



LEARNING APPROACHES REGULATES THE ACADEMIC ACHIEVEMENTS OF ADOLESCENTS

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Abstract: The present study was undertaken to investigate the relationship between learning approaches and academic achievement among adolescents in Karnal city of Haryana state in India. The sample of this study consisted of 611 adolescents (281 boys and 330 girls) of 9th and 10th standards, categorized as adolescents. Learning approaches (deep and surface) were measured through Study Process Questionnaire (SPQ-short version) and academic achievement was assessed from marks obtained in the last passed class by the adolescents, taken from school records. The analysis of the obtained responses was done through the One-Way-Analysis of variance and ‘t’ test for ascertaining the significance for cause and effect relationship between and within the achiever groups. The findings indicated that both the learning approaches (deep and surface) showed significant difference with regard to three academic achievement groups (high, average and low) formed with the help of formulae as Mean+1Standard Deviation, taking academic achievements as an independent variable. The high achiever group showed the highest inclination towards deep approach to learning than average and low achiever groups among adolescents Surface approach by adolescents had shown an inverse relationship with their academic achievements. The majority of adolescents fall in the average achiever group from the sampled population. Therefore, the study recommends that average achievers can be motivated by a deep approach to learning for better outcomes in their studies with more career opportunities.

Index Terms- Learning approaches, academic, adolescents, variance, high, average, low

INTRODUCTION

Education is highly acknowledged as the most essential factor for development of human potentialities. Around the globe, every country gives heightened inputs to their education system. Through this, all types of challenges can easily be faced. Education is a process aimed towards the overall development of an individual, in terms of cognitive, affective and psychomotor domains. In other words without education, man is as though in a closed room and with education he finds himself in a room with all its windows open towards outside world (Khan¹). Besides this, education has a pivotal role to play in the economic and social development of any nation. Bearing in mind the importance of education, proselytizing the academic achievement of students, who form the concrete foundation for the country’s progress, is a compelling and critical necessity. Students' performance is the buzzword for today’s educators, academicians and policy planners. Numerous studies have been executed how to improve the academic achievements through the usages of different, upgraded and beneficial methods. All such studies boil down to stating the role of specific variables namely hard work, discipline, parents’ education, family income and self-motivation. Academic performance has taken the centre stage in the field of educational psychology during the recent past in which different cognitive, motivational and contextual variables have been used as predictors. Academic achievement is defined as the performance of the students in

the subject they study in the school (**Pandey**²). It is directly linked to students' growth and development of knowledge in an educational situation where teaching and learning process takes place. Educators have long realized that learning approaches and self-esteem plays a critical role in the field of education. Learning approach refers to the way students tackles the task. Learning approaches enables the students to develop a variety of skills that will help them to become better learners. The concept of learning approach was proposed in late 1970s' (**Marton and Säljö**³) and it became the foundation for 'Student Approaches to Learning' (SAL) theory (**Biggs et.al**⁴). The foundation for all acquired responses presupposes on the part of the learner; a stock of innate dispositions and instinctive tendencies. 'Learning' is relatively the permanent change in a persons' knowledge or behaviour due to experience. With the advancement in the theory, two types of approaches i.e. deep and surface were recognized and widely accepted. Surface approach is in relation of rote-learning, text memorization and reproduces in the same way. While, the deep approach based on the conceptual understanding about the text with meaning and significance. Both approaches are apparent across all the learning tasks imbedded as fairly regular learning behaviours of learners (**Entwistle and McCune**⁵). Besides these two fundamental concepts of learning approaches, students could also have the wish to get the highest grades adopting strategic and/or achieving approach to their studies. Strategic approach can be built-in any of deep or surface approach as per the situation in demand of the context (**Gijbels et.al**⁶).

Academic achievement in adolescents' period can be a stepping stone for the forthcoming year of an individual because of heightened sensitivity for rapid learning and of critical acquisitions. Adolescence is the transitional phase following the outset of puberty through which child develops into an adult. During this period many developments, changes take place in an individual; the way he thinks, communicates and behaves. The choice of career is one of the most crucial decisions an adolescent makes in his life and mostly depends on their academic achievements of the schools. Adolescents with high academic achievement are considered to achieve their identity in the society, get good career opportunities, get acceptance from peer, parents and teachers, develop leadership qualities and enhance their self confidence and self-esteem. Whereas, academic failure leads to frustration, stress, inferiority complex, rejection from loved ones, increased number of suicides, discouragement and ultimately to dropping out (**Ekstrom et.al**⁷, **Steinberg et.al**⁸; **Gadwa and Griggs**⁹). Hence, there is need to give due attention to the factors which are directly or indirectly influencing the academic achievement. There are several other factors like home environment, parental relations, parent's education, occupation, students self-concept, etc. which have a close relationship with academic achievement.

