CHAPTER – IV

ANALYSIS OF RESULTS

The focus of this chapter is to analyze the results of the data obtained by employing all the three tests mentioned in the last chapter.

The chapter titled "Analysis of Results" is the crucible where raw information is transformed into valuable insights. This crucial stage of our research entails a thorough examination of gathered data, which allows us to identify patterns, establish correlations, and derive narratives that hold the key to addressing our research questions.

This chapter is crucial because it bridges the gap between data collection and deriving meaningful conclusions. We intend to discover the underlying meaning and significance of the numbers, words, or observations through a methodical examination. We endeavour to acquire knowledge that will contribute to the corpus of research in this field by employing the appropriate analytic techniques and frameworks.

This phase's significance cannot be exaggerated. It enables us to confirm or disprove our hypotheses, thereby determining the trajectory of our discoveries. In addition, it permits the discovery of unanticipated insights and the development of nuanced interpretations. Our research's credibility and validity will ultimately depend on the calibre and rigour of our analysis.

As we embark on this journey of analysis, we do so with a sense of purpose and a dedication to objective inquiry. Through this rigorous procedure, we are able to unearth the true essence of our research, as well as the stories contained within the data.

This chapter is distributed into five sections for ease of comprehension.

1. The first part deals with normality testing of the data.
2. The second part deals with the verbal working memory.
3. The third, fourth and fifth part is related with variables - Achievement Motivation, Academic Performance and Study Habits.

Furthermore, the third fourth and fifth part is further divided into ten parts in which first three parts are related with mean, standard deviation and category. The fourth sub part is related with 2-way ANOVA in which effects of independent variables [Gender (Boys/Girls)] and Levels of Verbal working memory (Low/Average/High)] on dependent variables is examined.

The fifth part is related with determining the differences of boys and girls on dependent variables. The sixth part is related with determining the effect of verbal working memory on dependent variables. The seventh part is related with comparing study groups on dependent variables. The eighth sub part is related with association of gender and dependent variables. The ninth sub-part is related with association of levels of verbal working memory and dependent variables. The tenth part is related with correlation of verbal working memory scores and dependent variables.

4.1 Normality Testing of Data

For this we will calculate the test statistic (D), which measures the deviation of the sample distribution compared to the normal distribution. The greater the magnitude of D, the more unlikely it will be for data to be normally distributed. The value of "p" measures this likelihood, with a low likelihood suggesting that a sample deviates from a distribution that is normal to an extent that is improbable to have occurred by by chance. Higher D while low p indicate that the data does not have a normal distribution.

Table 4.1.1 shows basic indicators for normality testing with reference to verbal working memory data.

Table 4.1.1 : Basic indicators For Normality Testing with reference to Verbal working memory data

	Verbal working memory
Sample Size (N)	200
Mean	114.49
Median	116
Standard Deviation	9.726403
Skewness	-0.15854
Kurtosis	-0.599604
K-S Test Statistic (D)	0.07986
p value	0.14774

The value of the K-S test statistic (D) is 0.07986 and the p-value is 0.1474. It implies that verbal working memory data is not substantially different from the normally distributed data.

Table 4.1.2 shows basic indicators for normality testing with reference to achievement motivation data.

Table 4.1.2 : Basic indicators For Normality Testing with reference to Achievement Motivation data

	Achievement Motivation
Sample Size (N)	200
Mean	20.04
Median	20
Standard Deviation	4.361596
Skewness	0.098596
Kurtosis	-0.22187
K-S Test Statistic (D)	0.09133
p value	0.06674

The value of D obtained by applying the K-S test statistic came to be 0.09133 and the p-value is 0.06674. It suggests that achievement motivation data does not differ significantly from those with a normal distribution.

Table 4.1.3 shows basic indicators for normality testing with reference to academic performance data.

Table 4.1.3 : Basic indicators For Normality Testing with reference to Academic Performance data

	Academic Performance
Sample Size (N)	200
Mean	75.025
Median	75.5
Standard Deviation	7.246859
Skewness	-0.109535
Kurtosis	-0.81364
K-S Test Statistic (D)	0.08266
p value	0.12293

K-S test statistic (D) has a value of 0.08266, and the p-value is 0.12293. Again, it infers that data on academic performance do not substantially differ from normally distributed data.

Table 4.1.4 shows basic indicators for normality testing with reference to study habit data.

Table 4.1.4 : Basic indicators For Normality Testing with reference to Study Habit data

	Study Habit
Sample Size (N)	200
Mean	72.9
Median	74
Standard Deviation	8.204056
Skewness	-0.045976
Kurtosis	-1.002539
K-S Test Statistic (D)	0.08033
p value	0.14326

K-S test statistic (D) has a value of 0.08033, and the p-value is 0.14326. It implies that study habit data is not substantially different from those with a normal distribution.

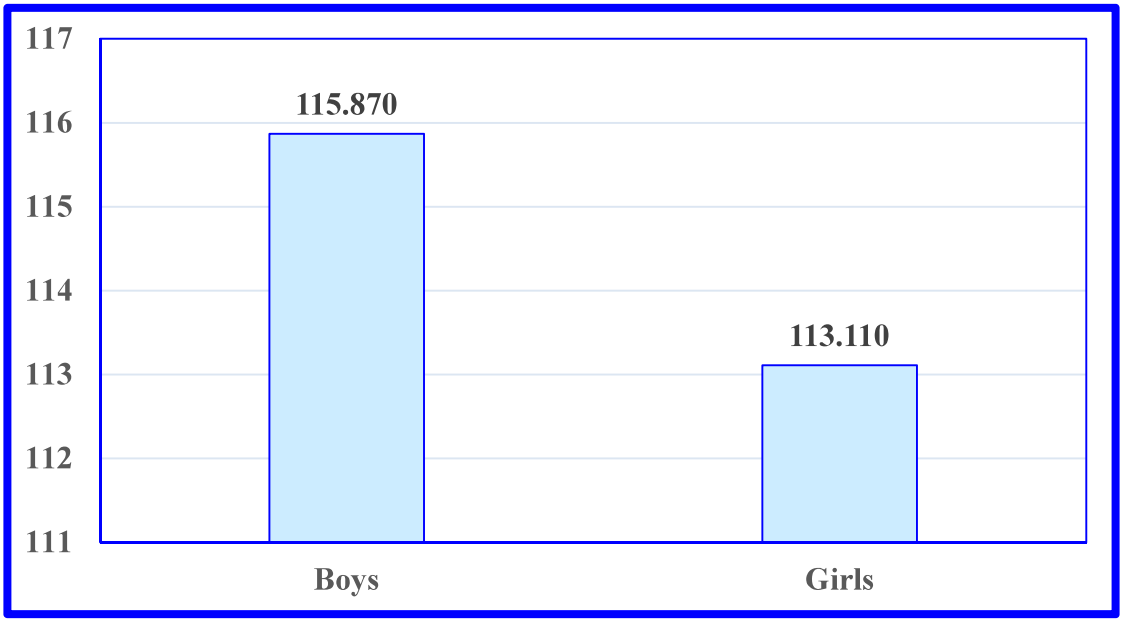
4.2 Verbal working memory

Table 4.2.1 showing mean, standard deviation of selected sample for verbal working memory.

Table 4.2.1: Mean S.D. and Category of Verbal working memory for Boys and Girls

Verbal working memory	N	Mean	S.D.	Category
Total Sample of Boys	100	115.87	9.66	Average
Total Sample of Girls	100	113.11	9.64	Average

Table 4.2.1 shows that mean scores of verbal working memory for boys are 115.87 showing average category of selected sample. Similarly, the girls have a mean verbal working memory score of 113.11 which lies in the average category of selected sample.

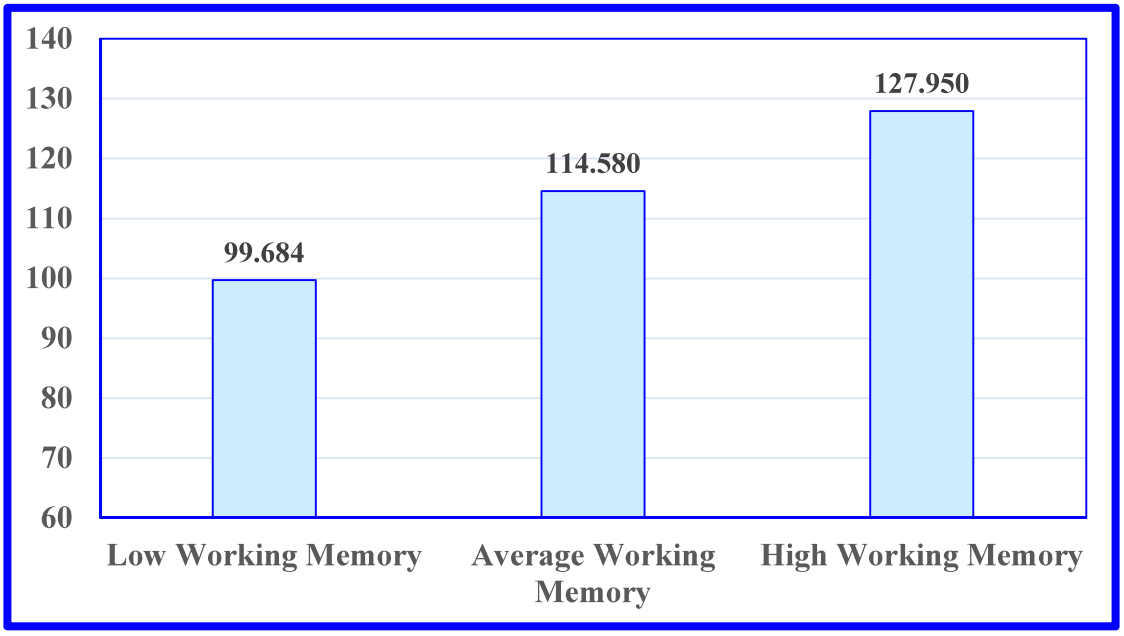


Graph 4A 1 : Mean verbal working memory scores of boys and girls.

Table 4.2.2 : Mean S.D. and Category for different levels of Verbal working memory

Verbal working memory	N	Mean	S.D.	Category
Total Sample with Low Verbal working memory	38	99.68	3.39	Below
Total Sample with Average Verbal working memory	121	114.58	4.36	Average
Total Sample with High Verbal working memory	41	127.95	3.02	High

Table 4.2.2 shows that mean scores of verbal working memory for the sample which is categorized into "low verbal working memory group" is 99.68. Similarly, the sample from "average verbal working memory group" have a mean verbal working memory score of 114.58 which lies in average category of selected sample. In addition, the cohort of people with a "high verbal working memory" has a mean score of 127.95 on the verbal working memory test.



