CHAPTER-4

RESULTS

The chapter presents the findings of the study in two parts, quantitative and qualitative findings. The quantitative part deals with the statistical analysis of the data collected through the tools formulated in the study. The results of data normalcy testing, testing of differences in the mean scores of test-takers based on their demographic characteristics, and the effect of these demographic factors on the scores of the respondents have been reported in this chapter. In the second part, the qualitative results have been presented in the chapter to explain the theme-wise findings obtained through the interviews conducted during the fieldwork.

4.1 Quantitative Data Analysis

Large data tends to distribute itself in the form of a curve and this data can be based on a natural phenomenon, which could be both physical and psychological. Normal or approximately normal distribution of data facilitates clear interpretation. To carry out parametric analysis, especially inferential statistics, the data must be normally distributed along with the fulfilment of certain assumptions as scientific parameters such as homogeneity, objectivity, scientific randomisation, and independent observation. Nevertheless, a perfect normal distribution is impossible, but distribution with acceptable Skewness and Kurtosis values is considered to be normal. It is important to understand that, "normal distribution does not exist. It is not a fact of nature. Rather it is a mathematical model-an idealization-that can be used to represent data collected in behavioral research" (Shavelson, 1996).

In the present study, the normal distribution of data was checked by drawing the Normal Probability Curve (NPC) for teachers' performance on the Teachers'

Professionalism Scale and also for students' performance on mathematics and science achievement tests. SPSS Version 22 was used to analyze the data.

4.1.1 Normal Distribution of Data

The graph in Figure 5 is a representation of the distribution of the data collected from teachers on the Teacher Professionalism Scale. The number of observations (N) is 195, with a Mean Score of 96.27 and a Standard Deviation of 17.172.

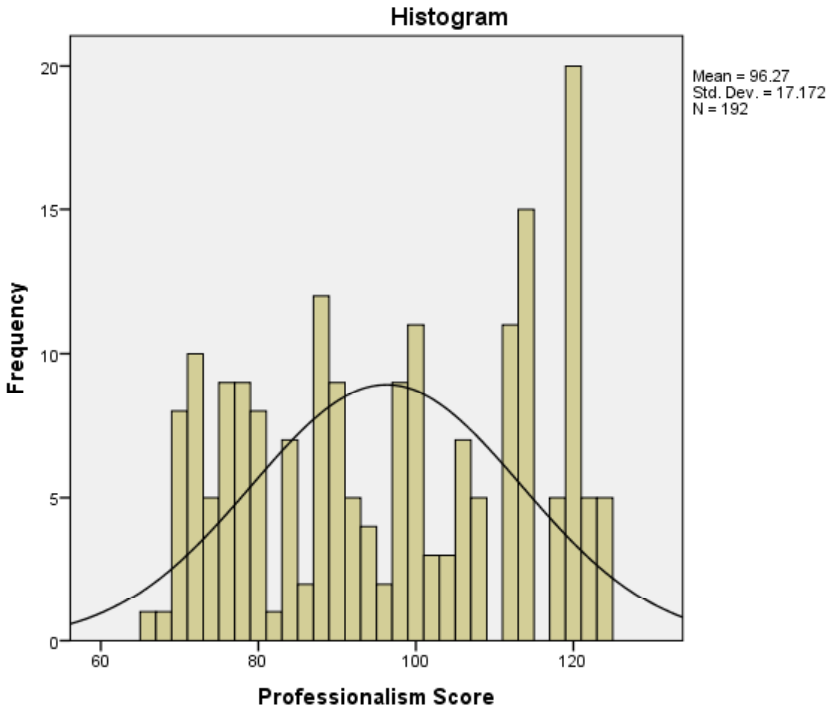


Figure 6: Normal Probability Curve for teacher professionalism scores

The mean score of students on the mathematics achievement test was 18.50 out of a total of 52 marks with S.D. 11.860. The mean score of students on the science achievement test was 20.05 out of 48 marks with S.D. 13.117. The NPC for both datasets can be seen in Figure 6.

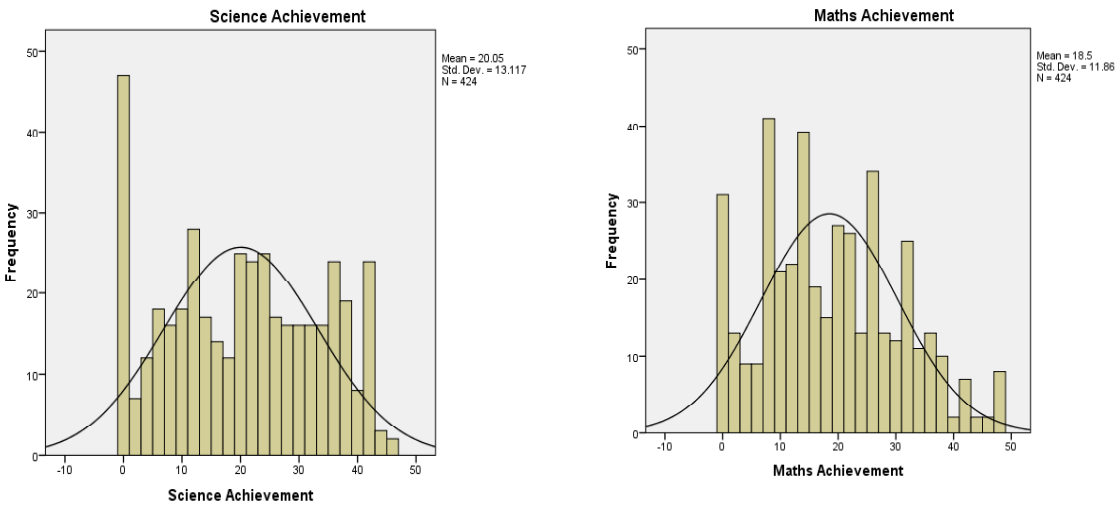


Figure 7: Normal Probability Curve for Mathematics and Science Achievement of students

Skewness refers to the case where the observations are more concentrated. The concentration can be either in the left or the right side. Kurtosis refers to the distribution or concentration of scores near the tails of the curve (Westfall, 2014). It signifies the presence of large numbers of outliers. The acceptable range of Skewness and Kurtosis is +2 and -2 (Gravetter & Wallnau, 2014; Trochim & Donnelly, 2006; Field, 2000 & 2009). In the present study, the values of Skewness and Kurtosis as can be seen in Table 9 fall under the acceptable range for all the three datasets confirming the normalcy of the data.

Table 9: Skewness and Kurtosis for teacher and student data

	N	**Skewness**	**Kurtosis**
Mathematics Achievement	424	0.337	-.645
Science Achievement	424	0.026	-1.179
Teacher Professionalism	192	-0.029	-1.326

OBJECTIVE 1: To examine the differences in teacher professionalism across various demographic characteristics such as gender, highest degree, age, experience, job description, annual income, and teacher training at the secondary school level.

The researcher used the Independent Sample t-test to examine the difference in the Professionalism scores of teachers based on their gender. The demographic gender consisted of two groups, i.e., the male and the female teachers. For other demographic characteristics, the assessment was done using ANOVA as they consisted of more than two categories/demographic characteristics. Table 10 depicts that the differences in the scores of male and female teachers were not found to be significant.

Table 10: Gender and degree wise Mean, S.D. and t-value/F-value for teacher professionalism scores

Demographics	**Category**	**N**	**Mean**	**S.D.**	**t-value/F-value**
Gender	Male	98	87.22	13.605	
	Female	94	87.86	9.217	0.38
Academic Qualification	Bachelors	67	85.74	9.709	
	Masters	115	87.29	12.081	0.32
	M.Phil.	5	87.32	13.093	
	Ph.D.	5	87.98	13.785	

**p< 0.01 level; *p<.05 level

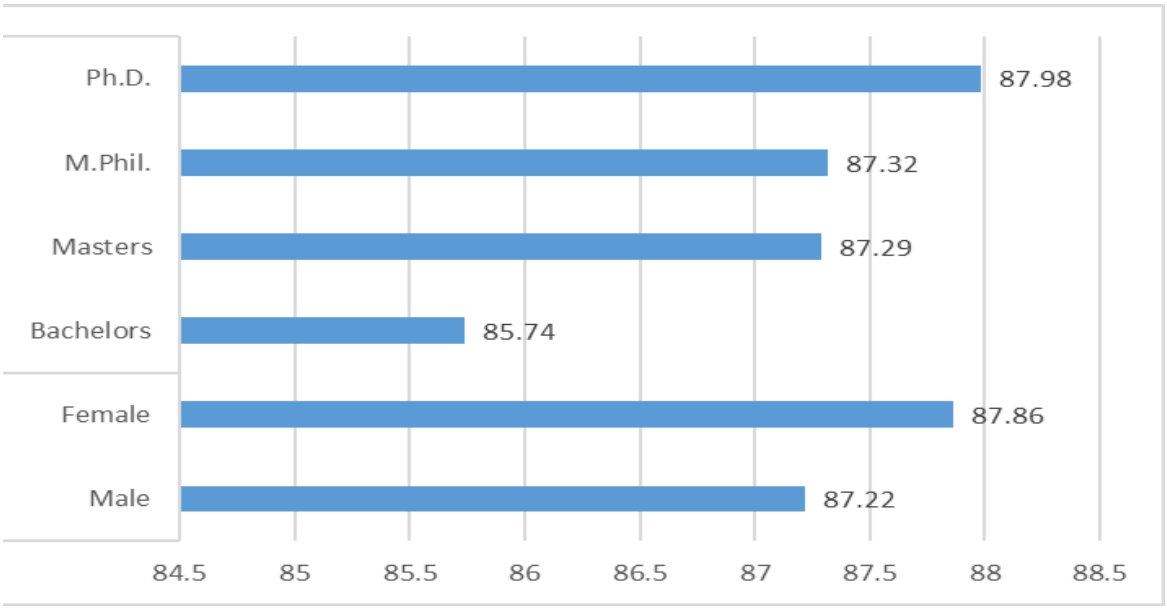


Figure 8: Graph representing gender and degree wise mean scores of teachers

Also, there was no significant difference in the professionalism scores of teachers based on the highest degree they possessed. This depicts that the differences in the mean scores of these groups are an occurrence due to chance/sampling.

Since demographic characteristics namely highest degree, age, experience, degree, job designation, highest professional training, and annual income, had more than two categories, Analysis of Variance (ANOVA) was used to assess the significance of the difference in teacher professionalism scores across the categories. No significant difference was found in the professionalism scores of teachers across the age groups taken into consideration in the current research (Table 11). The results depict that there is a significant difference between the professionalism scores of teachers across the categories of years of experience. Whenever ANOVA results are significant, it is considered that there exists a significant difference between the scores of at least two groups/categories under the demographic/variable.