Academic achievement, a measure of success of students is not only affecting the education venture but also the later life in professional competence. With the background of the available information, it has been observed that researchers have not attained yet, a reasonable degree of success in identifying the causal relationship and strength of interactions between learning approaches with the overall influence on academic achievements of adolescents. It further entails that there is non-availability of the true to type information about the effect of deep and surface approaches of learning on academic achievement in reference to the adolescents.

Bearing in mind the importance of education, there is need to work-out the effect of learning approaches on academic achievements among adolescents, who form the concrete foundation for the country's progress. The present study entails the identification of the inputs in the form of independent variables (learning approaches) to increase the academic performance with special reference to adolescents. The outcome of the study would be useful in formulating the programs to improve students' performance in any education field to make them more competitive, successful and better at expression their views about various problems of life. Therefore, the present paper was conceived with objective to examine the effect of learning approaches on academic achievements of adolescents. It was planned to explore the relationship of learning approaches for academic achievement among adolescents in an uncontrolled environment. For the execution of the investigation, nothing has been done to manipulate the variables and exercised the rigorous control over certain variables to examine the effect of independent variables on identified dependent variables during the course of study. Thus, the study was executed on descriptive mode and two hypotheses were constructed for the investigation, as (1) adolescents with high, average and low academic achievements will show significant differences in relation to deep approach of learning (**DAL**), (2) adolescents with high, average and low academic achievements will show significant differences in relation to surface approach of learning (**SAL**).

RESEARCH METHODOLOGY

Population and sample

In the present study, adolescents studying in 9th and 10th standards in the selected schools were comprised the population. A 'sample' is a portion of population which is selected for the purpose of study. The underlying logic of the sampling is that an observation made on cross-section of a population may be extended to the whole population without any loss of holistic representation. A good sample is marked by three basic characteristics namely objectivity, representativeness and adequacy. The details of the location of surveyed schools and sample structure are presented in fig. 1.0 and 2.0. Karnal city (administrative district headquarter) is one of the 22 districts of Haryana state constitutes the National Capital Region (NCR) of India was selected for the study. Eight schools namely Delhi Public School, St. Theresa Covent Public School, Dyal Public School, Partap Public School, DAV School, Millennium Public School, Sant Nikamal Public School and Guru Teg Bahadur Public School operational in municipality area of the Karnal city, Haryana were selected purposively for the generation of data. The total sample of this study was 611 adolescents, comprising of 330 female and 281 male from the schools affiliated to CBSE and ICSE boards in Karnal city of Haryana drawn by random cluster method of sampling since pure random sampling was not possible. Girls were outnumbered than boys in giving the responses among all the selected schools. The maximum number of students who gave their responses was from Delhi Public School and minimum were in Guru Teg Bahadur Public School. Data were collected by administering Study Process Questionnaire (SPQ short version). The responses were collected by administering the tools through online survey SPQ link. However, prior to sending the survey link to the target group, schools were visited and permission was taken from the school authorities. Only after establishing the rapport with school authorities and the target groups, they were asked to give the responses to the statements through web link.

Tools used

In setting up stage of the investigation, investigator weighs the merits of different available tools for research methodologies in context of the objectives of the study and chooses the best one after ascertaining the test-retest reliabilities on the adolescents selected from the target population. Revised-SPQ-2 factor (2001) was used in the present study. It measures deep and surface approaches of learning, comprising of 10 items in each. It is possible to distinguish between strategy and motivation sub-scales within each of these 2 factors. Each of the sub-scales comprised of 5 items. The final version of the questionnaire made more robust and effective compared to the original SPQ. The original Cronbachs' alpha values for reliability of the four sub-scales are given in table 1.0.

The attempt was made to determine the reliability of two study approaches i.e. deep and surface by test and re-test method. The SPQ was administered twice on a sample of 75 adolescents within the interval of 10 days. The obtained values of coefficient of correlation for scales and sub-scales of SPQ indicating test-retest reliability and given in table 2.0. SPQ version 2 was quite suitable to use in the present study because of its short nature and simple in scoring of the responses. On completion of the tools, scoring was done with the help of hand scoring keys prepared by the developers.