Graph 4A 2 : Mean verbal working memory scores for different levels of verbal working memory

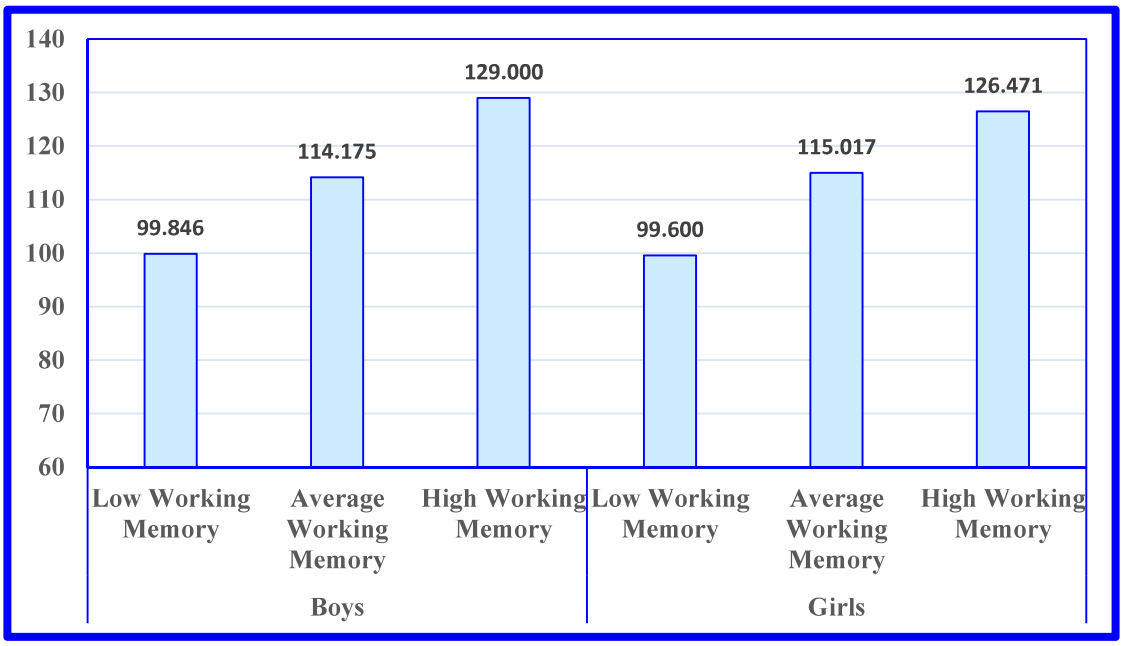
Table 4.2.3: showing mean, S.D. and category of verbal working memory for different study groups.

Table 4.2.3: Mean S.D. and Category of Verbal working memory for Study Groups

Verbal working memory	N	Mean	S.D.	Category
Boys with Low Verbal working memory	13	99.85	2.97	Low
Boys with Average Verbal working memory	63	114.17	4.56	Average
Boys with High Verbal working memory	24	129.00	2.89	High
Girls with Low Verbal working memory	25	99.60	3.65	Low
Girls with Average Verbal working memory	58	115.02	4.11	Average
Girls with High Verbal working memory	17	126.47	2.60	High

Table 4.2.3 tells that the average verbal working memory scores of boys with low verbal working memory category group is 99.85 while the mean verbal working memory scores of boys with average verbal working memory category group is 114.17 and the mean verbal working memory scores of boys with high verbal working memory category group is 129.

Table 4.2.3 also depicts that the mean score of verbal working memory of girls in the low verbal working memory category group is 99.60 while the mean score of verbal working memory of girls in the average category group is 115.02 and the mean score of verbal working memory of girls in the high category group is 126.47.



Graph 4A 3 : Mean verbal working memory scores for study groups

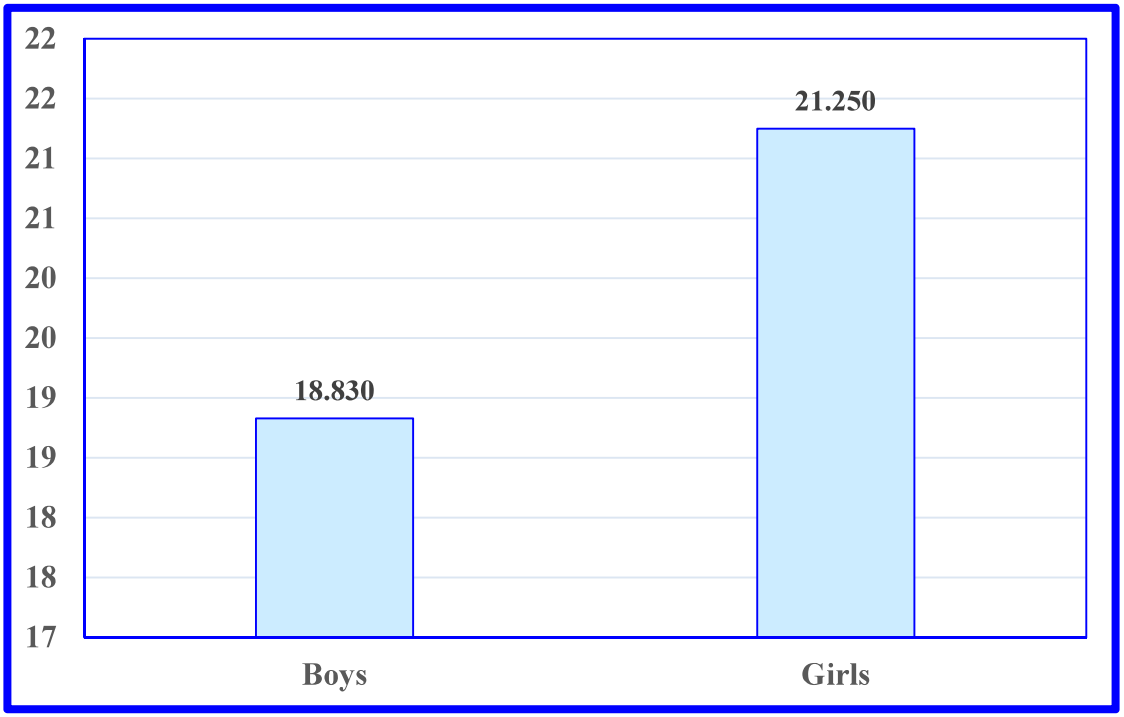
4.3 Achievement Motivation

Table 4.3.1 displays the mean, standard deviation, and achievement motivation category values for both the gender.

Table 4.3.1 : Mean, S.D. and Category of Achievement Motivation for Boys and Girls

Achievement Motivation	N	Mean	S.D.	Category
Total Sample of Boys	100	18.83	4.87	Average
Total Sample of Girls	100	21.25	3.39	Average

Table 4.3.1 shows that mean score of achievement motivation for boys is 18.83 which can be categorized as average level. Similarly, the girls have a mean achievement motivation score of 21.25 which is average level of achievement motivation.

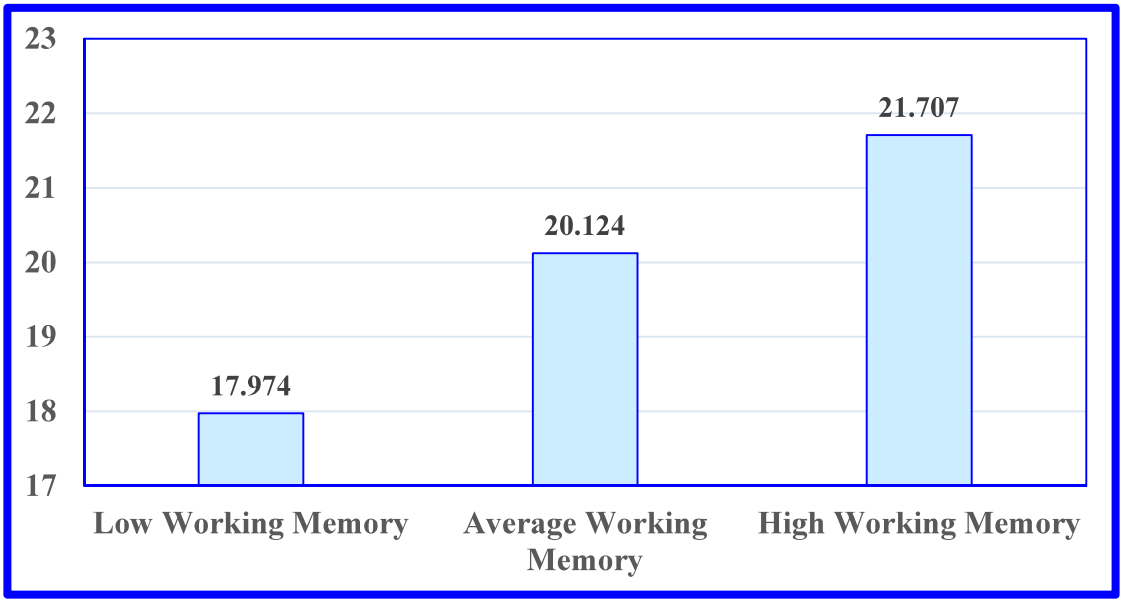


Graph 4B 1 : Mean achievement motivation scores for boys and girls

Table 4.3.2 : Mean, S.D. and Category of Achievement Motivation Scores of students with different levels of Verbal working memory

Achievement Motivation	N	Mean	S.D.	Category
Total Sample with Low Verbal working memory	38	17.97	5.01	Average
Total Sample with Average Verbal working memory	121	20.12	2.79	Average
Total Sample with High Verbal working memory	41	21.71	6.42	Average

Table 4.3.2 shows that mean score of achievement motivation for students from "low verbal working memory group" is 17.97 and which means they are having average level of achievement motivation. Similarly, the average scores of achievement motivation for students from average level verbal working memory group is 20.12 which means that they are having average level of achievement motivation. Furthermore, mean scores of achievement motivation for students from high level verbal working memory group is 21.71, which means that they are having average level of achievement motivation.



Graph 4B 2 : Mean achievement motivation scores for different levels of verbal working memory

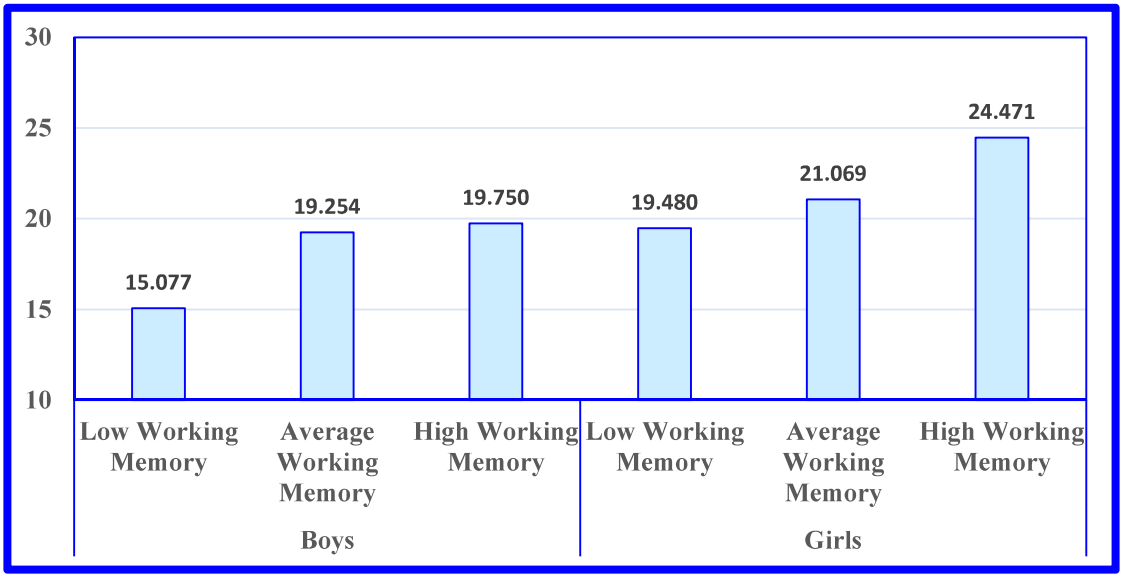
Table 4.3.3 : Mean S.D. and Category of Achievement Motivation Scores for Study Groups

Achievement Motivation	N	Mean	S.D.	Category
Boys with Low Verbal working memory	13	15.08	5.11	Low
Boys with Average Verbal working memory	63	19.25	3.37	Average
Boys with High Verbal working memory	24	19.75	6.99	Average
Girls with Low Verbal working memory	25	19.48	4.33	Average
Girls with Average Verbal working memory	58	21.07	1.50	Average
Girls with High Verbal working memory	17	24.47	4.35	High

Table 4.3.3 shows the mean achievement motivation score of boys with low verbal working memory category group is 15.08 which is categorized as low according to the categorization level of achievement motivation whereas the mean achievement motivation scores of boys with average verbal working memory group is 19.25 and so it is categorized average level of achievement motivation and the mean achievement motivation scores of boys with high verbal working memory category group is 19.75 which is categorized average level of achievement motivation.