To analyze the specific patterns of differences between the means ANOVA is often followed by individualistic comparisons using the post hoc tests (Salkind, 2010). This

is a pair-wise comparison technique developed by Tukey named *'Honestly Significant Difference (HSD)'*. The researcher used the Tukeys' Post-hoc Test or the HSD to identify the exact groups having a significant difference in their means after getting significant results of ANOVA.

Table 11: Demographic category wise Mean, S.D., and F-value of teacher professionalism scores

Demographics	**Category**	**N**	**M**	**S.D.**	**F-value**
Age	25-35 years	43	85.49	13.518	0.611
	36-45 years	42	88.52	12.292	
	46-55 years	61	87.75	10.517	
	56 years and above	46	88.26	10.586	
Experience	0-10 years	78	84.69	12.808	4.434*
	11-20 years	30	86.33	10.087	
	21-30 years	53	89.68	11.318	
	31-40 years	31	92.48	7.509	
Job Description	Assistant Teacher	30	85.5	7.906	13.2**
	TGT	35	96.14	3.655	
	PGT	127	85.67	12.138	
Annual Income	Upto 3 Lakhs	30	80.70	12.143	10.131**
	4- 6 Lakhs	89	86.74	11.817	
	7-10 Lakhs	73	91.36	9.35	
Professional Qualification	Untrained	22	86.5	5.382	1.646
	Diploma	30	87	7.379	
	B.Ed.	105	87.2	11.948	
	M.Ed.	35	94	6.325	

**p< .001 level; *p<.05 level

For the demographic teachers' experience, the results of Tukeys' Post-hoc Test clarify that the score of teachers possessing less than 10 years of experience is significantly less than the scores of teachers possessing 31-40 years of experience at the 0.05 level. The demographic Job Description refers to the designation on which the teachers were hired. Job Description differs based on the teachers' qualifications, training, and experience. The category-wise mean scores of teachers have been depicted in Figure 9. The distribution of work did not differ according to the post in most schools. Three categories of the job description of secondary teachers emerged from the collected data. The results of the Analysis of Variance reveal that the professionalism scores of teachers across the designations they held differed significantly at the 0.01 level. Tukeys' Post-hoc Test was administered to identify the exact pairs that differed and it was found that the professionalism scores of Assistant teachers and TGT teachers differed significantly and the professionalism scores of Assistant teachers and PGT teachers differed significantly. There was no significant difference in the professionalism scores of TGT and PGT teachers.

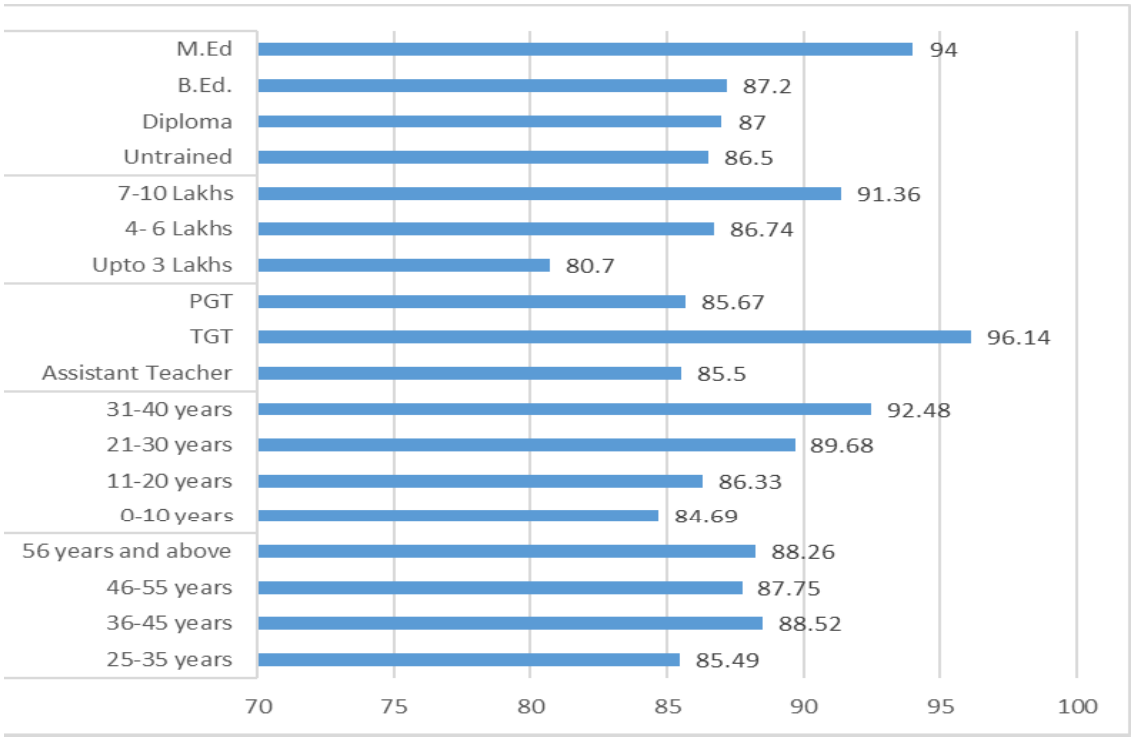


Figure 9: Graph representing age, experience, job description, annual income, and training wise mean scores of teachers

The Annual Income of the teachers was recorded as the approximate yearly income of the teachers categorized in three groups as shown in Table 10. The t-value is significant at the 0.01 level which implies that there exists a significant difference in the Professionalism of teachers based on their annual income. Tukey's Post-hoc Test results found that Professionalism scores of teachers having an annual income of less than 3 lakhs differed significantly from teachers in the income groups 4-6 Lakhs and above 6 Lakhs at the 0.01 level. There was a significant difference in scores of teachers in the groups 4-6 Lakhs and above 6 Lakhs at the 0.05 level. ANOVA results for teachers' Professionalism scores categories based on their highest training qualification found that there was no significant difference between the Professionalism of untrained teachers, teachers having a Diploma, Bachelors in Education and Masters in Education.

OBJECTIVE 2: To assess the differences in students' achievement across various demographic characteristics such as gender, preschool, tuition, board at the secondary school level.

t-test was used to identify the differences in the cognitive abilities of students across the board to which the students' schools were affiliated; gender of students; preschool and enrolment in tuition. Differences in the achievement of students based on the board their schools are affiliated with were explored. The category-wise mean scores of students have been depicted in Figure 10. The results of the t-test can be observed in Table 12 which depicts that the achievement scores of students differed significantly based on the school board, students' gender, completion of preschool, and tuition.

Table 12: Demographic category wise Mean, S.D., and t-value of students' achievement scores

Demographics	**Category**	**N**	**M**	**S.D.**	**t-value**
Board	RBSE	270	26.26	16.471	21.841**
	CBSE	154	60.11	14.669	
Gender	Male	145	22.35	16.002	13.435**
	Female	279	46.97	21.082	
Preschool	Attended	211	51.7	20.039	14.491**
	Did not Attend	213	25.53	17.012	
Tuition/Coaching	Yes	210	25.01	16.843	15.078**
	No	214	51.84	19.705	

**p< .001 level; *p<.05 level

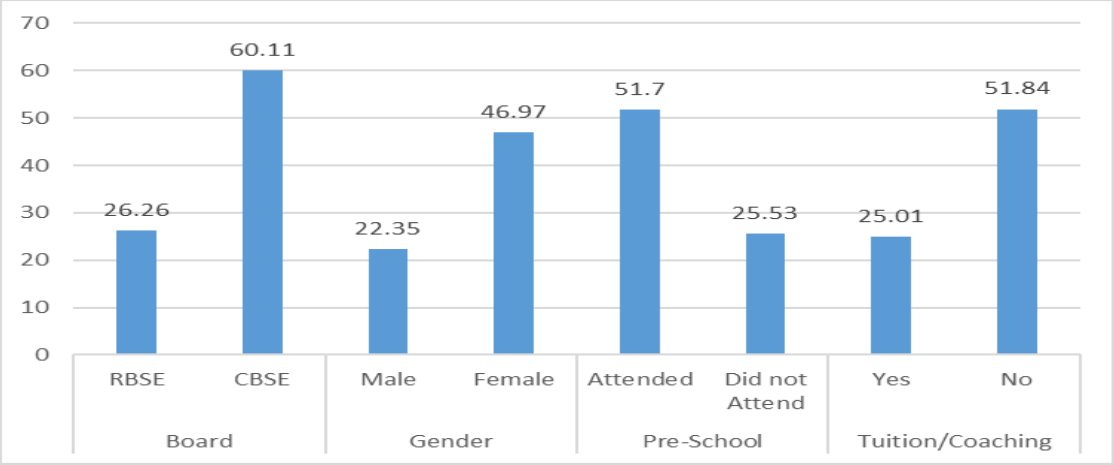


Figure 10: Graph representing board, gender, pre-school and tuition category wise mean scores of students

To understand the difference in the achievement of students caused by preschool, the significance of the difference between the mean scores of students who attended preschool and students who did not attend preschool was assessed. The difference was found to be significant at the 0.01 level. Similarly, to assess the difference in the cognitive abilities of students caused by taking private tuition classes, t-test was used. The results revealed that there is a significant difference in the achievement of students.

After computing the significance of the difference in the mean scores of students on the combined scores of mathematics and science (Student Achievement), the researcher calculated the average performance of students in both the subjects separately and also computed the significance of the difference in the scores of students belonging to the categories of demographics under study. The results have been depicted in Table 13.

Table 13: Demographic category wise mean, S.D. and t-value of scores of students in mathematics and science

		Mathematics (52 Marks)			Science (48 Marks)		
Demographic	**Category**	**Mean Score**	**S.D.**	**t-value**	**Mean Score**	**S.D.**	**t-value**
Gender	Male	10.51	7.657	12.939**	11.84	10.401	10.977**
	Female	22.66	11.534		24.32	12.343	
Preschool	Attended	25.34	10.85	14.390**	36.36	12.298	11.220**
	Did not Attend	11.73	8.457		13.8	10.703	
Tuition/Coaching	Yes	11.69	8.216	14.291**	13.33	10.707	12.138**
	No	25.19	11.061		26.65	11.871	
Board	Public	11.42	8.193	16.599**	13.16	10.43	13.706**
	Private	26.44	10.194		27.78	11.419	

**p< .001 level; *p<.05 level

The average scores suggest that female students outperformed male students in both Mathematics and Science. Students who have completed preschool education also scored better than students who did not go to preschool in both subjects. Students who do not take tuitions performed better than students who took tuitions and students of private schools performed better than students belonging to public school in both subjects. The t-test results indicate that the differences in the groups was significant at 0.01 level across all the demographic variables. Figure 11 depicts the graphical representation of the mean scores of students across the demographic characteristics.