Table 1.0 Cronbachs' alpha values of four sub-scales in SPQ

S. No.	Sub-scales	Cronbachs' alpha values	Mean
1.	Deep motive	0.62	2.71
2.	Deep strategy	0.63	2.79
3.	Surface motive	0.72	4.31

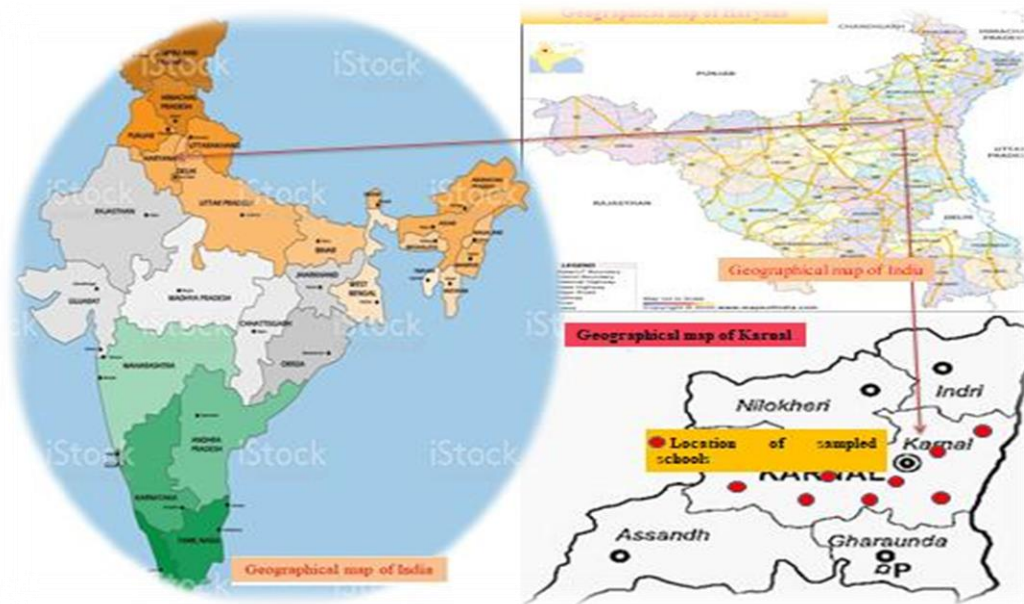
4.	Surface strategy	0.57	3.77
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Table 2.0 Test-retest reliability of SPQ in Indian conditions

S. No.	Sub-scales	Coefficient of correlation (r)
1.	Deep motive	0.64
2.	Deep strategy	0.68
3.	Surface motive	0.75
4.	Surface strategy	0.66

(N=75 and interval period of 10 days)

As the values of coefficient of correlation were highly significant that’s why this tool can be effectively used in Indian conditions. It is quite user friendly because of its short nature and simplicity in assigning scores to the statements. A copy of the SPQ is given in **Appendix 1**.