Table 4.3.3 also depicts that the mean achievement motivation score of girls with low verbal working memory category group is 19.48 and it is categorized as average level

of achievement motivation while average achievement motivation score of girls with average verbal working memory category group is 21.07 which is categorized as having average level of achievement motivation and average achievement motivation scores of girls with high verbal working memory category group is 24.47 which is categorized as having high level of achievement motivation.



Graph 4.B 3 : Mean achievement motivation scores for study groups

Table 4.3.4 : shows two-way ANOVA for achievement motivation

Table 4.3.4 : Two-way ANOVA for Achievement Motivation

Source	Sum of Squares	df	Mean Square	F-Ratio	Sig.
Type of Gender (A)	477.609	1	477.609	30.665	0.000
Levels of Verbal working memory (B)	433.248	2	216.624	13.908	0.000
A X B	87.791	2	43.895	2.818	0.062
Error	3021.559	194	15.575		
Total	3785.680	199			

Table 4.3.4 reveals that the F-ratio for Gender (Boys/Girls) for achievement motivation is 30.665, which is substantially significant at the 0.01 level ($p=0.000$; $p<0.01$), which infers that boys and girls have significantly different levels of achievement motivation. This may be due to how the society thinks and creates stereotypes. For example, there is always a pressure on the male members of the family to earn and hence their motivation to achieve success in life can be impacted.

Similarly, cultural pressures or thought processes also influence the achievement motivation of boys and girls.

Table 4.3.4 displays that F-ratio for Levels of Verbal working memory (Low/Average/High) for achievement motivation is 13.908 and it is statistically significant at 1% level ($p=0.000$; $p<0.01$), which infers that there are significant differences in achievement motivation levels of students with different levels of verbal working memory. However, **Hyde and Lamon (1990)** discovered no gender differences in achievement motivation or interest in mathematics.

Tables 4.3.4 also reflects that F-ratio for interaction of independent variables (Type of Gender & Levels of verbal working memory) for achievement motivation is 2.818 and it is statistically not significant at 5% level ($p=0.062$; $p>0.05$).

Table 4.3.5 : Comparison of Achievement Motivation of Boys and Girls

	Achievement Motivation	
	Boys	Girls
N	100	100
Mean	18.830	21.250
Std. Deviation	4.878	3.389
Mean Difference	2.420	
't' score	4.074	
p value	0.000	

According to Table 4.3.5, the mean achievement motivation value for boys is 18.830, while the mean achievement motivation value for girls is 21.250. The difference in mean was 2.420, while the 't' score was 4.074, and it is statistically significant at the 1% level ($p=0.000$; $p<0.01$), which suggests that there are significant differences among boys' and girls' achievement motivation. Furthermore, the mean score reflects that girls have higher achievement motivation in comparison to boys. Socially, since girls are confined to restricted environment, it at times naturally comes to them to have higher need to succeed and hence higher motivation to achieve success. Also, learning environment and teaching practices can also affect the achievement motivation among boys and girls. A study by **Bouchey & Harter (2005)**, found that girls had higher academic self-perceptions and showed higher positive reflected

appraisals from teachers and parents when compared to boys. Additionally, girls demonstrated higher achievement motivation specifically in science and math.

Table 4.3.6 : Comparison of Achievement Motivation of students with different levels of Verbal working memory

Achievement Motivation	N	Mean	S.D	Mean Difference	't' score	p value
Low Verbal working memory	38	17.974	5.011	2.150	3.358	0.001
Average Verbal working memory	121	20.124	2.789			
Low Verbal working memory	38	17.974	5.011	3.734	2.867	0.005
High Verbal working memory	41	21.707	6.416			
Average Verbal working memory	121	20.124	2.789	1.583	2.182	0.031
High Verbal working memory	41	21.707	6.416			

Table 4.3.6 shows that average achievement motivation scores for students with low verbal working memory are 17.974 and average achievement motivation scores for students with average verbal working memory are 20.124. The difference in means was 2.150 while 't' score was 3.358 and it is statistically significant at 0.01 level ($p=0.001$; $p<0.01$), which suggests that there are significant differences in achievement motivation of students with low verbal working memory and students with average verbal working memory. Furthermore, mean score reflects that students with average verbal working memory are more motivated to succeed than those with low verbal working memory.

Table 4.3.6 illustrates that average achievement motivation score for students with low verbal working memory is 17.974, while the mean achievement motivation score for students with high verbal working memory is 21.707. The difference in the means was 3.734 and 't' score was 2.867 and it is statistically significant at 1% level

($p=0.005$; $p<0.01$). This means there are substantial differences in achievement motivation between students with low and high verbal working memory. In addition, the mean score indicates that students with high verbal working memory are more motivated to succeed than those with low verbal working memory.

Table 4.3.6 exhibits that the mean achievement motivation scores for students with average verbal working memory are 20.124 and the mean achievement motivation scores for students with high verbal working memory are 21.707. The mean variance was determined as 1.583 while the 't' score was reported as 2.182, which at 5% level of significance is statistically significant ($p=0.031$; $p<0.05$). It suggests that students with ordinary verbal working memory and students with high verbal working memory differ significantly in their motivation to achieve. In addition, the average score indicates that students with high verbal working memory are more motivated to succeed than students with average verbal working memory.

The above results may be because the ability to solve problems, make decisions, and act in a way that is aimed towards achieving goals are all examples of cognitive functions that rely heavily on verbal working memory. Students with a higher verbal working memory capabilities might have access to a larger pool of cognitive resources at their disposal, which may be used for activities associated to accomplishment. This expanded ability might lead to greater motivation by making it easier to process and organise the information that is essential for the pursuit of goals.

Also, the capacity of an individual's verbal working memory has an impact on their ability to concentrate, maintain attention, and avoid distractions. Those with larger verbal working memory capacity may be more engaged in their tasks and persistent in their efforts because they are better able to keep their focus and resist interruptions or setbacks. Motivation to attain a goal requires consistent, prolonged work in addition to a determined will to succeed.

A similar result was found by **Alloway et al., (2009)** where they found that children with lower verbal working memory capacity had lower achievement motivation as compared to children with higher verbal working memory capacity.

Table 4.3.7: Comparison of Achievement Motivation of Study Groups

Achievement Motivation	N	Mean	S.D.	Mean Difference	't' score	p value
Boys with Low Verbal working memory	13	15.077	5.107	4.177	3.695	0.000
Boys with Average Verbal working memory	63	19.254	3.374			
Boys with Low Verbal working memory	13	15.077	5.107	4.673	2.119	0.041
Boys with High Verbal working memory	24	19.750	6.986			
Boys with Average Verbal working memory	63	19.254	3.374	0.496	0.446	0.657
Boys with High Verbal working memory	24	19.750	6.986			
Girls with Low Verbal working memory	25	19.480	4.331	1.589	2.486	0.015
Girls with Average Verbal working memory	58	21.069	1.497			
Girls with Low Verbal working memory	25	19.480	4.331	4.991	3.660	0.001
Girls with High Verbal working memory	17	24.471	4.346			
Girls with Average Verbal working memory	58	21.069	1.497	3.402	5.082	0.000
Girls with High Verbal working memory	17	24.471	4.346			
Boys with Low Verbal working memory	13	15.077	5.107	4.403	2.797	0.008
Girls with Low Verbal working memory	25	19.480	4.331			
Boys with Average Verbal working memory	63	19.254	3.374	1.815	3.768	0.000

Achievement Motivation	N	Mean	S.D.	Mean Difference	't' score	p value
Girls with Average Verbal working memory	58	21.069	1.497			
Boys with High Verbal working memory	24	19.750	6.986	4.721	2.464	0.018
Girls with High Verbal working memory	17	24.471	4.346			

Table 4.3.7 shows that the mean achievement motivation scores for boys with low verbal working memory are 15.077 and the mean achievement motivation scores for boys with average verbal working memory are 19.254. The difference in mean was 4.177 and 't' score was 3.695 and which at 1% level of significance was significant ($p=0.001$; $p<0.01$), which suggests that achievement motivation differs significantly between boys who have poor verbal working memory and boys with ordinary verbal working memory. In addition, the mean score indicates that boys with average verbal working memory are more motivated to achieve than boys with limited verbal working memory.

Table 4.3.7 illustrates that the average score of achievement motivation for boys with low verbal working memory is 15.077 and the mean score achievement motivation for boys with high verbal working memory is 19.750. The mean difference was 4.673, and the 't' score was 2.119, indicating that it is significant at the 5% level ($p=0.041$; $p<0.05$), which means that boys with a low verbal working memory and those with a high verbal working memory differ significantly in their motivation to achieve. In addition, the mean score indicates that boys with high verbal working memory are more motivated to achieve than boys with low verbal working memory.

Table 4.3.7 exhibits that the mean achievement motivation scores for boys with average verbal working memory are 19.254 and the mean achievement motivation scores for boys with high verbal working memory are 19.750. The mean difference was 0.496 and the t-score was 0.446, which is statistically insignificant at the 5% significance level ($p=0.657$; $p>0.05$), which implies that there is no significant difference between boys with average verbal working memory and boys with high verbal working memory with regard to achievement motivation. In addition, the mean

score indicates that males with high verbal working memory are equally motivated to achieve as those with ordinary verbal working memory.

Table 4.3.7 shows that the average achievement motivation scores for girls with low verbal working memory are 19.480 and average achievement motivation scores for girls with average verbal working memory are 21.069. The mean variance was determined as 1.589, while the 't' score was 2.486, and this is statistically significant at the 5% level of significance ($p = 0.015$; $p<0.05$), which implies that girls with low verbal working memory are significantly less motivated to achieve than those with average verbal working memory. In addition, the mean score indicates that girls with ordinary verbal working memory are more motivated to achieve than girls with limited verbal working memory.

Table 4.3.7 shows average achievement motivation scores for girls with low verbal working memory is 19.480, while those for girls with high verbal working memory is 24.471. The mean variance was 4.991, and the 't' score was 3.660, which is statistically significant at the 1% level of significance ($p=0.001$; $p<0.01$), which means that girls with low verbal working memory are significantly less motivated to achieve than those with high verbal working memory. In addition, the mean score indicates that girls with high verbal working memory are more motivated to achieve than girls with low verbal working memory.

Table 4.3.7 exhibits that the mean achievement motivation scores for girls with average verbal working memory are 21.069 and the mean achievement motivation scores for girls with high verbal working memory are 24.471. The difference in mean was 3.402 and ‘t’ score was 5.082 and it is significant at 0.01 level ($p=0.000$; $p<0.01$), which deduces that there is a significant difference between girls with average verbal working memory and girls with high verbal working memory in terms of their motivation to achieve. In addition, the mean score indicates that girls with high verbal working memory are more motivated to achieve than girls with average verbal working memory.

Table 4.3.7 shows that the mean score of achievement motivation for boys with low verbal working memory is 15.077 and the mean score of achievement motivation for girls with low verbal working memory is 19.480. The difference in mean was 4.403 and ‘t’ score was 2.797 and it is statistically significant at 1% level ($p=0.008$; $p<0.01$) which suggests that boys with low verbal working memory are significantly less

motivated to achieve than girls with low verbal working memory. In addition, the mean score indicates that girls with low verbal working memory have higher achievement motivation than boys with low verbal working memory.

Table 4.3.7 shows that average achievement motivation scores for boys with average verbal working memory are 19.254 and average achievement motivation scores for girls with average verbal working memory are 21.069. The difference in mean was 1.815 and 't' score was 3.768 and it is found to be significant at 1% level ($p=0.000$; $p<0.01$) and which implies that boys with average verbal working memory are significantly less motivated to achieve than girls with average verbal working memory. In addition, the mean score indicates that girls with average verbal working memory are more motivated to achieve than boys with average verbal working memory.