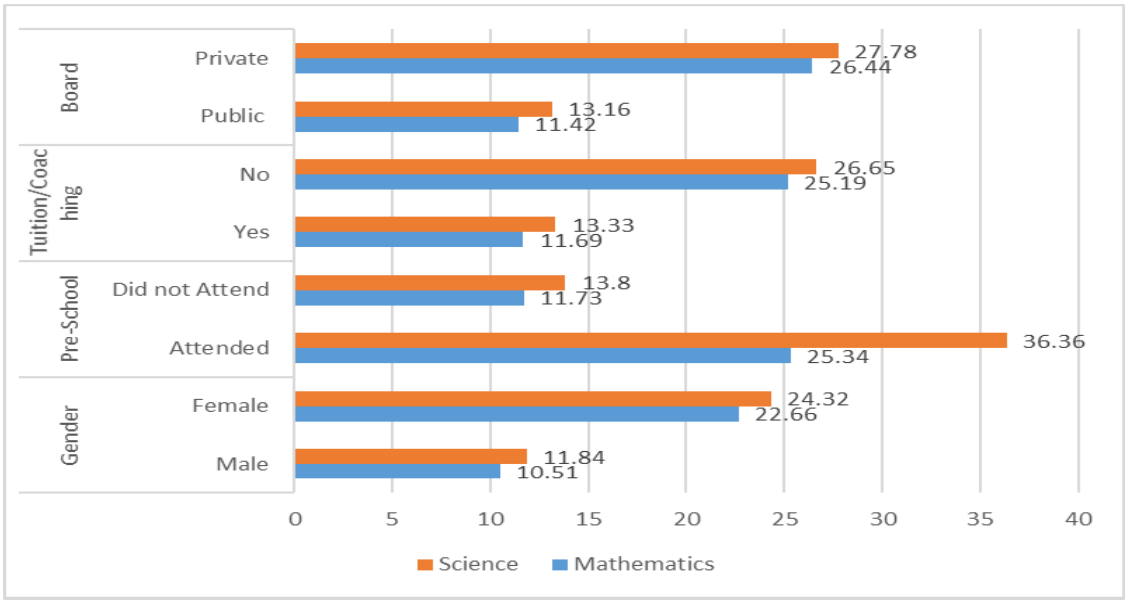
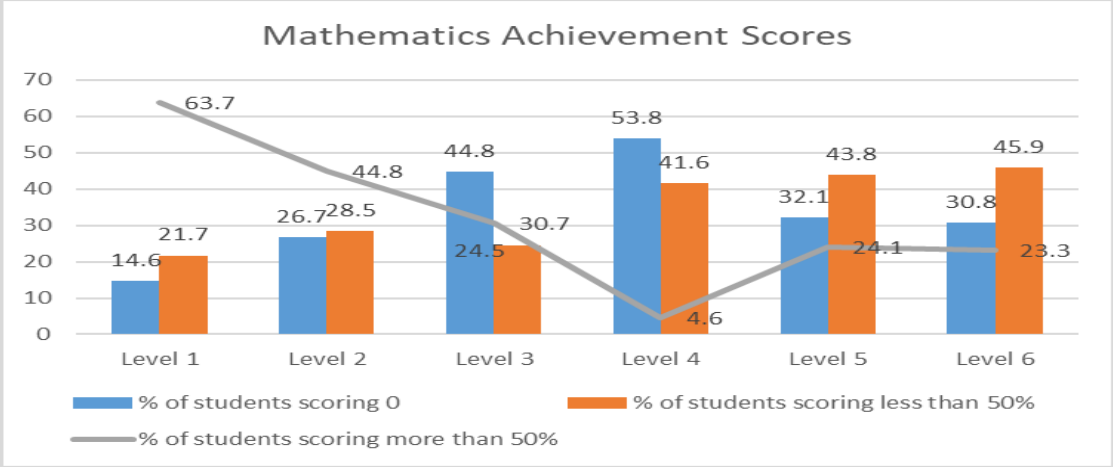


Figure 11: Graph representing gender, pre-school, tuition and board category wise mean scores of students in mathematics and science

Level-wise analysis of students' performance was computed for both subjects where the percentage of students scoring zero; percentage of students scoring less than 50% and percentage of students scoring more than 50% was calculated. Figure 12 depicts the results of the Mathematics Achievement Test. It can be observed that the percentage of students scoring more than 50 percent on each level decreases drastically from level 1 to level 4 and then registers a slight improvement through level 5 and level 6. Similarly, it can also be observed that the number of students scoring 0 becomes more than the percentage of students scoring less than 50% at levels 3 and 4 and increases again at levels 5 and level 6.



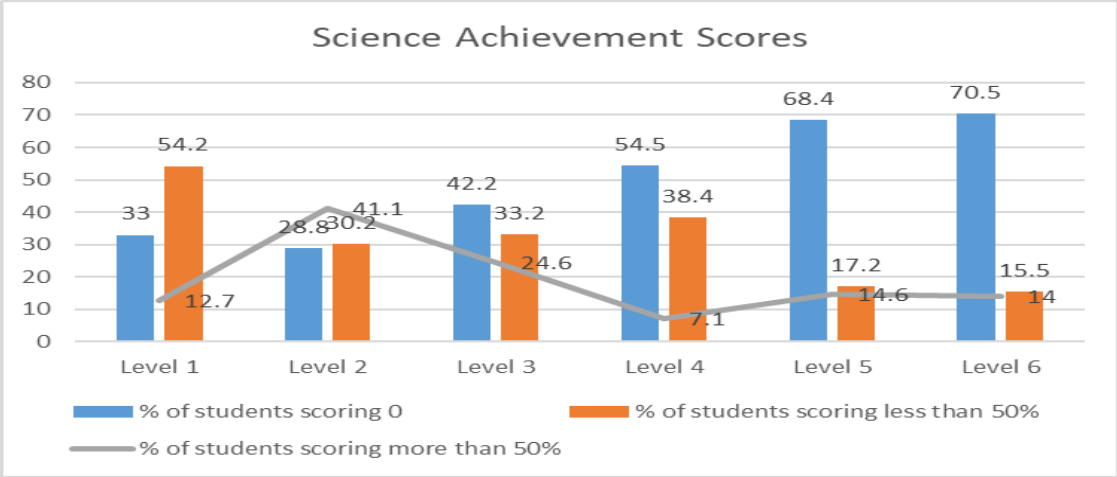


Figure 12: Graphs representing level wise mean scores of students in mathematics and science

Similarly for Science Achievement Test, in Figure 12 it can be observed that that the students found level 2 to be easier than level 1 since the percentage of students scoring more than 50% increases, and at the same time percentage of students scoring zero or less than 50% decreases. The percentage of students scoring more than 50% again falls after level 2 and drops drastically at level 4 thereby increasing the percentage of students scoring a zero. A slight increase in the percentage of students scoring above 50% is seen at level 5 which is maintained at level 6.

OBJECTIVE 3: To analyse the effect of gender, highest degree, age, experience, job description, annual income, and teacher training on teacher professionalism, and the effect of gender, preschool, tuition, and board on the achievement of students at the secondary school level.

The demographic profile of teachers who participated in the study has been recorded in Table 14. To assess the effects of teacher characteristics on teacher professionalism, regression was used. Since the predictors to be assessed were more than one, Multiple regression was computed.

Table 14: Demographic profile of teachers who participated in the study

Demographics	Category	N	%
Gender	Male	98	51.04
	Female	94	48.96
Highest Degree	Bachelors	67	58.9
	Masters	115	34.3
	M. Phil.	5	2.5
	Ph. D.	5	2.5
Age	25-35 years	43	22.40
	36-45 years	42	21.88
	46-55 years	61	31.77
	56 years and above	46	23.96
Experience	0-10 years	78	40.63
	11-20 years	30	15.63
	21-30 years	53	27.60
	31-40 years	31	16.15
Job Description	Assistant Teacher	30	15.63
	TGT	35	18.23
	PGT	127	66.15
Annual Income	Up to 3 Lakhs	30	15.63
	4- 6 Lakhs	89	46.35
	7-10 Lakhs	73	38.02
Professional Qualification	Untrained	22	11.46
	Diploma	30	15.63
	B.Ed.	105	54.69
	M.Ed.	35	18.23

Before proceeding with the regression analysis, correlation between the predictor and dependent variables was checked to confirm that all the predictor variables are correlated to the dependent variable so that they can be added to the regression model.

Variables that are not correlated do not generate coefficients in the regression model and are eliminated from the analysis. The results of the correlation analysis depicted in Table 15 reveal that all the predictor variables and the dependent variable are correlated, therefore, all the predictor variables can be added to the regression model. Job description, experience, annual income and highest degree are significantly correlated with the teacher professionalism scores.

Table 15: Correlation between teacher demographic characteristics and teacher professionalism score

		Gender	**Age**	**Job Description**	**Experience**	**Annual Income**	**Academic Qualification**	**Professional Qualification**	**Professionalism**
Gender	Pearson Correlation	1							
	Sig. (2-tailed)								
Age	Pearson Correlation	**.265****	1						
	Sig. (2-tailed)	.000							
Job Description	Pearson Correlation	**-.235****	-.027	1					
	Sig. (2-tailed)	.001	.708						
Experience	Pearson Correlation	**.271****	**.710****	**-.289****	1				
	Sig. (2-tailed)	.000	.000	.000					
Annual Income	Pearson Correlation	**.350****	**.710****	**-.173***	**.739****	1			
	Sig. (2-tailed)	.000	.000	.016	.000				
Academic Qualification	Pearson Correlation	.093	**-.222****	-.096	-.079	-.062	1		
	Sig. (2-tailed)	.195	.002	.182	.274	.387			
Professional Qualification	Pearson Correlation	.002	**-.172***	.067	-.002	-.102	.060	1	
	Sig. (2-tailed)	.982	.016	.355	.976	.158	.405		
Professionalism	Pearson Correlation	.027	.069	**-.209****	**.254****	**.310****	**.162***	.049	1
	Sig. (2-tailed)	.705	.336	.003	.000	.000	.023	.492	

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

*. significant at the 0.05 level (2-tailed).