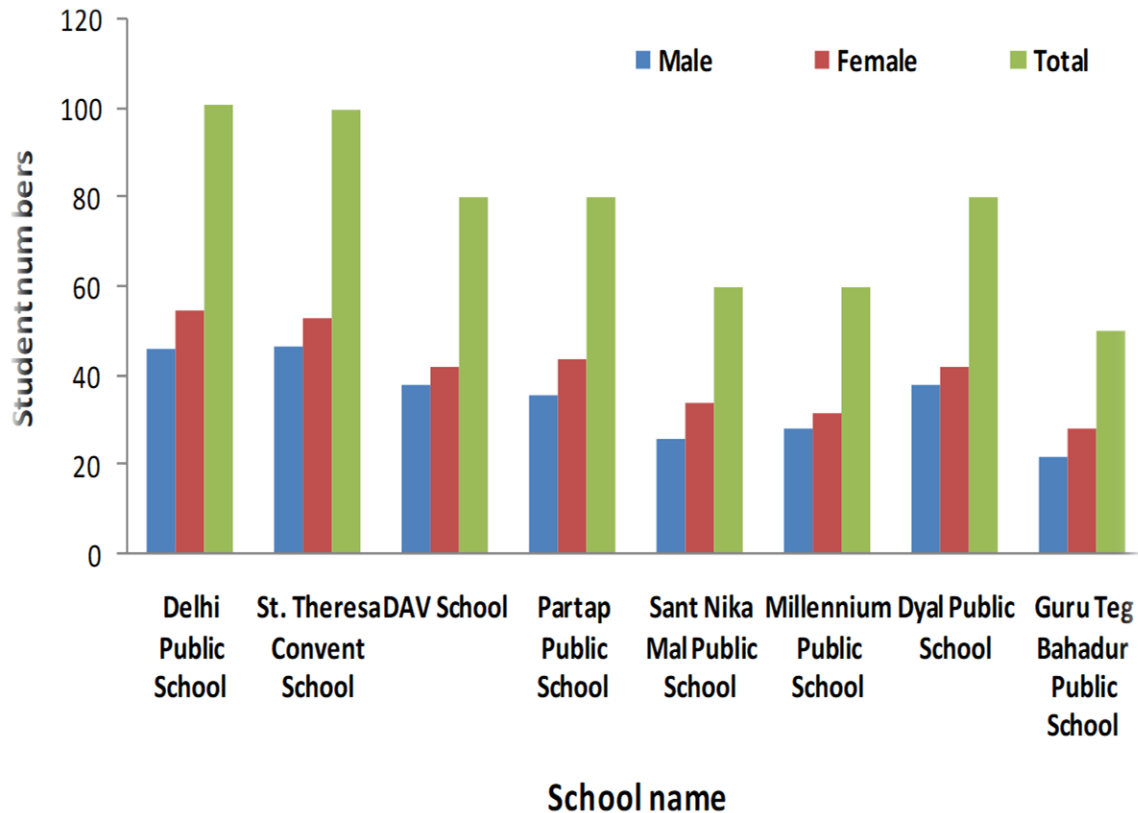


Fig. 1.0 Geographical locations of study area with population size

Group formation of adolescents

Academic achievement and learning approaches were the variables on which adolescents were classified into three groups. The students were classified in three groups based on academic achievements viz. high, average and low achiever adolescents based on their academic grades of the previous passed class, herein the present investigation referred to 9th and 10th standard. An $M \pm 1SD$ formula was used for grouping the adolescents by taking academic achievements an independent variable. Adolescents scored $M+1SD$ or above were taken as high achievers. Adolescents scored $M-1SD$ or below were grouped as low achievers. Rest of them in between high and low were grouped in average achiever category.

Statistical analysis of data

Statistical analysis was done by F-test for two sample variances (ANOVA) and simple 't' test. Mean and standard deviation (S.D.) were calculated for finding out the 't' values to test the significance of the obtained data. The details of the tools used for data analysis is give here as under:

Arithmetic mean

Arithmetic mean was obtained by adding all the scores and dividing their total by number of observations taken.

$$\bar{X} = \frac{\sum X_i}{N}$$

Where,

\bar{X} = Arithmetic mean, X_i = Scores obtained, N = Number of items

Standard Deviation (S.D.)

Standard deviation is the most widely used measure of dispersion of a series. It is defined as the square root of arithmetic mean of the squares of deviations of individual observations from their arithmetic mean. It was worked out by the following formula:

$$S.D. = \sqrt{\frac{\sum (X - \bar{X})^2}{N}}$$

Where,

S.D. = Standard Deviation, X = Individual observations, \bar{X} = Mean of X values
 N = Number of items

One-Way-Analysis of Variance (ANOVA)

One-Way-Analysis of Variance was used to analyse the difference in mean scores criterion variables. For determining the significance among the means of two or more than two groups, single classification analysis of variance generally referred as ANOVA is to be employed. The analysis of variance is a more general form of 't' test that in fact, may be employed with only two groups. The general rationale of the ANOVA is that the total variance of all subjects in an experiment can be analysed into two sources, variance between groups and within groups.

't' test

The index used to find out the significance of difference between the means of the two samples called 't' test. 't' ratio formula is as given here as under:

$$t = \frac{\bar{X}_1 - \bar{X}_2}{S \sqrt{\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}}$$

$$S = \sqrt{\frac{\sum_{i=1}^{n_1} (X_i - \bar{X}_1)^2 + \sum_{j=1}^{n_2} (X_j - \bar{X}_2)^2}{n_1 + n_2 - 2}}$$

Where,

\bar{X}_1 = Mean score of group 1, \bar{X}_2 = Mean score of group 2, n_1 = Number of subjects in group 1, n_2 = Number of subjects in group 2, t = Value of t statistical, $n_1 + n_2 - 2$ = Degree of freedom

The values of the various statistical tests used to check the level of significance, were compared with the critical values given in the statistical tests. Levels 0.05 and 0.01 being used to evaluate the significance of the obtained results. If calculated value is more than table value, it shows that there is significant difference in means/percentages and the null hypothesis considered to be rejected.

RESULTS AND DISCUSSION

The present study aimed at to see the effect of learning approaches i.e. deep and surface on academic achievements among adolescents enrolled in schools under jurisdiction of Karnal city in Haryana state. The relevant data were generated with the help of suitable tools on a sample of adolescents studying in 9th and 10th standard under the jurisdiction of Karnal municipality area in Haryana state of India. Deep and surface approaches were taken as dependent variable on academic achievements of adolescents which was considered as independent variable for the study.