Table 4.3.7 reveals that average achievement motivation score for boys with a strong verbal working memory is 19.750, while average achievement motivation score for girls with a strong verbal working memory is 24.471. The difference in mean was 4.721 and 't' score was 2.464 and it is significant at 5 % level of significance ($p=0.018$; $p<0.05$), which implies that boys with high verbal working memory and girls with high verbal working memory differ significantly in their achievement motivation. In addition, the mean score indicates that girls with high verbal working memory are more motivated to achieve than boys with high verbal working memory.

Table 4.3.8 : Association between Gender and Achievement Motivation

		Achievement Motivation		Total	Chi Square
		Below Average	Above Average		(p value)
Boys	F	48	52	100	20.353
	%	48.0%	52.0%	100.0%	0.000
Girls	F	18	82	100	
	%	18.0%	82.0%	100.0%	
Total	F	66	134	200	
	%	33.0%	67.0%	100.0%	

Table 4.3.8 shows that out of total boys, 48 % boys are having achievement motivation below average while rest of 52 % boys are having above average achievement motivation. While out of total girls, 18 % girls are having achievement motivation below average while rest of 82 % girls are having above average achievement motivation. The value of chi-square is 20.353 and it is significant at the 1% level ($p=0.000$; $p<0.01$), which suggests that there are significant differences among boys' and girls' achievement motivation.

The formation of a drive to excel in one's chosen field can be affected by the norms and expectations of society. It's possible that girls receive greater praise, support, and encouragement for their academic accomplishments, all of which might lead to higher levels of motivation. Additionally, during the past several years, societal transformations have taken place that have promoted gender equality and empowered girls, which may have had a favourable influence on the levels of motivation that girls exhibit.

The motivation of students may be significantly influenced by both their teachers and their parents. According to the findings of several studies, educators have a tendency to offer more positive comments and encouragement to female students, which might help boost their motivation. In a similar vein, the expectations of parents for their daughters and their engagement in their daughters' education can have a good impact on the girls' desire to learn.

According to the results of the investigation by **Jacobs et al 2002**, females often have greater levels of self-competence and values in areas that are usually connected with academic achievement, such as language arts and social studies. It was shown that girls' motivation and self-perceptions in these areas were impacted by variables such as supportive parental and teacher feedback, personal interest, and the internalisation of society's expectations for academic accomplishment.

Table 4.3.9 : Association between Levels of Verbal working memory and Achievement Motivation

		Achievement Motivation		Total	Chi Square
		Below Average	Above Average		(p value)
Low Verbal working memory	F	26	12	38	27.142
	%	68.4%	31.6%	100.0%	0.000
Average Verbal working memory	F	28	93	121	
	%	23.1%	76.9%	100.0%	
High Verbal working memory	F	12	29	41	
	%	29.3%	70.7%	100.0%	
Total	F	66	134	200	
	%	33.0%	67.0%	100.0%	

Table 4.3.9 shows that out of total students having low verbal working memory, 68.4 % students are having achievement motivation below average while rest of 31.6 % students are having achievement motivation above average.

Table 4.3.9 reflects that out of total students with average verbal working memory, 23.1 % students with average verbal working memory are having achievement motivation below average while rest of 76.9 % students with average verbal working memory are having achievement motivation above average.

Table 4.3.9 demonstrates that out of total students with high verbal working memory, 29.3 % students with high verbal working memory are having achievement motivation below average while rest of 70.7 % students with high verbal working memory are having achievement motivation above average.

The chi-square value is calculated to be 27.142 and it is significant at 1% level ($p=0.000$; $p<0.01$) which suggests that there is significant variance in achievement motivation of students with different levels (low/average/high) of verbal working memory.

Students with a greater ability for verbal working memory may have had greater academic achievement in the past as a result of their superior cognitive talents. This

positive reinforcement and history of achievement can further build their conviction in their own skills and increase their drive to continue obtaining successful outcomes.

Alloway & Alloway (2010) found that students who had a greater capacity for verbal working memory also exhibited higher levels of achievement motivation, which in turn, favourably improved their academic success.

Table 4.3.10 : Correlation between Verbal working memory and Achievement Motivation

	Coefficient of Correlation	p value
Boys (N = 100)	0.297	0.003
Girls (N = 100)	0.575	0.000
Total Sample (N = 200)	0.345	0.000

Table 4.3.10 reveals that the correlation coefficient among verbal working memory and achievement motivation is 0.297, which is statistically significant at the 0.01 level for boys ($p=0.003$; $p<0.01$) which infers that a significant positive correlation exists between verbal working memory of boys and their achievement motivation. It infers that achievement motivation increases with increase in verbal working memory and vice versa.

Table 4.3.10 displays that the coefficient of correlation between verbal working memory and achievement motivation is 0.575 and it is statistically significant at 1% for girls ($p=0.000$; $p<0.01$) which infers that a significant positive correlation exists among verbal working memory and achievement motivation for girls. It infers that achievement motivation increases with increase in verbal working memory and vice versa for girls.

Table 4.3.10 exhibits that the correlation coefficient among verbal working memory and achievement motivation is calculated as 0.345 which is significant at 1% level for total sample ($p=0.000$; $p<0.01$), which deduces that a significant positive correlation exists among verbal working memory and achievement motivation for total sample. It infers that achievement motivation increases with increase in verbal working memory and vice versa for total sample.

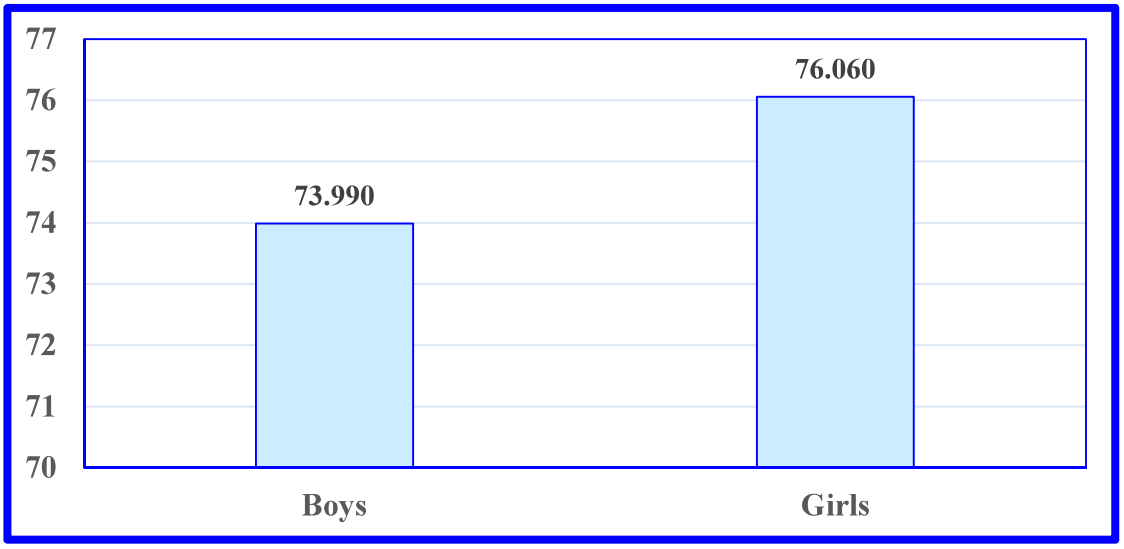
4.4 Academic Performance

Table 4.4.1 displays mean, standard deviation and different categories of academic performance scores of boys and girls.

Table 4.4.1 : Mean, S.D. and Category of Academic performance for Boys and Girls

Academic performance	N	Mean	S.D.	Category
Total Sample of Boys	100	73.99	7.75	Average
Total Sample of Girls	100	76.06	6.59	Average

The table shows that mean score of academic performance for boys is 73.99 which shows that they are having an average level of academic performance. Similarly, the girls have a mean academic performance score of 76.06 which is categorized as average level of academic performance.

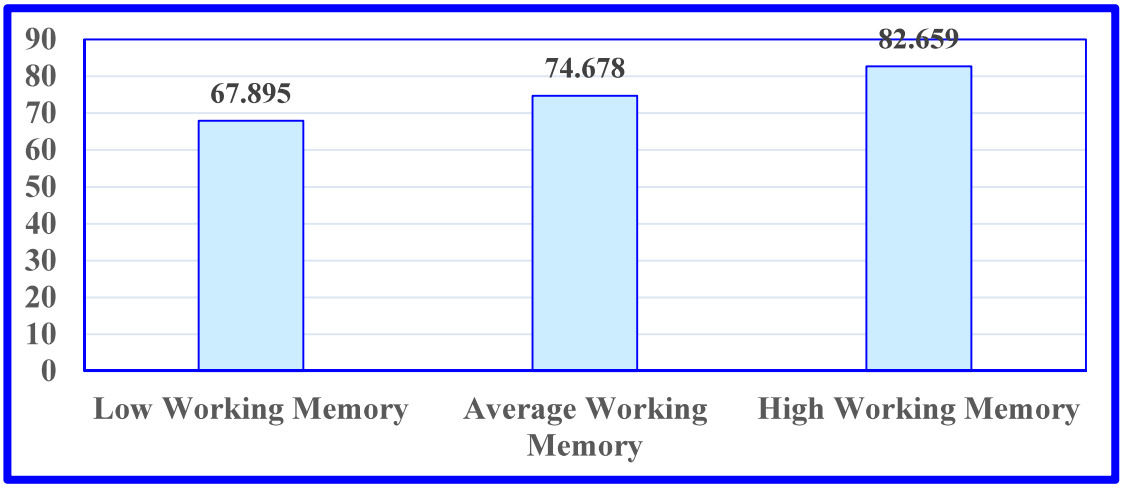


Graph 4C 1 : Mean academic performance scores for boys and girls

Table 4.4.2 : Mean, S.D. and Category of Academic performance Scores of students with different levels of Verbal working memory

Academic performance	N	Mean	S.D.	Category
Total Sample with Low Verbal working memory	38	67.90	7.29	Low
Total Sample with Average Verbal working memory	121	74.68	5.19	Average
Total Sample with High Verbal working memory	41	82.66	4.79	High

Table 4.4.2 shows that mean score of academic performance for students from low verbal working memory group is 67.90, which means that they have a low academic performance. Similarly, the average score of academic performance for students from average level verbal working memory group is 74.68, and this shows that they have an average academic performance. Furthermore, the mean scores of academic performance for students from high level verbal working memory group is 82.66, and which means that they are having average level of academic performance.