Multiple regression was used to analyze the effect of the demographic characteristics of teachers on their professionalism scores. All the predictors were categorical variables where the first category in all the variables was by default considered to be the reference category and the coefficients for other categories were calculated accordingly.

A significant regression equation emerged where,

$$(F\ (14, 178) = 4.89, p<.01)$$

The power of the regression model was 30.53 which implies that the independent variables predict a 30.53% change in the dependent variable. The results in Table 16 portray that male teachers' score was 3.112 units less than female teachers on the professionalism scale, but this prediction was not significant to be generalized.

Table 16: Multiple regression results for effects of teacher demographic characteristics on teachers' professionalism scores

TP_Score	Coef.	Std. Err.	t	p > |t|	Tolerance	VIF
Gender						
Male (Ref.)						
Female	-3.112	.670	-1.863	0.064	.824	1.213
Experience						
0-10 years (Ref.)						
11-20 years	-0.78	2.694	-0.29	0.77		
21-30 years	2.23	2.78	0.80	0.42		
31-40 years	2.38	3.91	0.61	0.54	.325	3.074
Acad. Qualification						
Bachelors (Ref.)						
Masters	0.299	2.08	0.24	0.886		
M.Phil.	7.92	2.24	1.43	0.154		
Ph. D.	**12.79**	5.71	2.24	0.026	.911	1.097
Job Description						
Assistant Teacher (Ref.)						
TGT	4.805	4.09	1.17	0.243		
PGT	-2.95	3.78	-0.79	0.43	.796	1.256
Professional Degree						
B.Ed. (Ref.)						
M.Ed.	**8.51**	3.77	2.25	0.025		
Untrained	2.04	1.13	0.45	0.75		
Diploma	5.47	3.62	1.51	0.133	.915	1.093
Annual Income						
Below 3 Lakhs (Ref.)						
3-6 Lakhs	**16.49**	3.5	4.71	0.00		
Above 6 lakhs	**20.37**	4.3	4.73	0.00	.365	2.741
Age Group						
25-35 years (Ref.)						
36-45 years	**-6.55**	3.26	-2.01	0.046		
46-55 years	**-11.35**	3.62	-3.13	0.002		
56 years and above	**-9.46**	3.96	-2.39	0.018	.348	2.873
Constant	81.1	4.25	19.06	0.00		

* . significant at the 0.05 level.
**. significant at the 0.01 level.

For years of experience as a predictor it can be observed that as compared to reference category (0-10 years of experience) the scores of teachers first decrease and then increase in the later years of service, however, teachers' experience was not found to be a significant predictor of professionalism. The results exhibit that as compared to teachers possessing a bachelor's degree, the professionalism scores of teachers possessing a master's degree are negligibly high. A higher academic degree contributes towards an increase in professionalism scores of teachers but only teachers possessing a Ph.D. degree show a significant increase in professionalism (12.79 scores) as compared to teachers possessing a B.Ed. degree. The predictor job

description does not contribute significantly to the professionalism of teachers. With respect to the professional qualifications of teachers, it was found that teachers possessing M. Ed. performed significantly better than the teachers possessing B. Ed, with M. Ed. teachers scoring 8.51 scores more than B.Ed. teachers.

The annual income of teachers emerges as the most significant predictor of professionalism of teachers, with higher income predicting higher professionalism. Teachers earning between 3-6 Lakhs per annum score 16.49 units more than teachers earning less than 3 lakhs in a year. Similarly, teachers with annual income above 6 lakhs score 20.37 units more than teachers earning less than 3 lakhs a year. Teachers' age was also found to be a significant predictor of professionalism. Teachers aged between 25-35 years scored significantly more than older teachers, with teachers in the age group 46-55 years scoring 11.35 units less than the reference category (25-35 years).

The researcher used collinearity diagnostics proposed by Belsley, Kuh, and Welsch (2005) to identify if any of the independent variables in the models were causing multicollinearity. The method produces a Tolerance Index for each independent variable used in the regression. In regression, error terms can get enlarged due to collinearity to such an extent that the coefficients do not remain significant (Berry, 1993). Therefore, Collinearity Statistics Tolerance Index gives clarity by identifying the independent variables that are highly correlated and are affecting the significance of their effects and weakening the analysis. When variables display collinearity, it signifies that the variables contain redundant information and are not needed in the analysis. When correlations between the variables are more than 0.90 there are chances that the variables are causing collinearity and deleting one of the variables solves the problem of collinearity.

In the current research, the collinearity tolerance index was generated to check whether any independent variables were causing collinearity. According to Allison (1999), there is no strict cutoff range for tolerance but Weisburd & Britt (2014) have claimed that a tolerance index below 0.20 suggests serious collinearity issues in a regression model. Similarly, VIF (Variance Inflation Factor) is also generated along with tolerance index while running multicollinearity checks. The VIF values above 4 along with tolerance below 0.20 are considered to be indicating collinearity in the model. In the model generated none of the predictor variables have a tolerance index of less than 0.20 and VIF values are also below 4 which implies that there are no serious collinearity problems in the regression model.

Autocorrelation refers to the degree to which there is a correlation between the values of a variable across various observations (Field, 2009). Autocorrelation is mostly used with time series data but can also be used with cross-sectional data. In cross-sectional data, autocorrelation can occur when observations/participants are related in some way. For example, students of the same school or geographical location can answer similarly on test items than students belonging to different schools or geographical locations. The researcher used the Durbin-Watson Test to check the degree of autocorrelation in the data. Field (2009) suggests that Durbin-Watson values less than 1 or more than 3 are a definite source of concern. The Durbin-Watson value for the dataset used in the present study was found to be 1.702 which falls within the ideal range of values for the measure.

Lastly, it is important to check homoscedasticity in data, i.e., the distribution of residuals should be equally distributed above and below zero (Woolridge, 2012). Homoscedasticity can be checked through a p-p plot and scatterplot. The graph in Figure 13 represents the Predicted Probability Distribution and depicts that the data is

normally distributed. It can be observed in the scatterplot in Figure 13 that the residuals are almost equally distributed near the line. This indicates that the data is free of heteroscedasticity.

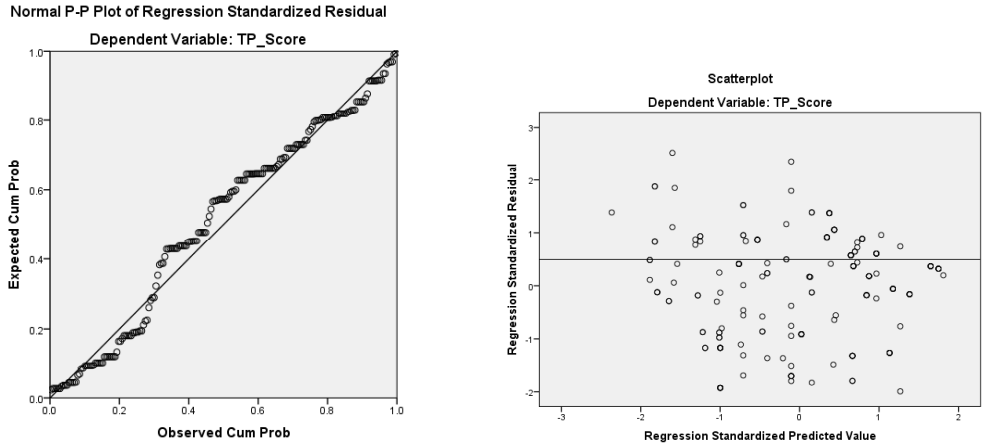


Figure 13: p-p plot and scatterplot for the regression between teacher demographics and teachers' professionalism scores

Students' demographic characteristics were entered as predictors of achievement scores of students in multiple regression and separate regression models were generated for mathematics and science achievement scores. The demographic characteristics of students can be seen in Table 17.

Table 17: Demographic profile of students who participated in the study

Demographics	**Category**	**N**	**%**
Board	RBSE	270	63.6
	CBSE	154	36.3
Gender	Male	145	34.1
	Female	279	65.8
Preschool	Attended	211	49.7
	Did not Attend	213	50.2
Tuition/Coaching	Yes	210	49.5
	No	214	50.4

The predictors entered were schools' board of certification (State Board or Central Board of Secondary Education); gender of students; whether the students attended preschool or not; and whether the students attend tuitions outside the school or not. Before proceeding with the regression analysis, the correlation between the predictor and dependent variable was checked so that variables that are not correlated can be removed. The correlation analysis depicted in Table 18, shows that all the variables correlated and rather all the predictor variables were significantly correlated with mathematics and science achievement scores at the 0.01 level.

Table 18: Correlation between the students' characteristics and mathematics and science achievement scores

Correlations

		Mathematics Achievement	Board	Gender	Preschool	Tuition
Mathematics Achievement	Pearson Correlation	1				
	Sig. (2-tailed)					
Board	Pearson Correlation	**.700****	1			
	Sig. (2-tailed)	.000				
Gender	Pearson Correlation	**.486****	**.544****	1		
	Sig. (2-tailed)	.000	.000			
Preschool	Pearson Correlation	**-.574****	**-.739****	**-.389****	1	
	Sig. (2-tailed)	.000	.000	.000		
Tuition/Coaching	Pearson Correlation	**.570****	**.748****	**.410****	**-.703****	1
	Sig. (2-tailed)	.000	.000	.000	.000	

		Science Achievement	Board	Gender	Preschool	Tuition
Science Achievement	Pearson Correlation	1				
	Sig. (2-tailed)					
Board	Pearson Correlation	**.610****	1			
	Sig. (2-tailed)	.000				
Gender	Pearson Correlation	**.452****	**.544****	1		
	Sig. (2-tailed)	.000	.000			
Preschool	Pearson Correlation	**-.480****	**-.739****	**-.389****	1	
	Sig. (2-tailed)	.000	.000	.000		
Tuition/Coaching	Pearson Correlation	**.508****	**.748****	**.410****	**-.703****	1
	Sig. (2-tailed)	.000	.000	.000	.000	

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

*. Correlation is significant at the 0.05 level (2-tailed).

After establishing correlations between the predictor and dependent variable, a significant regression equation was found for mathematics achievement with,

$$(F\ (4, 420) = 111.25, p<.01)$$

The power of the regression model (R Sq.) was 0.51 which implies that the predictors contribute to 51% of changes in the dependent variable i.e., mathematics achievement of students. School Board, Gender, and Preschool emerged as significant predictors of mathematics achievement. Students belonging to CBSE affiliated schools scored significantly 12.004 marks more as compared to students belonging to RBSE affiliated schools.