Deep approach of learning and academic achievement among adolescents

The results obtained through ANOVA with regard to deep approach of learning between and within the groups of adolescents (high, average and low achievers) have been given in table 3.0. Analysis of variance for mean scores of deep approach in respect of three academic achievement groups of adolescents showed the significance at 0.01 per cent level at dfs 2 (between group) and 608 (within the group). The Mean Sum of Squares (MSS) between the groups is 44.1 and within the group is 0.71, showing the higher variation between the groups than within the group of adolescents. This led to the inference that high, average and low achieving academic groups of adolescents had significant difference in the mean scores of deep approach of learning adopted by the adolescents. Hence, the proposed research hypothesis no. (1) affirming that '*Adolescents with high, average and low academic achievements will show significant differences in relation to deep approach of*

learning (*DAL*)' was confirmed and accepted. It was further observed that on an average all the three achievement groups of adolescents were adopted significantly different deep approach of learning while compared between and within the groups. Deep approach of learning had significant association with the academic achievement of adolescents. From this, it may be interpreted that academic achievement had a significant influence on deep approach of learning adopted by the adolescents.

Table 3.0 Summary of analysis of variance for scores of deep approach in respect of three academic achievement groups of adolescents

S. No.	Source of variation	SS	df	MS	F-ratio
1.	SS_B (Between groups)	88.23	2	44.1	61.8**
2.	SS_w (Within groups)	433.8	608	0.71	
3.	SS_T (Total)	522.0	610		

(** Significance at 0.01 level)

Significance in One-Way-Analysis of Variances ratio between the groups and within the group does not reveal the information about which of the groups were positioned higher about the inclination towards deep approach of learning by three academic achievement groups. So, 't' test was carried out to reveal the exact trends within the group and between the groups of academic achievements. The results of the 't' test have been presented in table 4.0 and mean scores of each academic group in fig. 2.0 showing the comparativeness of academic achievement groups for deep approach of learning.

Mean scores of high and average achieving groups on deep approach of learning was significant ($P < 0.01, df = 499, t = 6.37$). This means that significant variation between high and average academic achiever was reported and both the groups showed difference in adopting the deep approach of learning. The second 't' value (10.7) was found to be significant ($P < 0.01, df = 224$) and the mean difference was in favour of high achieving group. The inference for the obtained results was that the high achieving group of adolescents was more persuaded towards deep approach of learning than the low achieving group. Third value is also significant at 0.01 level of significance with 493 degree of freedom, giving t value is 7.64. This 't' value compares the average and low achieving groups. Mean of the average achievement group is higher than the low achieving group. This means that average achieving group has more tended to adopt deep approach of learning than low achieving groups. High and average achieving groups behaved significantly different from each other towards deep approach of learning. However, the high achiever group was significantly different while compared with low achieving groups of adolescents. Mean scores of three academic groups (Fig. 2) clearly show that high achievers emerged as first in adopting the deep approach of learning by giving the highest mean score (3.42) followed by average (2.83) and low achievers (2.17). The differences in deep approach of learning and academic achievement are going hand in hand, positively, which is clearly reflected by their academic achievement. The results are in line with the earlier findings by **Watkins and Akande**¹⁰ that there was positive relationship between deep approach and academic achievement. Similarly, **Papinczak et.al**¹¹ also observed that students who followed deep approach of learning are found to focus oriented to their task with key interest and in-depth understanding of the subject. Adolescents who adopted deep approach of learning showed the proclivity towards integration of their own thoughts, individual experience and formal knowledge in their study material for conclusive comprehensive knowledge for achieving higher academic grades (**Ballantine et.al**¹²). Higher use of deep approach of learning (**Tarabashkina**¹³) with general intelligence gave higher academic achievement (**Cano**¹⁴). Higher academic achievers always in use of deep learning approach compared to low achievers (**Zeegers**¹⁵). **Sushma**¹⁶ in his study found that there was significant difference in adoption of deep approach of learning

among B.Ed. students in Himachal Pradesh. She has also observed that science students generally adopt deep approach of learning against their arts counterparts. **Sood**¹⁷ observed that male and female distance learners have similar level of adopting deep and surface approach towards their study. However, in certain cases male superiority has been observed over female with reference to deep approach of learning. The results on deep approach of learning and academic achievement were equally supported by the findings of **Gadgella et.al**¹⁸ wherein they also found that students obtained higher scores with deep processing approach and fact retention style than surface approach of learning among American college students. Therefore, the results are in congruous with the earlier findings that high achievers are generally inclined to deep approach of learning, making them conceptually strong for getting higher marks in the examination compared to low achievers.