Graph 4C2 : Mean academic performance scores for different levels of verbal working memory

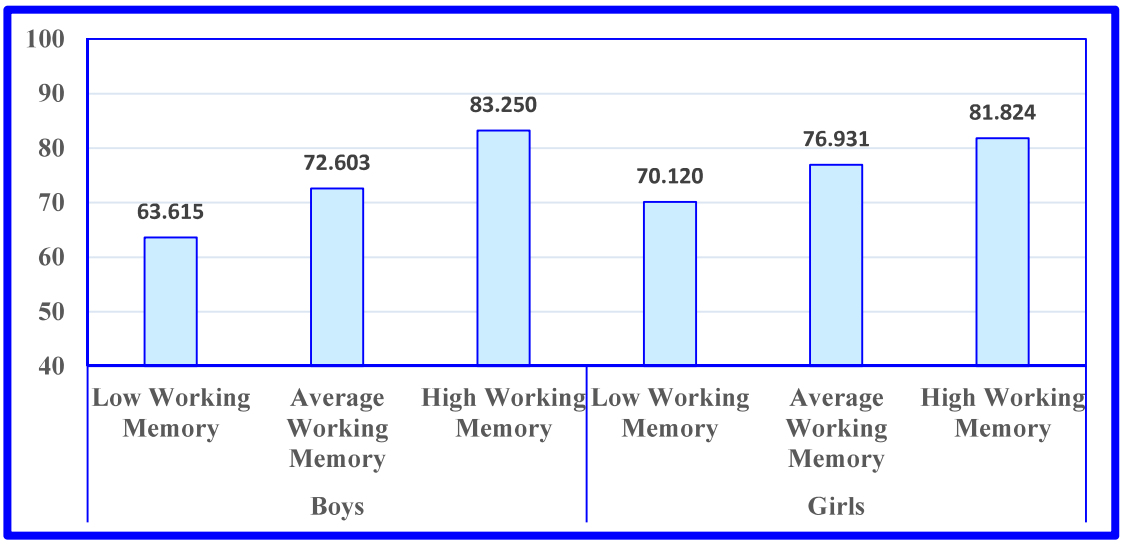
Table 4.4.3 : Mean S.D. and Category of Academic performance Scores for Study Groups

Academic performance	N	Mean	S.D.	Category
Boys with Low Verbal working memory	13	63.62	3.01	Low
Boys with Average Verbal working memory	63	72.60	5.73	Average
Boys with High Verbal working memory	24	83.25	3.07	High
Girls with Low Verbal working memory	25	70.12	7.89	Average
Girls with Average Verbal working memory	58	76.93	3.33	Average
Girls With High Verbal working memory	17	81.82	6.52	High

Table 4.4.3 shows the mean academic performance scores of boys with low verbal working memory category group is 63.62 which is categorized as low level of academic performance while the mean academic performance scores of boys with average verbal working memory category group is 72.60 which is categorized as average academic performance and the average academic performance of boys with

high verbal working memory category group is 83.25 which is categorized as high level of academic performance.

Table 4.4.3 also depicts that the mean academic performance scores of girls with low verbal working memory category group is 70.12 and it is categorized as average academic performance while the average score for academic performance of girls with average verbal working memory category group is 76.93 and it is categorized as average academic performance and the mean score for academic performance of girls with high verbal working memory category group is 81.82 which is categorized as high level of academic performance.



Graph 4C 3: Mean academic performance scores for study groups

Table 4.4.4 shows two-way anova for academic performance.

Table 4.4.4 : Two-way ANOVA for Academic Performance

Source	Sum of Squares	df	Mean Square	F-Ratio	Sig.
Type of Gender (A)	353.146	1	353.146	13.258	0.000
Levels of Verbal working memory(B)	4529.868	2	2264.934	85.031	0.000
A X B	339.367	2	169.683	6.370	0.002
Error	5167.491	194	26.637		
Total	10450.875	199			

Table 4.4.4 shows that F-ratio for Type of Gender (Boys/Girls) for academic performance is calculated to be 13.258 and it is significant at 1% level ($p=0.000$; $p<0.01$) which suggests that a significant difference exists in the level of academic

achievement of boys and girls. It's possible because boys and girls have distinct interests and approaches to learning. Girls, for instance, are more likely to pay attention and concentrate on specifics, whereas boys may be more inclined to learn via physical activity and hands-on experience. The various approaches to instruction utilised in various educational environments can have a direct impact on how well students are able to achieve academically.

Table 4.4.4 displays that F-ratio for Levels of Verbal working memory (Low/Average/High) for academic performance is calculated to be 85.031 and it is significant at 1% level ($p=0.000$; $p<0.01$) which means that a significant difference exists in the level of achievement of students with different levels of verbal working memory. It may be because planning and organisation of activities use verbal working memory. Students with higher capacity for verbal working memory are better prepared to handle many tasks, set objectives, and devise successful methods for the completion of task assignments. Their capacity for organisation can result in more productive study habits and an overall improvement in their academic achievement.

Tables 4.4.4 also reflects that F-ratio for interaction of independent variables (Type of Gender & Levels of verbal working memory) for academic performance is 6.370 and it is significant at 1% level ($p=0.002$; $p<0.01$). **Alloway et al (2009)** confirmed that children who had a limited capacity for verbal working memory had challenges with task planning, organisation, and goal setting. They were unable to effectively manage many activities at once, prioritise information, or devise efficient ways for completing tasks. These challenges in managing one's workload were linked to lower academic achievement in a variety of courses.

Table 4.4.5 : Comparison of Academic Performance of Boys and Girls

	Academic Performance	
	Boys	Girls
N	100	100
Mean	73.990	76.060
Std. Deviation	7.745	6.589
Mean Difference	2.070	
't' score	2.036	
p value	0.043	

Table 4.4.5 shows that the mean academic performance scores for boys are 73.990 and the mean academic performance scores for girls are 76.060. The difference in mean was 2.070 and 't' score was 2.036 and it is significant at 5% level ($p=0.043$; $p<0.05$) which deduces that a significant difference exists in the academic performance between boys and girls. Furthermore, the mean score reflects that girls have higher academic performance in comparison to boys. This may be because girls may have higher levels of intrinsic drive and greater conviction in their academic ability, both of which can favourably impact their performance, especially in countries like India where for ages girls were not provided enough opportunities to study and excel, more so in the case of academic achievement. On the other hand, boys may experience difficulties connected to the expectations of society or may display different motives, both of which might have an effect on the academic results they achieve.

Table 4.4.6 shows comparison of academic performance of students with different levels of verbal working memory.

Table 4.4.6 : Comparison of Academic Performance of students with different levels of Verbal working memory

Academic Performance	N	Mean	Std. Deviation	Mean Difference	't' score	p value
Low Verbal working memory	38	67.895	7.289	6.783	6.339	0.000
Average Verbal working memory	121	74.678	5.190			
Low Verbal working memory	38	67.895	7.289	14.764	10.715	0.000
High Verbal working memory	41	82.659	4.789			
Average Verbal working memory	121	74.678	5.190	7.981	8.672	0.000
High Verbal working memory	41	82.659	4.789			

Table 4.4.6 shows that the mean academic performance scores for students with low verbal working memory are 67.895 and the mean academic performance scores for students with average verbal working memory are 74.678. The difference in mean was 6.783 and 't' score was 6.339 and it is significant at 1% level ($p=0.000$; $p<0.01$), which deduces that a significant difference is there in academic performance between students with low and average verbal working memory. Furthermore, mean score reflects that students with average verbal working memory have higher academic performance in comparison to students with low verbal working memory.

Table 4.4.6 illustrates that the mean academic performance scores for students with low verbal working memory are 67.895 and the mean academic performance scores for students with high verbal working memory are 82.659. The difference in mean was 14.764 and 't' score was 10.715 and it is significant at 1% level ($p=0.000$; $p<0.01$), which deduces that a significant difference exists in academic performance between students with low and high verbal working memory. Furthermore, mean score reflects that students with high verbal working memory have higher academic performance in comparison to students with low verbal working memory.

Table 4.4.6 exhibits that the mean academic performance scores for students with average verbal working memory are 74.678 and the mean academic performance scores for students with high verbal working memory are 82.659. The difference in mean was calculated to be 7.981 and 't' score was 8.672 and it is significant at 0.01 level ($p=0.000$; $p<0.01$), which infers that there is a significant difference between the academic performance of students with average and high verbal working memory. In addition, the mean score indicates that students with superior verbal working memory perform better academically than those with ordinary verbal working memory.

Verbal working memory is linked to one's ability to learn and remember verbal information and as such students who have a greater verbal working memory capacity are able to encode, retain, and recall knowledge relevant to language-based courses such as reading, writing, and foreign languages more effectively. This has the potential to lead to increased performance on assessments as well as enhanced recall of previously taught content.

Similarly, the ability to digest language and comprehend it is inextricably linked to one's verbal working memory and so, students with higher verbal working memory capacity have an edge when it comes to the processing and comprehension of verbal

information. This can lead to increased comprehension of academic materials, instructions, and lectures, which in turn can contribute to enhanced academic achievement.

A research was conducted by **Gathercole et al (2004)** on children from the ages of 4 to 15 years old to see how their working memory capacity changes over time. It investigated the connection between working memory and a variety of academic talents, including language-based topics like reading and writing, as well as other academic abilities. According to the findings of the study, one's capacity to hold verbal information in their working memory was a major predictor of language-related skills such as reading comprehension and vocabulary. Children who had a greater ability for retaining and manipulating linguistic information in their working memory performed better on activities that required them to do so. In addition to this, the children's performance in activities requiring written language, such as spelling and the building of sentences, was significantly improved.

Table 4.4.7 showing comparison of academic performance of study groups

Table 4.4.7 : Comparison of Academic Performance of Study Groups

Academic Performance	N	Mean	S.D.	Mean Difference	't' score	p value
Boys with Low Verbal working memory	13	63.615	3.015	8.988	5.481	0.000
Boys with Average Verbal working memory	63	72.603	5.729			
Boys with Low Verbal working memory	13	63.615	3.015	19.635	18.694	0.000
Boys with High Verbal working memory	24	83.250	3.068			
Boys with Average Verbal working memory	63	72.603	5.729	10.647	8.624	0.000
Boys with High Verbal working memory	24	83.250	3.068			
Girls with Low Verbal working memory	25	70.120	7.892	6.811	5.556	0.000

Academic Performance	N	Mean	S.D.	Mean Difference	't' score	p value
Girls with Average Verbal working memory	58	76.931	3.329			
Girls with Low Verbal working memory	25	70.120	7.892	11.704	5.049	0.000
Girls with High Verbal working memory	17	81.824	6.521			
Girls with Average Verbal working memory	58	76.931	3.329	4.892	4.184	0.000
Girls with High Verbal working memory	17	81.824	6.521			
Boys with Low Verbal working memory	13	63.615	3.015	6.505	2.850	0.007
Girls with Low Verbal working memory	25	70.120	7.892			
Boys with Average Verbal working memory	63	72.603	5.729	4.328	5.024	0.000
Girls with Average Verbal working memory	58	76.931	3.329			
Boys with High Verbal working memory	24	83.250	3.068	1.426	0.938	0.354
Girls with High Verbal working memory	17	81.824	6.521			

Table 4.4.7 shows that the mean academic performance scores for boys with low verbal working memory are 63.615 and the mean academic performance scores for boys with average verbal working memory are 72.603. The difference in mean was 8.988 and 't' score was 5.481 and it is significant at 0.01 level ($p=0.000$; $p<0.01$). It deduces that a significant difference exists in academic performance between boys with low and average verbal working memory. Furthermore, the mean score reflects that boys with average verbal working memory have higher academic performance in comparison to boys with low verbal working memory.

Table 4.4.7 illustrates that the mean academic performance scores for boys with low verbal working memory are 63.615 and the mean academic performance scores for boys with high verbal working memory are 83.250. The average difference was 19.635 and 't' score was 18.694 and it is significant at 0.01 level ($p=0.000$; $p<0.01$), which infers that a significant difference is there the in academic performance between boys with low and boys with high verbal working memory. Also, the mean score reflects that boys with high verbal working memory have higher academic performance in comparison to boys with low verbal working memory.

Table 4.4.7 exhibits that the mean academic performance scores for boys with average verbal working memory are 72.603 and the mean academic performance scores for boys with high verbal working memory are 83.250. The average difference was 10.647 and 't' score was 8.624 and it is significant at 0.01 level ($p=0.000$; $p<0.01$). It tells that there exists a significant difference in the academic performance among boys with average and high verbal working memory. Furthermore, mean score reflects that boys with high verbal working memory have higher academic performance in comparison to boys with average verbal working memory.

Table 4.4.7 shows that the mean academic performance scores for girls with low verbal working memory are 70.120 and the mean academic performance scores for girls with average verbal working memory are 76.931. The difference in mean was 6.811 and 't' score was 5.556 and it is significant at 0.01 level ($p=0.000$; $p<0.01$). It tells that there exists a significant difference in the academic performance among girls with low and average verbal working memory. Moreover, mean score reflects that girls with average verbal working memory have higher academic performance in comparison to girls with low verbal working memory.