Female students performed significantly better than male students scoring 3.982 marks more. Preschool also significantly predicted mathematics achievement with students who had not completed preschool scoring 2.53 marks less than the students who completed preschool. Tuition was not found to be a significant predictor of mathematics achievement of students, but the coefficients depict that although not significant, students not taking tuition scored 1.61 marks more than students who took tuitions outside the schools.

A significant regression equation was also generated for science achievement with,

$$(F\ (4, 420) = 69.46, p<.01)$$

The power of the regression equation (R Sq.) was found to be 0.39 implying that the predictor variables accounted for 39% of the change in the dependent variable i.e., science achievement scores of students. Only school board of affiliation and students' gender emerged as significant predictors of science achievement scores of students (Table 19). CBSE school students scored 11.24 marks more than students studying in

RBSE schools on Science Achievement Test. Similarly, female students scored 4.71 marks more than the male students in science.

Although not significant, students who attended preschool and also students who do not take tuitions scored higher than their counterparts. The model for mathematics achievement was found to be free of collinearity and autocorrelation. The tolerance index for all the predictor variables was found to be acceptable i.e., above 0.20, and also the Variance Inflation Factor (VIF) values were all below 4. The Durbin Watson Test value was found to be 1.44 which again is near to the ideal value 2.

Table 19: Multiple regression results for the effect of students' demographic characteristics on their mathematics and science achievement scores

					Collinearity Statistics								Collinearity Statistics	
Mathematics Achievement	**Coef.**	**Std. Err.**	**t**	**p>|t|**	**Tolerance**	**VIF**	**Science Achievement**	**Coef.**	**Std. Err.**	**t**	**p>|t|**	**Tolerance**	**VIF**
Board							**Board**						
RBSE (Ref.)					0.303	3.296	RBSE (Ref.)					0.303	3.296
CBSE	**12.004**	1.52	7.89	0			CBSE	**11.242**	1.873	6	0		
Gender							**Gender**						
Male (Ref.)					0.703	1.422	Male (Ref.)					0.703	1.422
Female	**3.982**	1.01	3.73	0			Female	**4.71**	1.247	3.78	0		
Preschool							**Preschool**						
Yes (Ref.)					0.402	2.486	Yes (Ref.)					0.402	2.486
No	**-2.538**	1.27	-2	0.046			No	-0.876	1.565	-0.56	0.576		
Tuition/Coaching							**Tuition/Coaching**						
Yes (Ref.)					0.391	2.56	Yes (Ref.)					0.391	2.56
No	1.615	1.289	1.25	0.211			No	2.784	1.588	1.75	0.08		
Constant	12.114	1.306	9.27	0			Constant	11.903	1.609	7.4	0		

* . significant at the 0.05 level.
**. significant at the 0.01 level.

The model with science achievement scores as the DV was also found to be free of collinearity and autocorrelation. The values of tolerance index and Variance Inflation Factor (VIF) were found to be falling in their respective acceptable ranges. The Durbin Watson Test value for the model was found to be 1.30 which is near the ideal value 2.

The uniform distribution of residuals to ensure homoscedasticity in the data was also checked for both the Mathematics and Science Achievement model. The p-p plot and the scatterplot were drawn to check homoscedasticity. The residuals from mathematics and science achievement as the DV were arranged in p-p plot and scatterplot as can be seen in Figure 14.

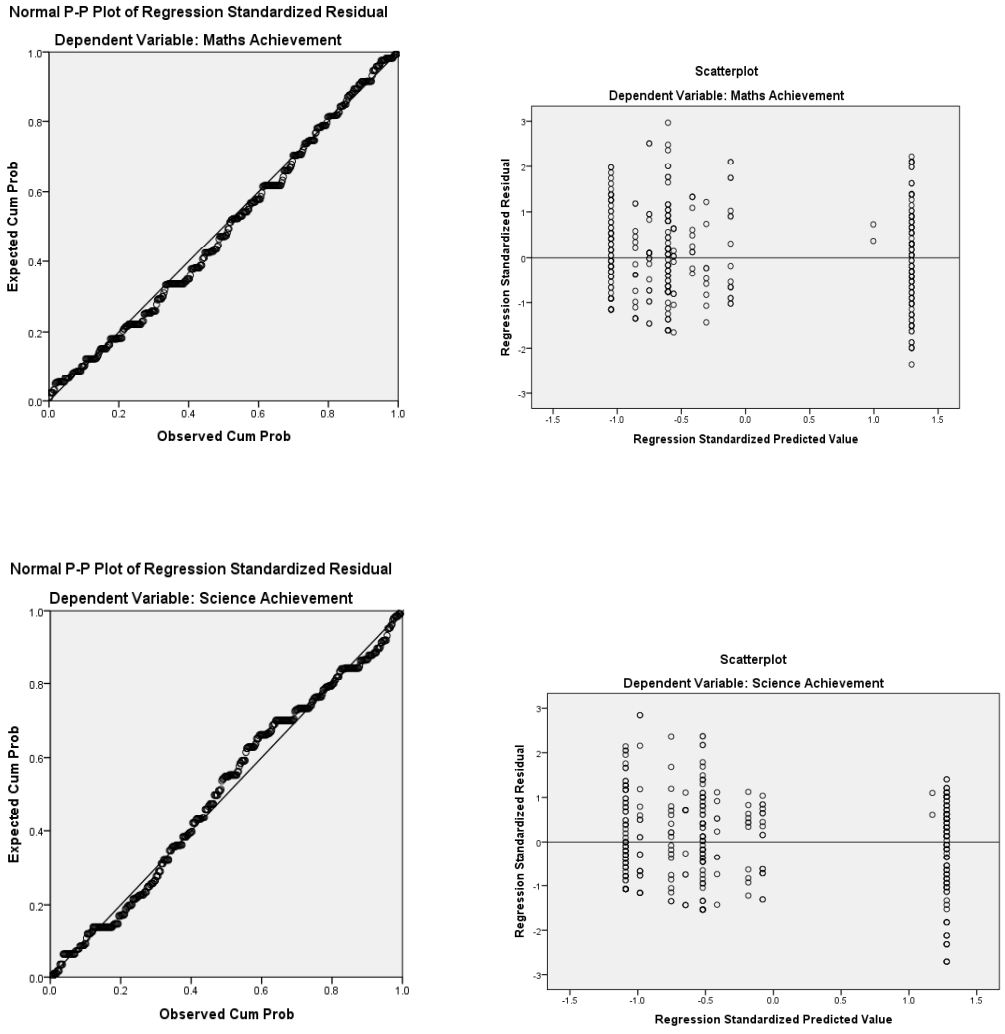


Figure 14: p-p plot and scatter plot for mathematics and science achievement

The p-p plots show that the residuals are normally distributed along the line. The scatterplot depicts that the residuals are equally arranged above and below the zero line. The p-p plots and scatterplot for both the subjects reveal that the data used for the regression analysis was free of heteroscedasticity.

OBJECTIVE 4: *To identify the differences in the way the demographic indicators predict student achievement and teacher professionalism in private and public secondary schools.*

Regression models were also generated separately for private and public schools in the sample to assess how differently the same independent variables predict teachers' professionalism in both types of schools. The demographic profile of private school teachers can be found in Table 20.

Table 20: Demographic profile of private school teachers who participated in the study

Demographics	Category	N	Percentage
Gender	Male	45	47.4
	Female	50	52.6
Academic Qualification	Bachelors	5	5.3
	Masters	80	84.2
	M.Phil.	5	5.3
	Ph.D.	5	5.3
Age	25-35 years	35	36.8
	36-45 years	15	15.8
	46-55 years	30	31.6
	56 years and above	15	15.8
Experience	0-10 years	35	36.8
	11-20 years	10	10.5
	21-30 years	25	26.3
	31-40 years	25	26.3
Job Description	Assistant Teacher	10	10.5
	TGT	35	36.8
	PGT	50	52.6
Annual Income	Up to 3 Lakhs	5	5.3
	4- 6 Lakhs	20	21.1
	7-10 Lakhs	25	26.3
Professional Qualification	Untrained	22	23.2
	Diploma	10	10.5
	B.Ed.	53	55.8
	M.Ed.	10	10.5

Correlation was checked before proceeding with the regression analysis between the predictor and dependent variables in both private and public schools. The results have been recorded in Table 21.

Table 21: Correlation between teacher demographic characteristics and teacher professionalism scores

Correlations (Private School Teachers)									
		Gender	**Age**	**Job Description**	**Experience**	**Annual Income**	**Academic Qualification**	**Professional Qualification**	**Professionalism**
Gender	Pearson Correlation	1							
	Sig. (2-tailed)								
Age	Pearson Correlation	**.601****	1						
	Sig. (2-tailed)	.000							
Job Description	Pearson Correlation	**-.346****	**-.287****	1					
	Sig. (2-tailed)	.001	.005						
Experience	Pearson Correlation	**.583****	**.956****	**-.278****	1				
	Sig. (2-tailed)	.000	.000	.006					
Annual Income	Pearson Correlation	**.726****	**.870****	**-.273****	**.861****	1			
	Sig. (2-tailed)	.000	.000	.007	.000				
Academic Qualification	Pearson Correlation	.181	-.045	.164	-.143	-.032	1		
	Sig. (2-tailed)	.079	.665	.113	.167	.756			
Professional Qualification	Pearson Correlation	-.025	-.114	**.296****	-.100	**-.255***	-.092	1	
	Sig. (2-tailed)	.806	.271	.004	.334	.013	.374		
Professionalism	Pearson Correlation	.177	**.289****	-.158	**.352****	**.348****	.166	-.038	1
	Sig. (2-tailed)	.086	.005	.127	.000	.001	.108	.717	

**. Correlation is significant at the 0.01 level.

*. Correlation is significant at the 0.05 level.

The correlation results for private school teachers depict that all the predictors were correlated with the dependent variable (Professionalism). Professionalism was found to be significantly correlated with age, experience, and annual income of teachers in private schools.

