and Different Dimensions of Academic Resilience

Due to the general tendency of non-normality in the datasets, (non-parametric) Spearman's rank correlation method was resorted for the purpose of studying association between academic achievement, and the different dimensions of academic resilience. Computed values of the correlation coefficient have been presented in Table 2 below:

Table 2: Spearman's Rank Correlation Analysis in Respect of Academic Achievement and Different Dimensions of Academic Resilience

Gender	Variable-1	Variable-2	Corr. Coeff. (rSp)	p-Value	Significance
Male	**Academic Achievement**	Academic confidence	0.201	0.0013	**
		Sense of well-being	0.163	0.0098	**
		Motivation and ability to get goals	0.253	0.0001	***
		Relationship with peers and adults	0.235	0.0002	***
		Emotional regulation and physical health	0.255	< 0.001	***
		Total	0.292	< 0.001	***
Female	**Academic Achievement**	Academic confidence	0.166	0.0100	*
		Sense of well-being	0.140	0.0304	*
		Motivation and ability to get goals	0.234	0.0003	***
		Relationship with peers and adults	0.193	0.0027	**
		Emotional regulation and physical health	0.213	0.0009	***
		Total	0.258	0.0001	***
All	**Academic Acheivement**	Academic confidence	0.185	< 0.0001	***
		Sense of well-being	0.153	0.0007	***
		Motivation and ability to get goals	0.242	< 0.0001	***
		Relationship with peers and adults	0.211	< 0.0001	***
		Emotional regulation and physical health	0.229	< 0.0001	***
		Total	0.273	< 0.0001	***

***: Significant at 0.1% probability level; **: Significant at 1% probability level; *: Significant at 5% probability level; No. of degrees of freedom for rSp : For Males = 250; For Females = 238; For All = 488.

Main Implications from Table 2

The nature and extent of association between academic achievement and the academic confidence was considered. For the two variables, the computed value of Spearman's correlation coefficient (r_{Sp}) was +0.201, which was associated with 249 degrees of freedom. The value of r_{Sp} was tested (through t-test) to be statistically highly significant (at 1 percent probability level; p-value = 0.0013). This implied that in respect of males, the association between academic achievement and the academic confidence was positive (i.e., direct) and highly significant.

In other words, with an increase in the value of the first dimension of academic resilience among males, there was a tendency for academic achievement to increase, and vice versa. For the males, each of the remaining four dimensions of academic resilience (viz. sense of well-being, motivation and ability to get goals relationship with peers and adults, emotional regulation and physical health) as well as the aggregated score of academic resilience were also observed to be directly and highly significantly associated with academic achievement. For females as well, all the five dimensions (as also the aggregated score) of academic resilience were seen to be directly and significantly associated (though at varying levels) with academic achievement. And, similarly, for all the students taken together, all the five dimensions (as also the aggregated score) of academic resilience were observed to be directly and highly significantly associated (at 0.1 per cent probability level) with academic achievement. In a nut-shell, it can be concluded (through the Spearman's correlation analysis) that there existed a strong tendency of academic achievement, on one hand, and each of the five dimensions (as well as the sum total of the score of the five dimensions) of academic resilience, on the other, to move hand-in-hand. It may, however, be remarked that significant associations may not be taken to imply that all the dimensions of academic resilience would necessarily turn out to be important predictors of academic achievement.

R.Q.03: Can academic achievement be predicted by any dimension of academic resilience?

Dependence of academic achievement upon the five different dimensions of academic resilience was studied. The primary objective was to examine if academic achievement of the students could indeed be predicted on the basis of some of these dimensions. For this purpose, multiple linear regression analysis was applied wherein, academic achievement was taken as the dependent (or the explained) variable, and the five dimensions of academic resilience as independent (or the explanatory) variables. The analysis was carried out (through least-squares technique) separately for males, females and then for all the adolescent students taken together.

Regression Analysis for Males

For male students, computations in respect of Stage 1 of the regression analysis is presented in Table 3.