Table 4.4.7 illustrates that the mean academic performance scores for girls with low verbal working memory are 70.120 and the mean academic performance scores for girls with high verbal working memory are 81.824. The difference in mean was 11.704 and 't' score was 5.049 and it is significant at 0.01 level ($p=0.000$; $p<0.01$), which infers that a significant difference exists in the academic performance among girls with low and high verbal working memory. Furthermore, mean score reflects that girls with high verbal working memory have higher academic performance in comparison to girls with low verbal working memory.

Table 4.4.7 exhibits that the mean academic performance scores for girls with average verbal working memory are 76.931 and the mean academic performance scores for girls with high verbal working memory are 81.824. The difference in mean was 4.892 and 't' score was 4.184 and it is significant at 0.01 level ($p=0.000$; $p<0.01$). It deduces that a significant difference exists in the academic performance among girls with average and high verbal working memory. In addition to the above, mean score reflects that girls with high verbal working memory have higher academic performance in comparison to girls with average verbal working memory.

Table 4.4.7 shows that the mean academic performance scores for boys with low verbal working memory are 63.615 and the mean academic performance scores for girls with low verbal working memory are 70.120. The average difference was 6.505 and 't' score was 2.850 and it is significant at 0.01 level ($p=0.007$; $p<0.01$), which infers that a significant difference exists in the academic performance among boys with low and girls with low verbal working memory. Furthermore, mean score reflects that girls with low verbal working memory have higher academic performance in comparison to boys with low verbal working memory.

Table 4.4.7 shows that the mean academic performance scores for boys with average verbal working memory are 72.603 and the mean academic performance scores for girls with average verbal working memory are 76.931. The average difference was 4.328 and 't' score was 5.024 and it is significant at 0.01 level ($p=0.000$; $p<0.01$), which means that a significant difference exists in the academic performance among boys and girls with average verbal working memory. Furthermore, mean score reflects that girls with average verbal working memory have higher academic performance in comparison to boys with average verbal working memory.

Table 4.4.7 shows that the mean academic performance scores for boys with high verbal working memory are 83.250 and the mean academic performance scores for girls with high verbal working memory are 81.824. The difference in mean was 1.426 and 't' score was 0.938 and it is insignificant at 5% level ($p=0.354$; $p>0.05$). It means that there exists no significant difference in the academic performance between boys and girls with high verbal working memory. Additionally, mean score reflects that girls with high verbal working memory and boys with high verbal working memory have similar academic performance.

Table 4.4.8 : Association between Gender and Academic Performance

		Academic Performance		Total	Chi Square
		Below Average	Above Average		(p value)
Boys	F	60	40	100	8.000
	%	60.0%	40.0%	100.0%	0.000
Girls	F	40	60	100	
	%	40.0%	60.0%	100.0%	
Total	F	100	100	200	
	%	50.0%	50.0%	100.0%	

Table 4.4.8 shows that out of total boys, 60 % boys are having academic performance below average while rest of 40 % boys are having academic performance above average. While out of total girls, 40 % girls are having academic performance below average while rest of 60 % girls are having academic performance above average. The chi-square value is calculate to be 8.000 and it is significant at 0.01 level ($p=0.000$; $p<0.01$), which means that a significant difference is there in the academic performance of boys and girls. It's possible that boys and girls go through distinct emotional experiences and have varying levels of socio-emotional development, both of which can have an effect on their academic achievement. Girls, on average, tend to demonstrate higher levels of emotional awareness and self-regulation abilities, both of which might lead to stronger coping strategies and resilience in academic contexts. Girls also tend to be more resilient. When confronted with academic obstacles, boys, on the other hand, may have difficulty expressing their feelings and looking for support from others.

According to the findings of the study conducted by **Zeman, J., Cassano, M., Perry-Parrish, C., & Stegall, S. (2006)**, girls, on an average, display greater levels of emotional awareness and self-regulation than boys do. This is in comparison to their male counterparts. Girls were more likely to participate in adaptive techniques for emotion regulation, such as talking about their feelings, seeking assistance, and using coping skills. This was especially true in situations when they felt overwhelmed by their emotions. These abilities were linked to improved academic achievements as well as greater resiliency in academic settings.

Table 4.4.9 showing association between levels of verbal working memory and academic performance.

Table 4.4.9 : Association between Levels of Verbal working memory and Academic Performance

		Academic Performance		Total	Chi Square
		Below Average	Above Average		(p value)
Low Verbal working memory	F	33	5	38	44.145
	%	86.8%	13.2%	100.0%	0.000
Average Verbal working memory	f	62	59	121	
	%	51.2%	48.8%	100.0%	
High Verbal working memory	F	5	36	41	
	%	12.2%	87.8%	100.0%	
Total	F	100	100	200	
	%	50.0%	50.0%	100.0%	

Table 4.4.9 shows that out of total students with low level of verbal working memory, 86.8 % students are having academic performance below average while rest of 13.2 % students are having academic performance which is above average.

Table 4.4.9 reflects that out of total students with average verbal working memory, 51.2 % students with average verbal working memory are having academic performance below average while rest of 48.8 % students with average verbal working memory are having academic performance above average.

Table 4.4.9 demonstrates that out of total students with high verbal working memory, 12.2 % students with high verbal working memory are having academic performance below average while rest of 87.8 % students with high verbal working memory are having academic performance above average.

The chi-square value is 44.145 and it is significant at 0.01 level ($p=0.000$; $p<0.01$). It means that there exists a significant difference in the academic performance of students with different levels (low/average/high) of verbal working memory. This may be because verbal working memory is closely tied with language processing abilities, effective written expression as well as problem-solving tasks that require

mental manipulation of information, which not only helps students to articulate their thoughts, organize their thoughts, generate coherent and well-structured essays, and utilize a wider range of vocabulary and sentence structures and facilitates more efficient problem-solving and which contributes to better academic performance in subjects that require these skills.

The above results were also similar to findings of the study by **Alloway, T. P., Gathercole, S. E., & Pickering, S. J. (2006)** which investigated the influence that one's verbal and visuospatial working memories have on one's academic performance and the link between the two. The findings indicate that verbal as well as visuospatial working memory are vital determinants of academic success. This conclusion highlights the relevance of verbal working memory in a variety of academic activities.

Table 4.4.10 : Correlation between Verbal working memory and Academic Performance

	Coefficient of Correlation	p value
Boys (N = 100)	0.930	0.000
Girls (N = 100)	0.694	0.000
Total Sample (N = 200)	0.782	0.000

Table 4.4.10 shows that the coefficient of correlation among verbal working memory and academic performance is 0.930 and it is significant at 0.01 level for boys ($p=0.000$; $p<0.01$). It tells that there a significant positive correlation is there among verbal working memory and academic performance for boys. It infers that verbal working memory increases with increase in academic performance and vice versa for boys.

Table 4.4.10 displays that the coefficient of correlation among verbal working memory and academic performance is 0.694 and it is significant at 0.01 level for girls ($p=0.000$; $p<0.01$), which suggests that there exists a significant positive correlation between verbal working memory and academic performance for girls. It also implies that verbal working memory increases with increase in academic performance and vice versa for girls.

Table 4.4.10 exhibits that the coefficient of correlation among verbal working memory and academic performance is 0.782 and it is significant at 0.01 level for total sample ($p=0.000$; $p<0.01$), which suggests that a significant positive correlation exists

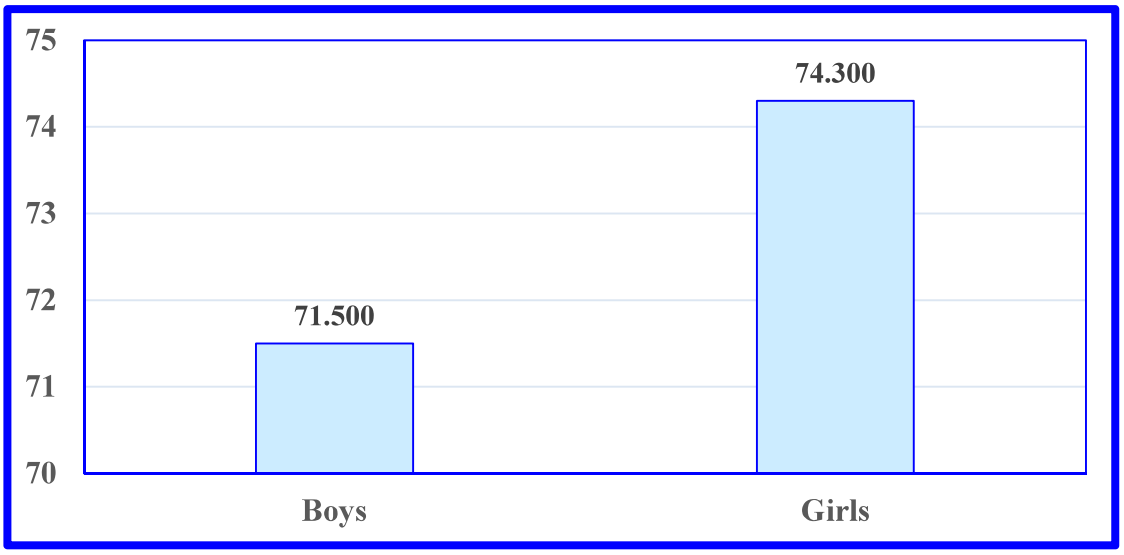
among verbal working memory and academic performance for total sample. It infers that verbal working memory increases with increase in academic performance and vice versa for total sample.

4.5 Study Habit

Table 4.5.1 : Mean, S.D. and Category of Study Habit Scores for Boys and Girls

Study habit	N	Mean	S.D.	Category
Total Sample of Boys	100	71.50	7.32	Average
Total Sample of Girls	100	74.30	8.82	Average

Table 4.5.1 shows that mean score of study habit for boys is 71.50 showing average level of study habit. Similarly, the girls have a mean study habit score of 74.30 which is average level of study habit.

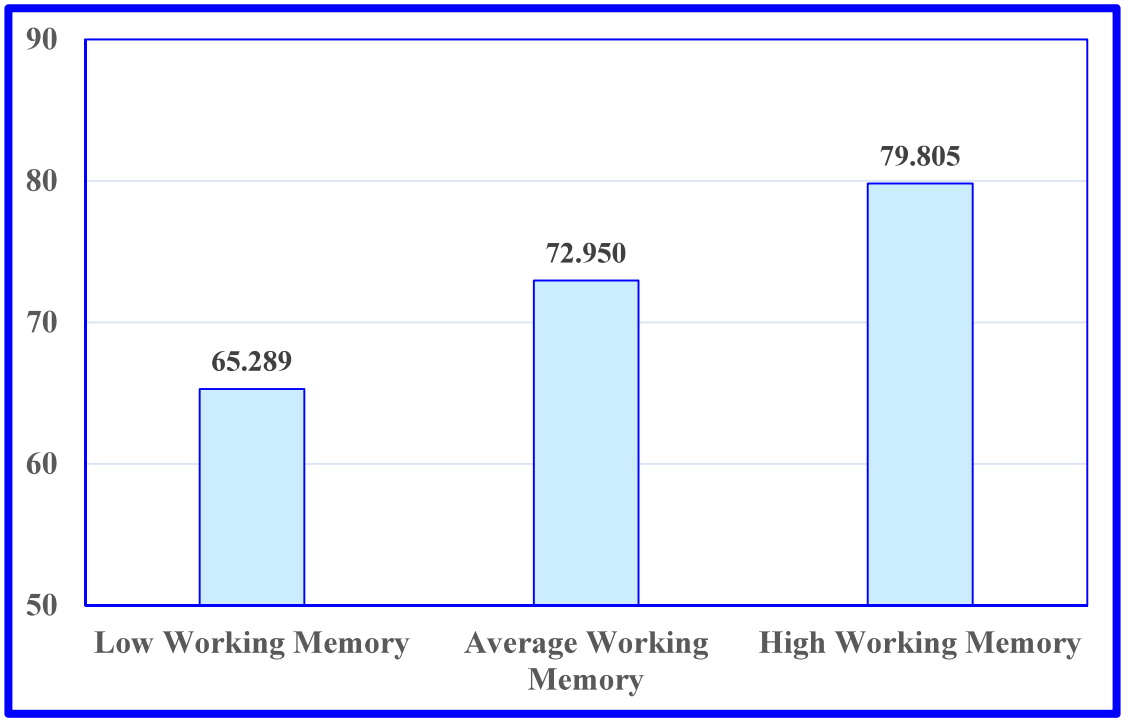


Graph 4D 1 : Mean study habit scores for boys and girls

Table 4.5.2 : Mean, S.D. and Category of Study Habit Scores of students with different levels of Verbal working memory

Study habit	N	Mean	S.D.	Category
Total Sample with Low Verbal working memory	38	65.29	8.67	Low
Total Sample with Average Verbal working memory	121	72.95	6.06	Average
Total Sample with High Verbal working memory	41	79.81	7.15	Average

Table 4.5.2 shows that average study habit score for students from low verbal working memory group is 65.29 indicating that they are having low level of study habit. Similarly, the mean scores of study habit for students from average level verbal working memory group is 72.95 and which indicates that they are having average level of study habit. Furthermore, the mean scores of study habit for students from high level verbal working memory group is 79.81 indicating that they are having average level of study habit.