Table 4.0 Significance of difference in mean scores of deep approach in respect of three academic achievement groups of adolescents

S. No.	Groups	N	Mean	Compared groups	df	't'
1.	High achiever	116	3.42	1 & 2	499	6.37**
2.	Average achiever	385	2.83	1 & 3	224	10.7**
3.	Low achiever	110	2.17	2 & 3	493	7.64**

(** Significance at 0.01 level)

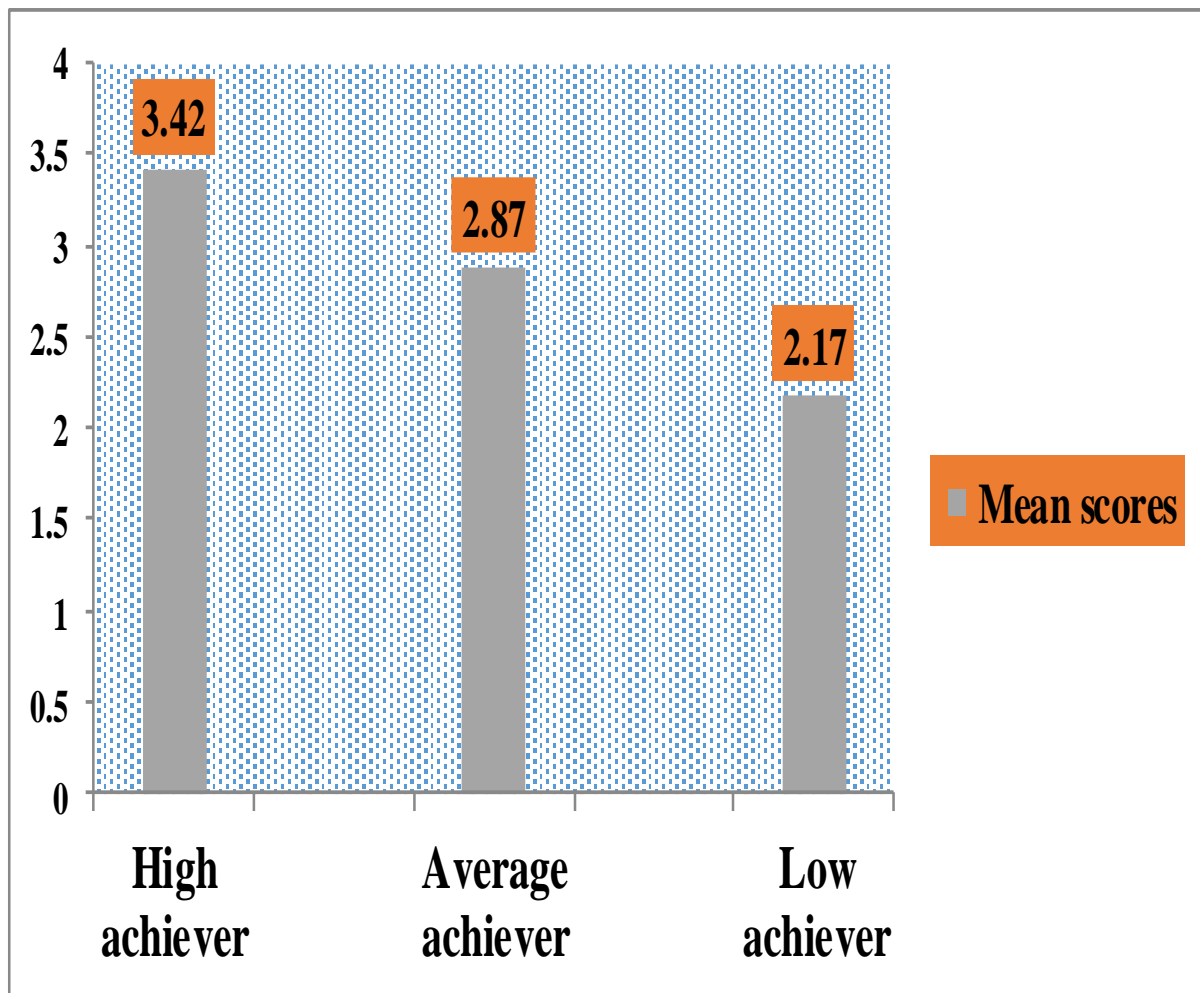


Fig. 2.0 Difference in deep approach of high, average and low academic achievement groups among adolescents

Surface approach of learning and academic achievement among adolescents

A summary of results obtained through One-Way-Analysis of Variance with respect to surface approach to learning have been presented in table 5.0. The F-ratio of 103.5 is significant ($P < 0.01$, dfs 2 and 608) between and within the group of adolescents. It implies that high, average and low academic achiever among adolescents had significant differences in mean scores of surface approach of learning. Therefore, the research hypothesis no. 2 stating that '*Adolescents with high, average and low academic achievements will show significant differences in relation to surface approach of learning (SAL)*' was accepted and confirmed. It can be further interpreted to understand that surface approach by adolescents had significant link with their academic achievements.

't' test was carried out to understand that which achiever group was higher and/or lower towards surface approach of learning. The data presented in table 6.0 and mean scores of each academic group in fig. 3.0. Mean scores of high and average achieving groups on surface approach of learning was significant ($P < 0.01$, df 499 and $t = -8.82$). This leads to the interpretation that the high and average academic achieving group differed in their approach to adopt surface approach of learning by adolescents. The second 't' value (-13.3) was also significant ($P < 0.01$, df 224) and the mean differences was in favour of low achieving group, giving negative 't' value than the high achieving group. This clearly infers that the high and low achiever showed significant varying approach to surface approach of learning among adolescents.