Table 3: Multiple Linear Regression Analysis of Academic Achievement on all the Dimensions of Academic Resilience—Males

Explanatory Variable	$\hat{\beta}$	SE($\hat{\beta}$)	t-value	p-value	Significance
Intercept	56.7828	3.3255	17.075	< 0.001	***
Academic confidence	0.0278	0.0984	0.283	0.7774	NS
Sense of well-being	–0.0177	0.0723	0.245	0.8069	NS
Motivation and ability to get goals	0.1859	0.0802	2.319	0.0212	*
Relationship with peers and adults	0.0906	0.0721	1.257	0.2099	NS
Emotional regulation and physical health	0.1155	0.0566	2.041	0.0423	*

R^2 = 0.1075; = 0.0893; F for R^2 (at 5 and 245 d.f.) = 5.903***; p < 0.0001

Main Implications from Table 3

Computed value of the coefficient of multiple determination (R^2) for the multiple linear regression equation was 0.1075, which implied that of the total variation in the dependent variable, i.e., academic achievement is merely 10.75 per cent of the variation was attributable jointly to the five independent variables (viz., different dimensions of academic resilience). Rest of the variation (nearly 89.25 per cent) in academic achievement was found to be occurring due to other unknown forces. Value of the adjusted (for number of degrees of freedom) coefficient of multiple determination (R^2) was still lower at 0.0893. F-value for R^2 (at 5 degrees of freedom for numerator and 245 for denominator) was computed to be 5.903, which was tested to be statistically highly significant, because the associated value of p was exceedingly small (<0.0001). Equivalently, the computed value of R^2 was highly significant. This could be taken to imply that the five independent variables taken together were capable of predicting the dependent variable quite precisely.

In the estimated equation, only two of the dimensions (viz., motivation and ability to get goals and emotional regulation and physical health) were, however, observed to be statistically significant (each at 5 per cent probability level), while the other three were non-significant (so far as their effect on academic achievement was concerned). Intercept term was observed to be highly significant (at 0.1 per cent probability level), which implied that when each of the five

explanatory variables assumed a value of zero, then the expected value of academic achievement (=56.78) was highly significantly more than zero.

Next, in Stage 2, an attempt was made to explore the possibility of simplifying the regression model (without incurring any major loss in the information provided) through the step-wise regression analysis. Results in respect of such an equation are reported in Table 4 below:

Table 4: Results on Step-wise Multiple Linear Regression Analysis of Academic Achievement on Different Dimensions of Academic Resilience—Males

Explanatory Variable	$\hat{\beta}$	SE($\hat{\beta}$)	t-value	p-value	Significance
Intercept	57.0362	3.0539	18.676	< 0.001	***
Motivation and ability to get goals	0.1846	0.0720	2.563	0.0110	*
Relationship with peers and adults	0.0916	0.0689	1.330	0.1848	NS
Emotional regulation and physical health	0.1142	0.0555	2.058	0.0407	*

R^2 = 0.1071; R^2 = 0.0962; F for R^2 (at 3 and 247 d.f.) = 9.874***; p < 0.0001

A glance at Table 4 reveals that the first two dimensions (viz., academic confidence and well-being) of academic resilience got filtered out from the regression equation. Thus, the most appropriate combination of the explanatory variables for the purpose of predicting academic achievement of males were last three dimensions of the academic resilience as mentioned in the table. Out of these three dimensions, motivation to get goals and emotional regulation and physical health were tested to be statistically significant (each at 5 per cent probability level), whereas relationship with peers and adults was non-significant. Although non-significant, yet it was supposed not to leave out these dimensions, otherwise there would be perceptible reduction in the predictive power of the equation. In the simplified equation n the value of R^2 has marginally come down (from 0.1075 to 0.1071). However, the value of R^2 has improved from 0.0893 to 0.0962.

The value for R^2 was observed to be statistically highly significant (at 0.1 per cent level), because its p-value was exceedingly small (< 0.0001). Thus, among males, three of the dimensions taken together were capable of predicting the score on academic achievement in a highly significant manner.