Graph 4D 211 : Mean study habit scores for different levels of verbal working memory

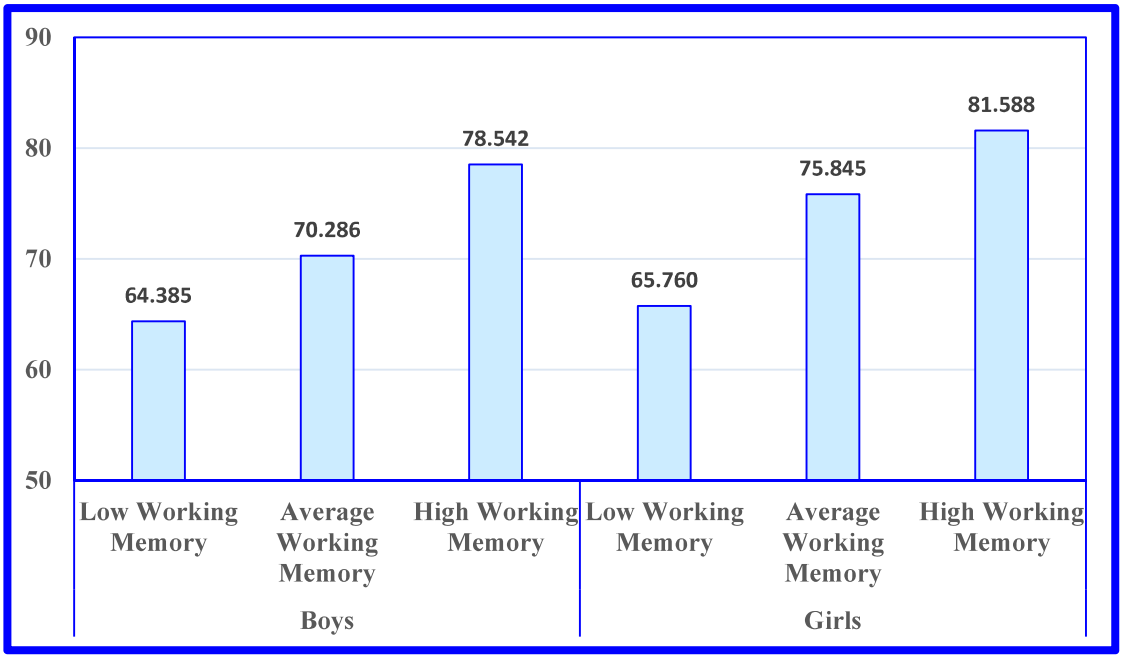
Table 4.5.3 : Mean S.D. and Category of Study Habit Scores for Study Groups

Study habit	N	Mean	S.D.	Category
Boys with Low Verbal working memory	13	64.38	7.75	Low
Boys with Average Verbal working memory	63	70.29	5.19	Average
Boys with High Verbal working memory	24	78.54	6.51	Average
Girls with Low Verbal working memory	25	65.76	9.23	Average
Girls with Average Verbal working memory	58	75.84	5.63	Average
Girls with High Verbal working memory	17	81.59	7.82	High

Table 4.5.3 displays the mean score of study habit of boys with low verbal working memory category group is 64.38 which is categorized as low level of study habit

while the mean study habit scores of boys with average verbal working memory category group is 70.29 and it is categorized as average study habit and the mean score of study habit of boys with high verbal working memory category group is 78.54 and it is categorized as average study habit.

Table 4.5.3 also depicts that the mean study habit scores of girls with low verbal working memory category group is 65.76 and it is categorized as average study habit while the mean score of study habit of girls with average verbal working memory category group is 75.84 and it is categorized as average study habit and the mean score of study habit of girls with high verbal working memory category group is 81.59 and it is categorized as high study habit.



Graph 4D 3 : Mean study habit scores for study groups

Table 4.5.4 : Two-way ANOVA for Study Habit

Source	Sum of Squares	df	Mean Square	F-Ratio	Sig.
Type of Gender (A)	397.647	1	397.647	9.412	0.002
Levels of Verbal working memory (B)	4135.747	2	2067.873	48.946	0.000
A X B	136.658	2	68.329	1.617	0.201
Error	8196.173	194	42.248		
Total	13394.000	199			

Table 4.5.4 shows that F-ratio for Type of Gender (Boys/Girls) for study habit is 9.412 and it is significant at 0.01 level ($p=0.002$; $p<0.01$), which suggests that there exists a significant difference in the study patterns of boys and girls. There can be several reasons which are responsible for this, including social expectations where girls are generally encouraged to be more diligent, organised, and focused on academic accomplishment, which can translate into more structured and disciplined study habits. Girls who are encouraged to be more hardworking, organised, and focused on academic achievement typically get better grades. On the other hand, the expectations placed on boys may be different and place a higher priority on other activities or may not place as much of an emphasis on good study habits.

Also, according to the findings of certain studies, girls often have more ambitious academic goals than boys do. The pursuit of higher academic goals can result in increased desire and investment in one's studies, which in turn can lead to the development of study habits that are more consistent and productive. This was corroborated in a study by **Simpkins, S. D., Davis-Kean, P. E., & Eccles, J. S. (2006)**. The objective of this assessment was to find out, in a longitudinal fashion, the link between adolescents' academic aspirations and their academic accomplishment in math and science. According to the data, it was found that females were more likely than boys to set greater academic objectives in the field of science and numeracy. The pursuit of these lofty objectives was connected with increased motivation and involvement in their studies, including the establishment of habitual approaches to learning that were both consistent and productive.

Table 4.5.4 displays that F-ratio for Levels of Verbal working memory (Low/Average/High) for study habit is 48.946 and it is significant at 0.01 level ($p=0.000$; $p<0.01$). It deduces that there exists a significant difference in the study habits of students with different levels of verbal working memory. It can be because students that have a greater ability for holding verbal information in their verbal working memory may have an edge when it comes to organising and integrating verbal content. They are able to cognitively organise information and make connections between disparate pieces of data, making it simpler for them to generate associations with significant and comprehend complicated concepts. Their capacity to efficiently establish structured study plans, find connections between various concepts, and synthesise material is improved as a result of this skill.

However, Table 4.5.4 also shows that F-ratio for interaction of independent variables (Type of Gender & Levels of verbal working memory) for study habit is 1.617 and it is insignificant at 5% level (p=0.201; p>0.05).

Table 4.5.5 : Comparison of Study Habits of Boys and Girls

	Study Habit	
	Boys	Girls
N	100	100
Mean	71.500	74.300
Std. Deviation	7.323	8.815
Mean Difference	2.800	
't' score	2.443	
p value	0.015	

Table 4.5.5 shows that the mean study habit scores for boys are 71.500 and the mean study habit scores for girls are 74.300. The difference in mean was 2.800 and 't' score was 2.443 and it is significant at 5% level (p=0.015; p<0.05). It suggests that a significant difference exists in the study habits between boys and girls. Furthermore, mean score reflects that girls have more study habits in comparison to boys. A number of factors, including socialisation and cultural standards, motivation and goal orientation, emotional control and self-discipline, influence from peers, and social comparison, contribute to the large gap in the study habits among the two gender. Girls typically have better study habits than boys, which may be the result of a greater societal emphasis on the academic success of girls, higher levels of motivation and setting objectives, greater emotional regulation and self-control skills, and influences from peers such as cooperative learning and social comparison. However, it is essential to keep in mind that individuals of the same gender might display a wide range of characteristics, and that scholastic practises can fluctuate significantly depending on the setting and the community.

Table 4.5.6 : Comparison of Study Habits of students with different levels of Verbal working memory

Study Habit	N	Mean	S.D.	Mean Difference	't' score	p value
Low Verbal working memory	38	65.289	8.671	7.661	6.087	0.000
Average Verbal working memory	121	72.950	6.062			
Low Verbal working memory	38	65.289	8.671	14.515	8.140	0.000
High Verbal working memory	41	79.805	7.153			
Average Verbal working memory	121	72.950	6.062	6.854	5.971	0.000
High Verbal working memory	41	79.805	7.153			

Table 4.5.6 shows that the mean study habit scores for students with low verbal working memory are 65.289 and the mean study habit scores for students with average verbal working memory are 72.950. The difference in mean was 7.661 and 't' score was 6.087 and it is significant at 0.01 level ($p=0.000$; $p<0.01$). It suggests that a significant difference exists in the study habits between students with low and average verbal working memory. Furthermore, mean score reflects that students with average verbal working memory have better level of study habits in comparison to students with low verbal working memory.

Table 4.5.6 illustrates that the mean study habit scores for students with low verbal working memory are 65.289 and the mean study habit scores for students with high verbal working memory are 79.805. The average difference was 14.515 and 't' score was 8.140 and it is significant at 0.01 level ($p=0.001$; $p<0.01$). It indicates that there exists a significant difference in the study habits between students with low and high verbal working memory. Furthermore, mean score reflects that students with high verbal working memory have better study habits in comparison to students with low verbal working memory.

Table 4.5.6 exhibits that the mean study habit scores for students with average verbal working memory are 72.950 and the mean study habit scores for students with high verbal working memory are 79.805. The average difference was 6.854 and 't' score was 5.971 and it is significant at 0.01 level ($p=0.000$; $p<0.01$). It deduces that a significant difference is present in the study habits between students with average and high verbal working memory. In addition, mean score reflects that students with high verbal working memory have better study habits in comparison to students with average verbal working memory.

The cognitive benefits that are linked with having a larger verbal working memory capacity can be related to the considerable variation in studying habits that exists between students who have varying degrees of verbal working memory capacity. These benefits include greater processing and retention of verbal knowledge, increased cognitive capacities, heightened understanding and analysis, higher planning and organisational skills, and more effective information retrieval. Conversely, lower verbal working memory will have an adverse impact on the effectiveness of study habits.

According to **Engle et al. (1999)**, students who had a higher capacity for verbal working memory were able to integrate and link knowledge in a more effective manner, which led to a deeper grasp of difficult concepts and improved recall of previously taught content.

Students having greater verbal working memory capacity may also have stronger metacognitive abilities, such as the ability to self-monitor and self-regulate. They are more aware of their progress in learning, are able to recognise areas in which they are having trouble, and are able to adapt their study tactics accordingly **(Alloway et al., 2010).**

Table 4.5.7 showing comparison of study habit of study groups.