Similarly, the third 't' value (-9.53) was also showed significant difference between average and low achiever groups with respect to surface approach of learning among adolescents. The mean scores of three achiever groups showed that low achiever emerged as leader compared to average and high achieving groups among adolescents in adopting surface approach of learning. The mean score of higher achiever was 4.57 (low achiever) followed by average (3.92) and low achiever (3.23), showing that low achievers showed their more inclination towards surface approach of learning among adolescents. It is clearly evinced from the data that the

relationship between surface approach and academic achievement was inverse. The adolescents adopting surface approach of learning are the low achiever in their academic endeavour. The results are in congruous with the earlier findings well documented in the literature. **Hasnor et.al**¹⁹ reported inverse relationship between surface approach and academic achievement while examining the effect of three learning approaches (deep, surface and strategic) on the academic achievement of students in American students of International Education College, implies that the surface approach lead to low academic achievement. **Drew and Watkins**²⁰ also found that theoretical notion of personality variables have direct influence on students learning processes and their academic achievements. They supported that self-concept enhancement intervention is responsible for overall improvement of different aspects of students' learning. The study suggests that surface approach of learning should be discouraged to have higher academic achievement with conceptual understanding of the subject.

Table 5.0 Summary of analysis of variance for scores of surface approach in respect of three academic achievement groups of adolescents

S. No.	Source of variation	SS	df	MS	F-ratio
1.	SS_B (Between groups)	99.98	2	49.9	103.5**
2.	SS_w (Within groups)	293.5	608	0.48	
3.	SS_T (Total)	393.5	610		

(** Significance at 0.01 level)

Table 6.0 Significance of difference in mean scores of surface approach in respect of three academic achievement groups of adolescents

S. No.	Groups	N	Mean	Compared groups	df	't'
1.	High achiever	116	3.24	1 & 2	499	-8.82**
2.	Average achiever	385	3.92	1 & 3	224	-13.3**
3.	Low achiever	110	4.57	2 & 3	493	-9.53**

(** Significance at 0.01 level)