Regression Analysis for Females

Table 5: Multiple Linear Regression Analysis of Academic Achievement on all the Dimensions of Academic Resilience—Females

Explanatory Variable	$\hat{\beta}$	SE($\hat{\beta}$)	t-value	p-value	Significance
Intercept	60.6098	3.1150	19.457	< 0.001	***
Academic confidence	0.1152	0.0893	1.290	0.1984	NS
Sense of well-being	-0.0317	0.0687	0.462	0.6445	NS
Motivation and ability to get goals	0.1075	0.0752	1.430	0.1541	NS
Relationship with peers and adults	0.0410	0.0727	0.563	0.5737	NS
Emotional regulation and physical health	0.1024	0.0600	1.707	0.0892	NS

R^2= 0.0772; R^2 = 0.0574; F for R^2 (at 5 and 233 d.f.) = 3.897**; p = 0.0021

Here, in case of females, computed value of the coefficient of multiple determination (R^2) for the multiple linear regression equation was 0.0772, which implied that of the total variation in the dependent variable Academic Achievement, merely 07.72 per cent of the variation was attributable jointly to the five independent variables (viz., different dimensions of academic resilience). Rest of the variation (nearly 92.28 per cent) in ACAC was found to be occurring due to other unknown forces. F-value for R^2 (at 5 degrees of freedom for numerator and 245 for denominator) was computed to be 3.897, which was tested to be statistically highly significant, because the associated value of p was exceedingly small (< 0.0001).

In the estimated equation, no dimension was however observed to be statistically significant (each at 5 per cent probability level), in next stage again, step wise regression analysis was applied. Results in respect of such an equation are reported in Table 6 below:

Table 6: Results on Step-wise Multiple Linear Regression Analysis of Academic Achievement on Different Dimensions of Academic Resilience—Females

Explanatory Variable	$\hat{\beta}$	SE($\hat{\beta}$)	t-value	p-value	Significance
Intercept	60.9081	3.0024	20.287	< 0.001	***
Academic confidence	0.1160	0.0834	1.392	0.1652	NS

Motivation and ability to get goals	0.1064	0.0684	1.555	0.1213	NS
Emotional regulation and physical health	0.1049	0.0565	1.855	0.0649	NS

R^2= 0.0750; R^2 = 0.0632; F for R^2 (at 3 and 235 d.f.) = 6.354***; p = 0.0004

Dimension number 2 and 4 were filtered out from the regression analysis. All the remaining dimensions as described in Table 6 were resulted to be non-significant. So the findings revealed that none of the dimensions taken together were capable of predicting the scores on academic achievement in highly significant manner.

Regression Analysis for all Students

Findings of Table 7 revealed that computed values of the coefficient of multiple determination (R^2) for the multiple linear equation was 0.0908 which is merely 09.08 per cent of the variation and was jointly attributable to five independent variables. F value for R^2 (at 5 and 484 d.f.) was 9.672, which was tested to be statistically highly significant. In this equation, only two dimensions, i.e., motivation and ability to get goals and emotional regulation and physical health found to be significant while the other three were non–significant. In next stage step wise regression analysis was applied and dimension 1 and 2 were excluded. Results in respect of such an equation are reported in Table 8 below:

Table 7: Multiple Linear Regression Analysis of Academic Achievement on all the Dimensions of Academic Resilience—All Students

Explanatory Variable	$\hat{\beta}$	SE($\hat{\beta}$)	t-value	p-value	Significance
Intercept	58.6098	2.2701	25.819	0	***
Academic confidence	0.0735	0.0661	1.111	0.2670	NS
Sense of well-being	-0.0218	0.0496	0.441	0.6595	NS
Motivation and ability to get goals	0.1430	0.0546	2.619	0.0091	**
Relationship with peers and adults	0.0716	0.0507	1.412	0.1585	NS
Emotional regulation and physical health	0.1059	0.0408	2.597	0.0097	**

R^2 = 0.0908; R^2 = 0.0814; F for R^2 (at 5 and 484 d.f.) = 9.672**; p < 0.0001

Table 8: Results on Step-wise Multiple Linear Regression Analysis of Academic Achievement on Different Dimensions of Academic Resilience—All Students

Explanatory Variable	$\hat{\beta}$	SE($\hat{\beta}$)	t-value	p-value	Significance
Intercept	58.5366	2.2621	25.877	< 0.001	***
Academic confidence	0.0671	0.0645	1.041	0.2984	NS
Motivation and ability to get goals	0.1349	0.0514	2.625	0.0089	**
Relationship with peers and adults	0.0697	0.0505	1.380	0.1681	NS
Emotional regulation and physical health	0.1026	0.0401	2.562	0.0107	*