Table 22: Multiple regression results for the effect of teacher demographic characteristics on professionalism scores in private schools

TP_Score	Coef.	Std. Err.	t	p > |t|	Tolerance	VIF
Gender					0.315	3.172
Male (Ref.)						
Female	**-20.81**	2.357	-8.83	0.000		
Experience					0.372	3.944
0-10 years (Ref.)						
11-20 years	**-16.302**	3.826	-4.26	0.000		
21-30 years	**9.418**	3.215	2.93	0.004		
31-40 years	**10.579**	2.946	3.591	0.001		
Academic Qualification					0.693	1.443
Bachelors (Ref.)						
Masters	**-9.232**	3.26	-2.83	0.006		
M.Phil.	0.581	0.07	0.14	0.887		
Ph.D.	**28.302**	5.402	5.24	0.000		
Job Description					0.662	1.51
Assistant Teacher (Ref.)						
TGT	**6.67**	1.839	3.63	0.000		
PGT	**-12.04**	1.825	-6.60	0.000		
Professional Qualification					0.646	1.548
B.Ed. (Ref.)						
M.Ed.	**19.232**	2.096	9.17	0.000		
Untrained	**-20.453**	0.94	12.34	0.000		
Diploma	**16.883**	1.63	10.36	0.000		
Annual Income					0.326	2.22
Below 3 Lakhs (Ref.)						
3-6 Lakhs	**32.279**	1.916	16.85	0.000		
Above 6 lakhs	**9.908**	2.926	3.386	0.001		
Age Group					0.469	1.76
25-35 years (Ref.)						
36-45 years	-6.465	3.938	-1.64	0.105		
46-55 years	**14.093**	3.029	4.65	0.000		
56 years and above	**30.186**	1.865	16.18	0.000		
Constant	90.046	3.561	25.29	0.000		

*. significant at the 0.05 level.
**. significant at the 0.01 level.

A significant regression equation was obtained with,

$$(F\ (14, 80) = 49.37, p<.01)$$

The R. Sq. of the model 0.89 depicting that the predictors contribute to 89% of changes in the dependent variable i.e., teachers' professionalism. The results predict that teachers' gender, experience, academic degree, job description/designation, professional training, annual income and age, all contribute significantly to professionalism in private schools.

As indicated in Table 22, the gender of teachers emerged as a significant predictor of professionalism in private schools where female teachers scored 20.81 units less than male teachers on the professionalism scale. The experience of teachers also predicted professionalism. The lowest professionalism scores were found to be of teachers that had 11-20 years of experience. Both recently appointed and highly experienced teachers exhibited a higher degree of professionalism. Teachers having 31-40 years of experience scored 10.579 units more than the reference category (0-10 years of experience). Similarly, teachers possessing masters and Ph.D. degrees were found to be significantly contributing to the professionalism of teachers. However, it was observed that teachers possessing master's degrees contributed negatively to professionalism as compared to graduation degree (reference category), and Ph.D. teachers scored significantly more than graduate teachers. At the same time, it can also be observed from the results that teachers appointed as TGT teachers were more professionalized than assistant teachers but at the same time assistant teachers performed better than PGT teachers on the professionalism scale.

For private schools, B.Ed. training contributed the least to professionalism apart from untrained teachers, with M.Ed. teachers scoring 19.232 units more and Diploma

teachers scoring 16.883 units more than B.Ed. teachers on the professionalism scale. Annual Income was also found to be a significant predictor of professionalism of teachers in private schools with, teachers earning between 3-6 Lakhs in a year scoring 32.279 units more than teachers earning less than 3 lakhs a year. Also, teachers earning more than 6 lakhs a year score just 9.908 units significantly more than teachers earning less than 3 lakh a year. With respect to the age of teachers, it was found that teachers belonging to the age group 46-55 years and more than 56 years of age predicted professionalism significantly. Teachers belonging to the age group 46-55 years of age score 14.093 units more than teachers aged 25-35 years and teachers aged 56 years and above scoring 30.186 units more than the reference category.

The collinearity statistic values (tolerance and VIF) values were all found to be falling in the acceptable range indicating that there exists no exaggeration of coefficients due to collinearity for any predictor variable. The Durbin Watson test value was also found to be .98 which also indicates acceptable autocorrelation in the regression model. Figure 15 presents the p-p plot and scatterplot also indicate that the arrangement of residuals around the best fit line indicates the absence of heteroscedasticity in the data.

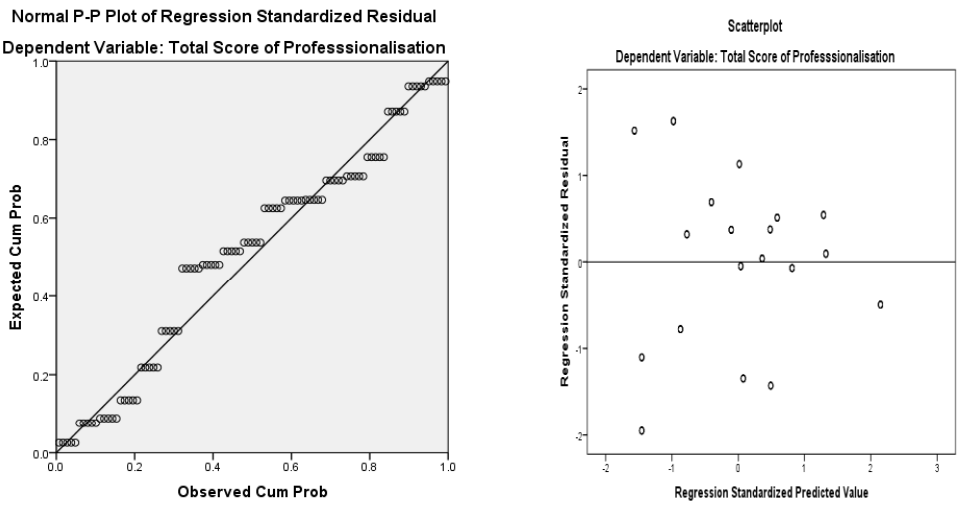


Figure 15: p-p plot and scatterplot for teacher professionalism in private schools

Prior to proceeding with regression analysis for public school teachers and their professionalism, the correlation between the IVs and the DV were checked. The demographic profile of public-school teachers can be seen in Table 23.

Table 23: Demographic profile of public-school teachers who participated in the study

Demographics	**Category**	**N**	**%**
Gender	Male	53	53
	Female	44	47
Academic Qualification	Bachelors	30	30
	Masters	67	69
	M.Phil.	0	0
	Ph.D.	0	0
Age	25-35 years	8	8
	36-45 years	24	27
	46-55 years	34	34
	56 years and above	31	31
Experience	0-10 years	43	46
	11-20 years	20	20
	21-30 years	28	28
	31-40 years	6	6
Job Description	Assistant Teacher	0	0
	TGT	0	0
	PGT	97	100
Annual Income	Up to 3 Lakhs	5	5
	4- 6 Lakhs	64	67
	7-10 Lakhs	28	28
Professional Qualification	Untrained	0	0
	Diploma	0	0
	B.Ed.	97	100
	M.Ed.	0	0

The correlation coefficients depicted in Table 24 explain that for public schools only the annual income of teachers was found to be significantly correlated with the professionalism of teachers. Correlation coefficients were not generated for job description and highest vocational degree of teachers because all the teachers in the sample were appointed as PGTs and also all of them possessed B.Ed. training. Therefore, these two variables would have to be removed from the regression analysis of the professionalism of public-school teachers.

Table 24: Correlation between teacher demographic characteristics and professionalism scores of public-school teachers

Correlations (Public School Teachers)									
		Gender	**Age**	**Job Designation**	**Years of Service**	**Annual Income**	**Academic Qualification**	**Professional Qualification**	**Professionalism**
Gender	Pearson Correlation	1							
	Sig. (2-tailed)								
Age	Pearson Correlation	-.050	1						
	Sig. (2-tailed)	.620							
Job Designation	Pearson Correlation	-	-	-					
	Sig. (2-tailed)								
Years of Service	Pearson Correlation	-.006	**.506****	-	1				
	Sig. (2-tailed)	.949	.000						
Annual Income	Pearson Correlation	**-.221***	**.459****	-	**.379****	1			
	Sig. (2-tailed)	.027	.000		.000				
Academic Qualification	Pearson Correlation	-.033	**-.247***	-	-.122	-.084	1		
	Sig. (2-tailed)	.743	.014		.228	.406			
Professional Qualification	Pearson Correlation	-	-	-	-	-	-	-	
	Sig. (2-tailed)								
Professionalism	Pearson Correlation	-.138	-.019	-	.078	**.207***	-.004		1
	Sig. (2-tailed)	.170	.853	-	.440	.039	.971		

*. significant at the 0.05 level (2-tailed).
**. significant at the 0.01 level (2-tailed).

The regression equation obtained for the professionalism of teachers in the public schools was not significant,

$$(F\ (9, 87) = 1.73, p<0.08)$$

With an R. Sq. of 0.17 which implies that the predictors only contribute for only 17% of the change in the dependent variable in public schools. None of the predictor

variables contributed significantly to the professionalism of teachers in the public schools as can be seen in Table 25.

Table 25: Multiple regression results for the effect of teacher demographic characteristics on professionalism in public school teachers

TP_Score	Coef.	Std. Err.	t	p > |t|	Tolerance	VIF
Gender					0.939	1.065
Male (Ref.)						
Female	-.570	2.385	-0.24	0.812		
Experience					0.714	1.397
0-10 years (Ref.)						
11-20 years	-3.667	3.335	-1.10	0.275		
21-30 years	1.124	3.894	0.29	0.773		
31-40 years	-4.621	6.027	-0.77	0.445		
Academic Qualification					0.936	1.06
Bachelors (Ref.)						
Masters	-.249	2.625	-0.10	0.924		
Annual Income					0.716	1.397
Below 3 Lakhs (Ref.)						
3-6 Lakhs	-6.563	6.428	-1.02	0.31		
Above 6 lakhs	1.827	7.06	0.26	0.797		
Age Group					0.629	1.59
25-35 years (Ref.)						
36-45 years	-3.488	5.42	-0.64	0.522		
46-55 years	-2.968	5.726	-0.52	0.606		
56 years and above	-4.842	6.058	-0.8	0.426		
Constant	93.32	5.55	16.79	0.00		

*. significant at the 0.05 level.
**. significant at the 0.01 level.

Although not significant, the coefficients indicate that female teachers scored less than male teachers on the professionalism scale. Teachers with more than 30 years of experience scored 4.621 units less than teachers than recently recruited teachers. Teachers possessing master's degree scored 0.249 units less than graduate teachers on

the professionalism scale. Coefficients for annual income indicate that teachers earning between 3-6 Lakhs per annum score perform better than teachers earning less than 3 Lakhs but at the same time, teachers earning more than 6 Lakhs per annum perform poorly than teachers with annual income less than 3 lakhs. Similarly, younger teachers performed better than teachers belonging to the higher age groups. However, the results cannot be generalized as the regression coefficients were not significant.