Table 4.5.7 : Comparison of Study Habit of Study Groups

Study Habit	N	Mean	Std. Deviation	Mean Difference	't' score	p value
Boys with Low Verbal working memory	13	64.385	7.752	5.901	3.407	0.001
Boys with Average	63	70.286	5.191			

Study Habit	N	Mean	Std. Deviation	Mean Difference	't' score	p value
Verbal working memory						
Boys with Low Verbal working memory	13	64.385	7.752	14.157	5.904	0.000
Boys with High Verbal working memory	24	78.542	6.514			
Boys with Average Verbal working memory	63	70.286	5.191	8.256	6.168	0.000
Boys with High Verbal working memory	24	78.542	6.514			
Girls with Low Verbal working memory	25	65.760	9.230	10.085	6.114	0.000
Girls with Average Verbal working memory	58	75.845	5.628			
Girls with Low Verbal working memory	25	65.760	9.230	15.828	5.792	0.000
Girls with High Verbal working memory	17	81.588	7.819			
Girls with Average Verbal working memory	58	75.845	5.628	5.743	3.372	0.001
Girls with High Verbal working memory	17	81.588	7.819			
Boys with Low Verbal working memory	13	64.385	7.752	1.375	0.459	0.649
Girls with Low Verbal working memory	25	65.760	9.230			
Boys with Average Verbal working memory	63	70.286	5.191	5.559	5.652	0.000
Girls with Average Verbal working memory	58	75.845	5.628			
Boys with High Verbal working memory	24	78.542	6.514	3.047	1.358	0.182

Study Habit	N	Mean	Std. Deviation	Mean Difference	't' score	p value
Girls with High Verbal working memory	17	81.588	7.819			

Table 4.5.7 shows that the mean study habit scores for boys with low verbal working memory are 64.385 and the mean study habit scores for boys with average verbal working memory are 70.286. The difference in mean was 5.901 and 't' score was 3.407 and it is significant at 0.01 level ($p=0.001$; $p<0.01$). It indicates that a significant difference is present in the study habits among boys with low and average verbal working memory. Furthermore, mean score reflects that boys with average verbal working memory have better study habits in comparison to boys with low verbal working memory.

Table 4.5.7 illustrates that the mean study habit scores for boys with low verbal working memory are 64.385 and the mean study habit scores for boys with high verbal working memory are 78.542. The average difference was 14.157 and 't' score was 5.904 and it is significant at 1% level ($p=0.000$; $p<0.01$), which infers a significant difference is there in the study habits between boys with low and high verbal working memory. Furthermore, mean score reflects that boys with high verbal working memory have better study habits in comparison to boys with low verbal working memory.

Table 4.5.7 exhibits that the mean study habit scores for boys with average verbal working memory are 70.286 and the mean study habit scores for boys with high verbal working memory are 78.542. The average difference was 8.256 and 't' score was 6.168 and it is significant at 1% level ($p=0.000$; $p<0.01$). It indicates that there exists a significant difference in study habits among boys with average and high verbal working memory. Additionally, mean score reflects that boys with high verbal working memory have better study habits to boys with average verbal working memory.

Table 4.5.7 shows that the mean study habit scores for girls with low verbal working memory are 65.760 and the mean study habit scores for girls with average verbal working memory are 75.845 The difference in mean was 10.085 and 't' score was 6.114 and it is significant at 1% level ($p=0.000$; $p<0.01$). It infers that a significant difference is present in study habits among girls with low and average verbal working memory. Furthermore, mean score reflects that girls with average verbal working memory have better study habits in comparison to girls with low verbal working memory.

Table 4.5.7 illustrates that the mean study habit scores for girls with low verbal working memory are 65.760 and the mean study habit scores for girls with high verbal working memory are 81.588. The difference in mean was 15.828 and 't' score was 5.792 and it is significant at 1% level ($p=0.000$; $p<0.01$), which infers that there exists a significant difference in study habits amongst girls with low and high verbal working memory. Additionally, mean score reflects that girls with high verbal working memory have better study habits in comparison to girls with low verbal working memory.

Table 4.5.7 exhibits that the mean study habit scores for girls with average verbal working memory are 75.845 and the mean study habit scores for girls with high verbal working memory are 81.588. The average difference was 5.743 and 't' score was 3.372 and it is significant at 1% level ($p=0.001$; $p<0.01$). It infers that a significant difference is present in the study habits among girls with average and high verbal working memory. In addition to above, mean score reflects that girls with high verbal working memory have better study habits in comparison to girls with average verbal working memory.

Table 4.5.7 shows that the mean study habit scores for boys with low verbal working memory are 64.385 and the mean study habit scores for girls with low verbal working memory are 65.760. The difference in mean was 1.375 and 't' score was 0.459 and it is not significant at 0.05 level ($p=0.649$; $p>0.05$), which infers that no significant difference exists in the study habits among boys and girls with low verbal working

memory. Moreover, mean score reflects that girls with low verbal working memory and boys with low verbal working memory have similar study habits.

Table 4.5.7 shows that the mean study habit scores for boys with average verbal working memory are 70.286 and the mean study habit scores for girls with average verbal working memory are 75.845. The difference in mean was 5.559 and 't' score was 5.652 and it is significant at 1% level ($p=0.000$; $p<0.01$). It infers that a significant difference exists in the study habits among boys and girls with average verbal working memory. Furthermore, mean score reflects that girls with average verbal working memory have better study habits in comparison to boys with average verbal working memory.

Table 4.5.7 shows that the mean study habit scores for boys with high verbal working memory are 78.542 and the mean study habit scores for girls with high verbal working memory are 81.588. The difference in mean was 3.047 and 't' score was 1.358 and it is insignificant at 0.05 level ($p=0.182$; $p>0.05$). It infers no significant difference is there in the study habits among boys and girls with high verbal working memory. Additionally, mean score reflects that girls with high verbal working memory and boys with high verbal working memory have similar study habits.

Table 4.5.8 : Association between Gender and Study Habits

		Study Habit		Total	Chi Square
		Below Average	Above Average		(p value)
Boys	f	55	45	100	5.123
	%	55.0%	45.0%	100.0%	0.023
Girls	f	39	61	100	
	%	39.0%	61.0%	100.0%	
Total	f	94	106	200	
	%	47.0%	53.0%	100.0%	

Table 4.5.8 shows that out of total boys, 55 % boys are having study habits below average while rest of 45 % boys are having study habits above average. While out of total girls, 39 % girls are having study habits below average while rest of 61 % girls are having study habits above average. The chi-square value is 5.123 and it is

significant at 0.05 level ($p=0.023$; $p<0.05$). It indicates that a significant difference exists in the study patterns and routines of boys and girls.

This may be because learning styles and preferences vary between males and females, which can have an effect on the way in which they choose to study. For instance, females may lean more towards collaborative learning or prefer calm and concentrated study situations, whereas boys may participate in more active or hands-on learning ways **(Gurian, 2011)**. Moreover, girls may prefer to learn in environments that are less distracting than those in which boys learn.

Girls often exhibit greater self-regulation abilities than boys, including the ability to create and achieve objectives, successfully manage time, and consistently practise strict study habits. According to **Zimmerman (2002)**, these abilities contribute to more organised and more effective study habits.

Table 4.5.9 showing association between levels of verbal working memory and study habits.

Table 4.5.9 : Association between Levels of Verbal working memory and Study Habits

		Study Habit		Total	Chi Square
		Below Average	Above Average		(p value)
Low Verbal working memory	F	31	7	38	35.483
	%	81.6%	18.4%	100.0%	0.000
Average Verbal working memory	F	57	64	121	
	%	47.1%	52.9%	100.0%	
High Verbal working memory	F	6	35	41	
	%	14.6%	85.4%	100.0%	
Total	F	94	106	200	
	%	47.0%	53.0%	100.0%	

Table 4.5.9 shows that out of total students with low verbal working memory, 81.6 % students are having below average study habits while the rest of 18.4 % students are having study habits which can be categorized as above average.

Table 4.5.9 reflects that out of total students with average verbal working memory, 47.1 % students with average verbal working memory are having study habits below average while rest of 52.9 % students with average verbal working memory are having study habits above average.

Table 4.5.9 demonstrates that out of total students with high verbal working memory, 14.6 % students with high verbal working memory are having study habits below average while rest of 85.4 % students with high verbal working memory are having study habits above average.

The chi-square value is 35.483 and it is is significant at 1% level ($p=0.000$; $p<0.01$). It deduces that there exist significant differences in the study habits of students with different levels (low/average/high) of verbal working memory. This has also been the findings in several studies according to which, children who have varying degrees of verbal working memory may demonstrate a variety of alternative approaches to learning. Students with higher verbal working memory capacity may have better study habits overall, as opposed to those students who have a lower capacity overall. This can be because students with larger verbal working memory capacity are better equipped to organise and integrate verbal knowledge, which makes it simpler for them to recognise links between concepts and effectively synthesise material. According to **Alloway et al. (2010)**, having this capacity enables students to easily build structured study schedules and make connections between various kinds of knowledge. Also, students that have a larger capacity for keeping verbal knowledge in their working memory may have superior encoding and retention skills for verbal information. According to **Alloway et al. (2010)**, this indicates that they are better able to remember and retrieve knowledge that is pertinent to language-based subjects such as reading, writing, and foreign languages.

Table 4.5.10 : Correlation between Verbal working memory and Study Habit

	Coefficient of Correlation	p value
Boys (N = 100)	0.722	0.000
Girls (N = 100)	0.735	0.000
Total Sample (N = 200)	0.684	0.000

Table 4.5.10 displays that coefficient of correlation among verbal working memory and study habit is 0.722 and it is significant at 1% level for boys ($p=0.000$; $p<0.01$). It suggests that there exists a significant positive correlation between verbal working memory and study habits for boys. It infers that study habit improves with increase in verbal working memory and vice versa for boys.

Table 4.5.10 displays that the coefficient of correlation among verbal working memory and study habit is 0.735 and it is significant at 1% level for girls ($p=0.000$; $p<0.01$). It indicates that a significant positive correlation exists between verbal working memory and study habit for girls. It infers that study habits increases with increase in verbal working memory and vice versa for girls.

Table 4.5.10 exhibits that the coefficient of correlation among verbal working memory and study habit is 0.684 and it is significant at 1% level for total sample ($p=0.000$; $p<0.01$). It suggests that a significant positive correlation is there between verbal working memory and study habit for total sample. It infers that study habits increases with increase in verbal working memory and vice versa for total sample.

4.6 Hypothesis testing

On the basis of the above analysis:

The hypothesis ***"There is no significant difference in achievement motive between boys and girls"*** has **failed to be accepted** as the difference was found between achievement motivation of boys and girls (Table 4.3.4, Table 4.3.5 & Table 4.3.8).

The hypothesis ***"There is no significant difference in academic performance between boys and girls"*** has **failed to be accepted** as the difference was found between academic performance of boys and girls (Table 4.4.4, Table 4.4.5 & Table 4.4.8).

The hypothesis ***"There is no significant difference in study habit between boys and girls"*** has **failed to be accepted** as the difference was found between study habit of boys and girls (Table 4.5.4, Table 4.5.5 & Table 4.5.8).

The hypothesis ***"There is no significant effect of verbal working memory on achievement motive"*** has **failed to be accepted** as the difference was found between achievement motivation of boys and girls (Table 4.3.4, Table 4.3.6 & Table 4.3.9).

The hypothesis ***"There is no significant effect of verbal working memory on academic performance"*** has **failed to be accepted** as the difference was found between academic performance of boys and girls (Table 4.4.4, Table 4.4.6 & Table 4.4.9).

The hypothesis ***"There is no significant effect of verbal working memory on study habit"*** is **rejected** as the difference was found between study habit of boys and girls (Table 4.5.4, Table 4.5.6 & Table 4.5.9).

The next chapter is related with conclusion and suggestions.