R^2 = 0.0905; R^2 = 0.0830; F for R^2 (at 4 and 485 d.f.) = 12.062***; p < 0.0001

As per the calculations depicted in Table 8 it was observed that two dimensions of academic resilience, i.e., motivation and ability to get goals and emotional regulations and physical health were found to be significant whereas dimension first and fourth found to be non-significant but it was supposed not to leave out first and fourth dimension, otherwise there will be perceptible reduction in the predictive power of the equation. In the simplified equation, the computed value of R^2 has deceased marginally from 0.0908 to 0.0905 and the value of R^{-2} has improved from 0.0814 to 0.0830. The value of R^2 is statistically observed as highly significant, so from the findings, it can be concluded that the four dimensions of academic resilience viz. academic confidence, sense of well-being, motivation and ability to get goals, relationship with peers and adults and emotional regulation and physical helth are capable of predicting the academic achievement of all the students in a significant manner.

Discussions

As the results revealed that all dimensions of academic resilience viz. academic confidence, motivation and ability to get goals, relationship with peers and adults, emotional regulation and physical health except the dimension of sense of well-being can predict the academic achievement and gender variation exists as in case of male students three dimensions, i.e., relationship with peers and adults, sense of well-being, emotional regulation and physical health are predictor of the academic achievement but in case of female students no

dimension seems to be predictor of the academic resilience.

As far as relationship with peers and academic achievement is concerned, research studies showed that there exists a relationship between these two variables. The findings were in line with other previous findings by Foster (2006), Nicole (2004), Ide, et al. (1981) and Bankole and Ogunsakin (2015), Uzezi and Deya (2017) whose findings also revealed that peers relationship influence academic performance of secondary school students. Studies associated with motivation and ability to get goals show the relationship of these with academic achievement (Bouffard et.al, 1995; Sideridis, 2005 and Roebken, 2007). Although sufficient literature is not found in case of academic confidence and academic achievement, but still, it can be said that that the confidence in academics had direct relation with academic achievement and it can predict the academic success of an individual. In case of motivation, many studies support that motivation can predict academic achievement of students. (Ali and Mcinerney, 2009; Ghafor, 2004). Additionally, studies on academic resilience are predominantly focused on the mental health and well-being of the learner and not in terms of academic development (Leysa and Malnegaro, 2016). So, various dimensions of academic resilience are the predictor of academic achievement.

Recommendations

For the further research, it is recommended that while calculating the prediction of academic achievement only gender variation was in focus but other demographic variables like type of family, working status of mother, socio-economic status of the students, locale, etc., can also be taken into consideration. However relation of academic achievement and academic resilience can also be ascertained. Although various studies have already been conducted on these two variables, still there is scope that this type of study can be conducted on a larger number of a sample. The answer of the question that why in case of females no dimension of the academic resilience found to be the predictor of the academic achievement can also be ascertained in the further research. Longitudinal studies in the field of academic resilience can also be conducted. Present study was of quantitative nature, moreover initiative of qualitative studies can also be taken in case of academic resilience and achievement. Most of studies on academic resilience established its links to different domains that range from academic and educational constructs to psychological factors, socio-demographic as well as family and peer-group characteristics.

Conclusion

Academic resilience is a tool that can help the students to pass through the tough academic situations and can also predict the academic excellence of the students. Recent innovations and trends in education have focused upon the resilience building among the students. Moreover, the National Education Policy, 2020 has recommended more skill based and experiential learning structure for school education which will ultimately lead to more academically resilient young generation. Further, with due impact of the policy, the restructuring of the school and higher education system in India will not merely be relied on the dominance of the examination system for the academic enrichment of the students. In the present study, it was found that various dimensions of academic resilience are predictor of academic achievement however, gender variation also exists. On the basis of the findings of the study, it can be concluded that in the classroom, innovative teaching methodologies should be used that not only focus upon the academic enrichment, concept formulation and understanding but also focus on the development of resilience among the students. More they are academically resilient; more effective will be their learning outcomes. Teachers should opt the strategies as recommended by the various commissions and committees and should make efforts to implement those recommendations. Recent suggestions recommends on the life skills based learning strategies that not only inculcate values and develop skills among the students but are also focused on the completion of the academic content in an effective way with the help of certain activities and strategies.

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