The model was also checked for collinearity and autocorrelation. The tolerance index and the VIF values indicate that the data was free of collinearity as all the values fall in the acceptable range of the statistic. Similarly, the Durbin Watson Value was found to be .861 which again indicates no significant autocorrelation problems in the data. Figure 16 depicts the normal distribution of residuals along the line of best fit (p-p plot) and the scatterplot where the residuals appear to be arranged uniformly above and below the zero line, thus, evading the suspicions of heteroscedasticity in the data.

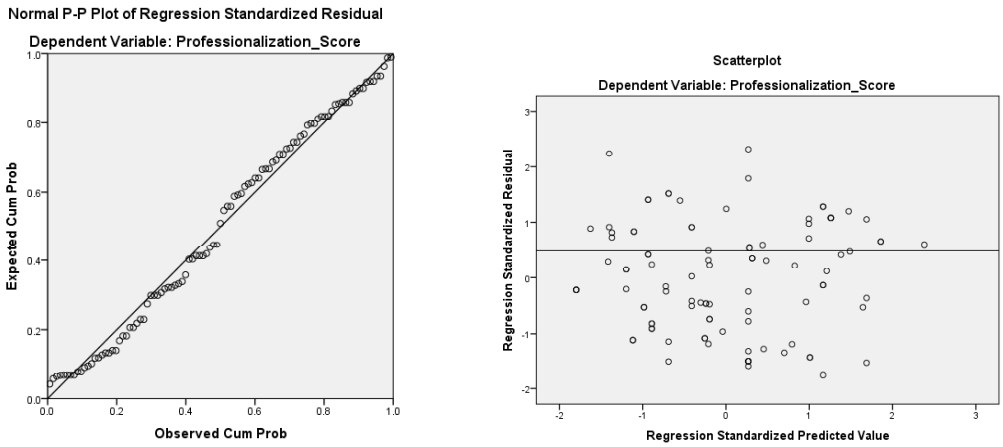


Figure 16: p-p plot and scatterplot for public school teachers

Correlation was checked before performing regression with Science and Mathematics achievement scores of students of private schools. Table 26 depicts the demographic profile of private school students.

Table 26: Demographic profile of private school students who participated in the study

Demographics	Category	N	Percentage
	RBSE	46	23
Board	CBSE	154	77
	Male	85	42.5
Gender	Female	115	57.5
	Attended	190	95
Preschool	Did not attend	10	5
	Yes	49	24.5
Tuition/Coaching	No	151	75.5

The correlation coefficients depicted in Table 27 convey that all the predictor variables were correlated significantly with the mathematics scores of students of private schools. Science Achievement scores of students were significantly correlated with all the predictors except preschool. Also, the Mathematics and Science scores of students were significantly and positively correlated. Since all of the variables were correlated with each other, regression analysis was carried out for examining the effect of students' demographic characteristics on their mathematics and science scores.

Table 27: Correlation between demographic characteristics and mathematics and science scores of private school students

Correlations (Private Schools)							
		Board	**Gender**	**Preschool**	**Tuition/Coaching**	**Mathematics Achievement**	**Science Achievement**
Board	Pearson Correlation	1					
	Sig. (2-tailed)						
Gender	Pearson Correlation	**.643****	1				
	Sig. (2-tailed)	.000					
Preschool	Pearson Correlation	**-.311****	-.066	1			
	Sig. (2-tailed)	.000	.353				
Tuition/Coaching	Pearson Correlation	**.462****	**.584****	-.039	1		
	Sig. (2-tailed)	.000	.000	.587			
Mathematics Achievement	Pearson Correlation	**.547****	**.436****	**-.168***	**.338****	1	
	Sig. (2-tailed)	.000	.000	.018	.000		
Science Achievement	Pearson Correlation	**.459****	**.366****	-.030	**.254****	**.414****	1
	Sig. (2-tailed)	.000	.000	.676	.000	.000	

**. significant at the 0.01 level (2-tailed).
*. significant at the 0.05 level (2-tailed).

The regression equation obtained for Mathematics Achievement was significant as,

$$(F\ (4, 194) = 22.407, p<.000)$$

With an R. Sq. of 0.315 which implies that the predictors accounted for 31.5% of the variance in the mathematics scores of students in private schools. Similarly, a significant regression equation was also obtained for science achievement,

$$(F\ (4, 194) = 14.534, p<.000)$$

With an R. Sq. of .230 which again implies that the predictors contributed to 23% of the variance in the science achievement scores of students. The significance of the models indicates that the predictors together have a significant effect on the mathematics and science achievement of students.

Individually, as depicted in Table 28, it can be interpreted that only the school board contributes significantly to the mathematics and science achievement of students, with CBSE school students getting 10.482 marks significantly more than students belonging to RBSE schools on the Mathematics Achievement Test. Also, students of CBSE schools secured 11.648 marks significantly more than students belonging to RBSE schools on the Science Achievement Test. Although not significantly, female students performed better than male students in both science and mathematics. Preschool had a positive impact on mathematics achievement but was found to have a negative impact on the science achievement scores of students. Tuitions outside the school had a negative impact on both science and mathematics scores of students.

The analysis was free of collinearity as the tolerance index and the IVF values for all the predictors were found to be acceptable. Also, the Durbin-Watson value for the regression model of mathematics was found to be 2.1, and for science achievement, it was found to be 1.8 which both fall under the acceptable range.

Table 28: Multiple regression results for private school students

Coefficients (Mathematics Achievement)								Coefficients (Science Achievement)							
	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics			Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
Model	B	Std. Error	Beta	t	Sig.	Tolerance	VIF	Model	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1 (Constant)	-3.838	6.027		-.637	.525			1 (Constant)	-5.765	7.159		-.805	.422		
Board	**10.482**	2.020	.434	5.188	.000	.503	1.990	**Board**	**11.648**	2.400	.430	4.854	.000	.503	1.990
Gender	3.750	2.806	.115	1.336	.183	.471	2.121	**Gender**	3.435	3.332	.094	1.031	.304	.471	2.121
Preschool	-1.063	2.964	-.023	-.358	.720	.870	1.149	**Preschool**	5.770	3.521	.110	1.639	.103	.870	1.149
Tuition/Coaching	2.966	3.162	.069	.938	.349	.644	1.552	**Tuition/Coaching**	.192	3.755	.004	.051	.959	.644	1.552

*. significant at the 0.05 level.
**. significant at the 0.01 level.

Heteroscedasticity was also checked with the help of a p-p plot and scatter plot for both mathematics and science regression models depicted in Figure 17. The results exhibit a normal distribution of residuals for both the models, which implies that the data is devoid of heteroscedasticity.

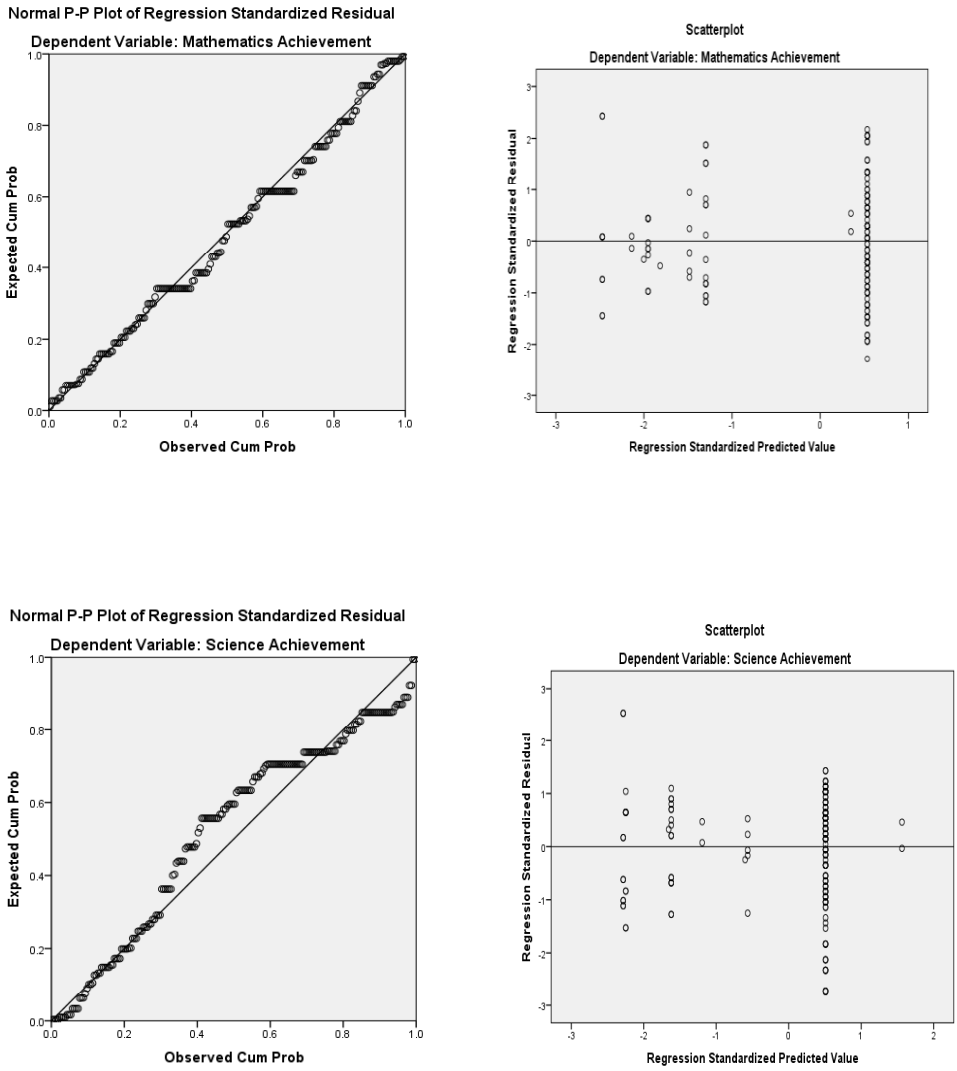


Figure 17: p-p plot and scatterplot for mathematics and science achievement scores of private school students

The demographic profile of students of public schools has been outlined in Table 29. Correlations were calculated between the Independent Variables (IV) and Dependent Variables (DV) for public schools as can be seen in Table 30. No coefficients were generated for the school board as all the public schools in the sample were affiliated

with the Rajasthan Board of Secondary Education (RBSE). Therefore, the variable school board of affiliation was removed from the regression analysis.