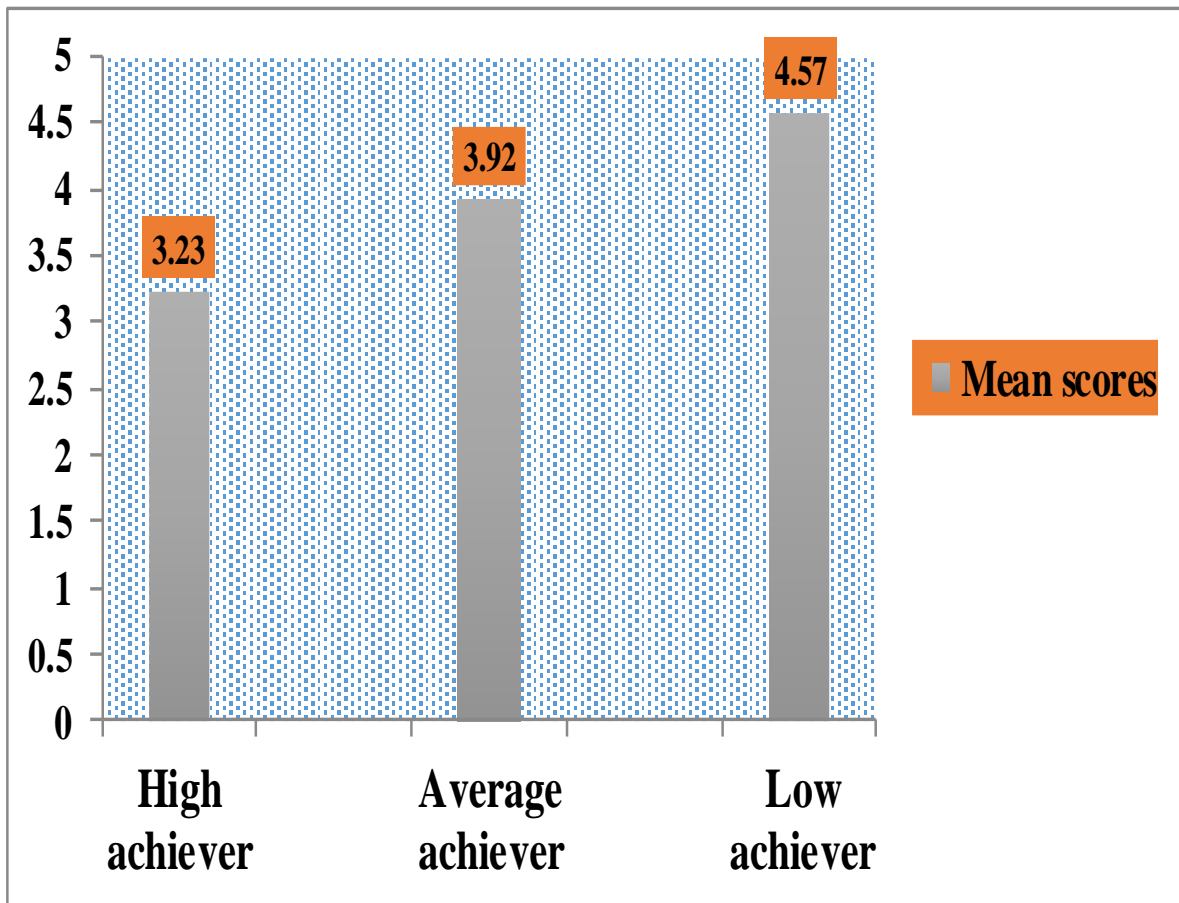


Fig. 3.0 Difference in surface approach of high, average and low academic achievement groups among adolescents

The graphical presentation of the mean scores of high, average and low achiever groups of surface approach of learning clearly favours the inverse relationship between the academic achievements among the adolescents with the surface approach of learning. The findings of **Watkin and Regmi**²¹ equally supported the inferences of the obtained data in present investigation that surface approach of learning has negative association with academic achievement. In the present context, high achievers have been reported to show least inclination towards surface approach of learning among adolescents than that of average and low achievers. The study approaches are greatly moulded by contextual variables, accentuates the type of examination which are in favour of memorization. In addition to this, attention is not given to precarious thinking, thought provoking and fact-finding learning. This could be the reasons that adolescents generally go for cramming the things to get through with the respective examinations of the courses. It appears that such factors are the real casual factors for the obtained results pertaining to surface approach of learning by adolescents with reference to the academic achievements. As regards, the differences in surface approach and academic achievement are concerned; both the variables are going hand in hand but in negative direction.

But, in the present context, high achievers have been reported to show more inclination towards surface approach of learning among adolescents than average and low achievers. The study approaches are greatly moulded by contextual variables, accentuates the type of examination which are in favour of memorization. In addition to this, stress is not given to precarious thinking, thought provoking and fact-finding learning. This could be the reasons that adolescents generally go for cramming the things for getting higher marks in the respective courses. It appears that such factors are the real casual factors for the obtained results pertaining to surface approach of learning by adolescents with reference to the academic achievements in the previous class

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Appendix 1

STUDY PROCESS QUESTIONNAIRE (SPQ)-Learning Approaches

S. No.	Statements	Code nos.				
1.	I find that at times studying gives me a feeling of deep personal satisfaction.	A	B	C	D	E
2.	I find that I have to do enough work on a topic so that I can form my own conclusions before I am satisfied.	A	B	C	D	E
3.	My aim is to pass the course while doing as little work as possible.	A	B	C	D	E
4.	I only study seriously what is given out in class or in the course outlines.	A	B	C	D	E
5.	I feel that virtually any topic can be highly interesting once I get into it.	A	B	C	D	E
6.	I find most new topics interesting and often spend extra time trying to obtain more information about them.	A	B	C	D	E
7.	I do not find my course very interesting so I keep my work to the minimum.	A	B	C	D	E
8.	I learn some things by rote going over and over them until I know them by heart even if I do not understand them.	A	B	C	D	E
9.	I find that studying academic topics can at times be as exciting as a good novel or movie.	A	B	C	D	E
10.	I lost myself on important topics until I understand them completely.	A	B	C	D	E
11.	I find I can get by in most assessments by memorizing key sections rather than trying to understand them.	A	B	C	D	E
12.	I generally restrict my study to what is specifically set as I think it is unnecessary to do anything extra.	A	B	C	D	E
13.	I work hard at my studies because I find the material interesting.	A	B	C	D	E
14.	I spend a lot of my free time finding out more about interesting topics, which have been discussed, in different class.	A	B	C	D	E
15.	I find it is not helpful to study topics in depth. It confuses and wastes time, when all you need is a passing acquaintance with topics.	A	B	C	D	E
16.	I believe that lecturers should not expect students	A	B	C	D	E

	to spend significant amounts of time studying material ever more knows would not be examined.					
17.	I come to most classes with questions in mind that I want answering.	A	B	C	D	E
18.	I make a point of looking at most of the suggested readings that go with lectures.	A	B	C	D	E
19.	I see no point in learning material, which is not likely to be in the examination.	A	B	C	D	E
20.	I find the best way to pass examinations is to by to remember answers to likely questions.	A	B	C	D	E