Table 29: Demographic profile of public-school students who participated in the study

Demographics	**Category**	**N**	**%**
	RBSE	224	100
Board	CBSE	0	0
	Male	123	54.9
Gender	Female	101	45.1
	Attended	21	9.4
Preschool	Did not attend	203	90.3
	Yes	26	88.4
Tuition/Coaching	No	198	11.6

Gender was found to be significantly correlated to mathematics and science achievement in public schools. Mathematics and science scores of students were also found to be correlated significantly.

Table 30: Correlation between demographic characteristics and mathematics and science achievement scores of public- school students

Correlations (Public School)							
		Board	**Gender**	**Preschool**	**Tuition/Coaching**	**Mathematics Achievement**	**Science Achievement**
Board	Pearson Correlation	.[a]					
	Sig. (2-tailed)						
Gender	Pearson Correlation	.[a]	1				
	Sig. (2-tailed)						
Preschool	Pearson Correlation	.[a]	-.045	1			
	Sig. (2-tailed)		.501				
Tuition/Coaching	Pearson Correlation	.[a]	**-.160**[*]	-.021	1		
	Sig. (2-tailed)		.016	.756			
Mathematics Achievement	Pearson Correlation	.[a]	**.202**[**]	.016	-.068	1	
	Sig. (2-tailed)		.002	.817	.312		
Science Achievement	Pearson Correlation	.[a]	**.217**[**]	-.008	.003	**.536**[**]	1
	Sig. (2-tailed)		.001	.908	.969	.000	

*Significant at the 0.05 level (2-tailed).
**Significant at the 0.01 level (2-tailed).
a. Cannot be computed because at least one of the variables is constant.

A significant regression equation was obtained for mathematics achievement in public schools,

$$(F\ (3, 220) = 3.268, p< .022)$$

With an R. Sq. of .043 which implies that the IVs cause only 4.3% variance in the DV. The model was found to be significant at the 0.05 level which indicates that although the power of the model is low, the prediction of DV by the IVs is significant. Similar results were obtained for science achievement in public schools,

$$(F\ (3, 220) = 3.726, p< .012)$$

With an R. Sq. of .048 implying that the IVs contributed only 4.8% in the occurrence of the DV.

Table 31: Multiple regression results for the effect of students' demographic characteristics on mathematics and science achievement scores of public-school students

Coefficients (Mathematics Achievement)								Coefficients (Science Achievement)							
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance VIF			B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	9.997	0.805		12.419	0		1	(Constant)	10.899	1.022		10.668	0		
	Gender	**3.242**	1.099	0.197	2.95	0.004	0.972 1.029		Gender	**4.661**	1.395	0.223	3.341	0.001	0.972	1.029
	Preschool	0.664	1.853	0.024	0.359	0.72	0.997 1.003		Preschool	0.111	2.351	0.003	0.047	0.962	0.997	1.003
	Tuition/Coaching	-0.911	1.706	-0.036	-0.534	0.594	0.974 1.027		Tuition/Coaching	1.247	2.166	0.038	0.576	0.565	0.974	1.027

*. significant at the 0.05 level.

**. significant at the 0.01 level.

The regression analysis results in Table 31 depict that for both science and mathematics, gender emerged as a significant predictor individually. Female students performed significantly better than male students by scoring 3.242 marks and 4.661 marks more than male students in mathematics and science achievement tests respectively. Preschool and tuition did not have a significant effect on the mathematics and science achievement of students.

It can be observed from the coefficients that preschool had a negative effect on the scores of students in both subjects in public school. Tuitions, on the other hand, had negative effects on science achievement but positive effects on the mathematics achievement of students.

The analysis was free of serious collinearity and autocorrelations concerns. The tolerance index and the IVF values were found to be acceptable. Also, the Durbin Watson value for the mathematics test was found to be 0.820 and for the science achievement test it was 0.843.

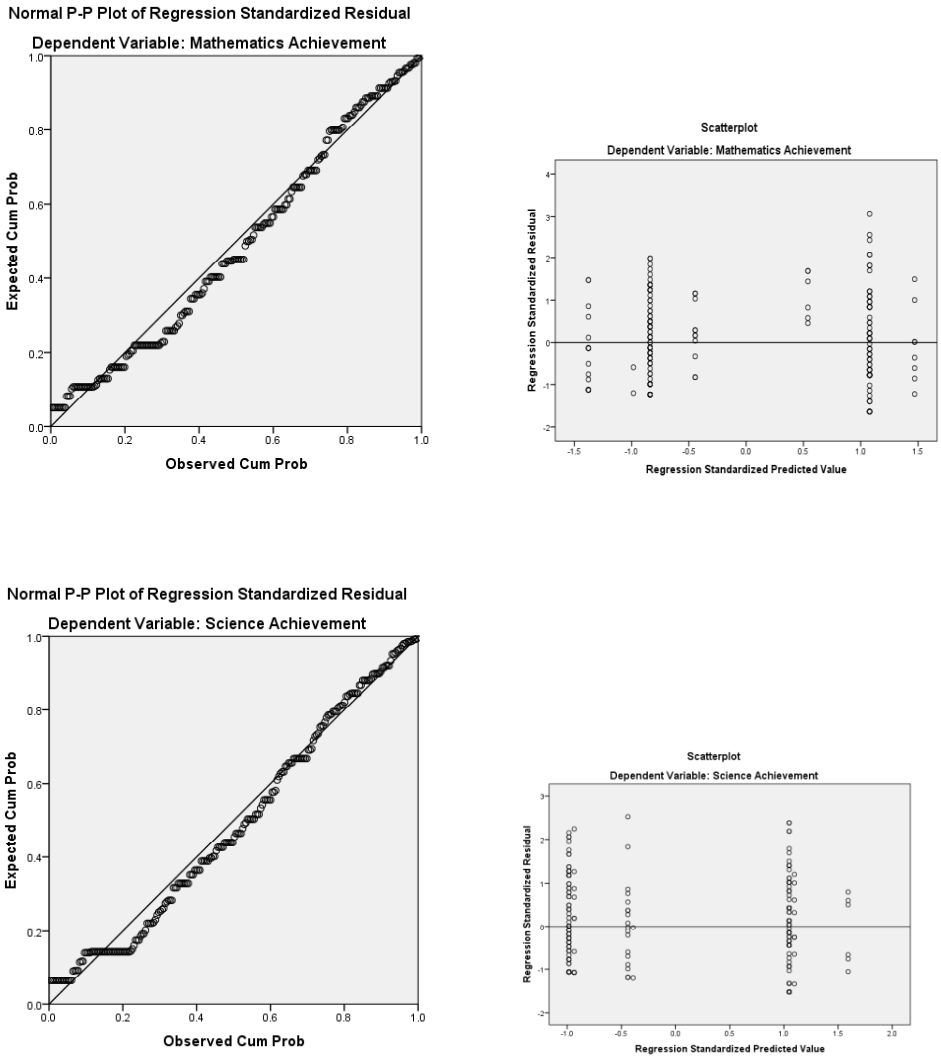


Figure 18: p-p plot and scatterplot for mathematics and science achievement of public-school students

The data were also checked for heteroscedasticity, the graphs in Figure 18 depict that both models were free of heteroscedasticity as the residuals were found to be arranged normally on the p-p plot along the line of best fit and the scatterplot shows that the residuals were found to be arranged uniformly below and above the zero line.

4.2 Qualitative Results: Analysis of Interviews

The researcher used the mixed-method design to conduct the study, wherein qualitative data were also collected along with quantitative data. Qualitative data was collected to substantiate the findings of the quantitative data analysis. Semi-structured interviews of teachers were conducted to comprehend the insights of these stakeholders on the prevalent status of teachers' professional practice, the barriers that hinder them, and the measures that can elevate the status of the profession. Along with the analysis of interviews conducted, field notes of observation prepared by the researcher at the time of data collection have also been amalgamated in this section to come up with an understanding of the notions of the interviewee and their perspectives.

Semi-structured interviews are the most popular and frequently used tools of data collection in the fields of social sciences (Bradford & Cullen, 2012). Data collected from semi-structured interviews facilitate the exploration of subjective opinions (Flick, 2009) and also creating a collection of in-depth descriptions of experiences (Evans, 2018). An interview schedule is used to guide the data collector but at the same time gives the responder to elaborate on the issues and topics that are relevant to them which leads to the development of themes in the analysis (Choak, 2012). Qualitative semi-structured interviews help study experiences, realities, and meanings as disclosed by discourses, assumptions, or ideas that exist in the larger society (Braun & Clarke, 2006).

In order to analyze the data collected through semi-structured interviews, the researcher used the Thematic Analysis Technique. Braun & Clarke (2006) states that the thematic analysis technique is the most frequently used approach technique for the analysis of data gathered by the semi-structured interviews as the technique is not underpinned by a

specific theoretical framework or epistemology persuasion. They also argue that the technique is particularly useful for researchers who work within the paradigms of realism or constructivism. The technique involves the identification of themes and patterns in the data which as a process starts right from the point of data collection till the stage where the transcription, continuous reading of the data, and finally its analysis and interpretation takes place (Evans, 2017). Themes appear frequently across the dataset, and the importance and usability of these emerging themes depend on the theoretical position of the researcher or whether they fall under the umbrella of the research questions of the study. The themes that emerged from the data gathered through semi-structured interviews conducted under the current study have been elaborated in the succeeding sections.

4.2.1 Status of Teaching as a Profession

Teachers are considered to be agents of social change and development. Their role becomes even more important at the school education level. They serve as the first role models for students and open up avenues of knowledge as they grow. Teachers' evolution as a professional, impacts not just their career but also shapes the future of many students. The most important issue addressed through this research is that to what extent secondary school teachers practice as professionals while carrying out their duties. In order to understand this, it is important to understand the perception of teachers towards teaching being a profession or not. In public schools, almost all the teachers accepted teaching to be a profession, especially the newly appointed teachers. But when asked about whether their profession garners respect at par with other established professions like doctors and lawyers, the teachers opined that their profession does garner them

respect but they don't think is at the same pedestal as the profession of doctors and lawyers. Older teachers who were more experienced expressed that according to them the respect of the profession has declined over the years. Parents no longer trust teachers blindly as they used to in earlier years. According to the teachers, the attitude of students has also changed towards their teachers. Earlier teachers served as role models and discipline was considered to be the most important way of student life. They state that earlier, students remembered their teachers and acknowledged their teachers' role in their growth and development both at the personal and professional level which is very rarely seen in students today.

In private schools there existed a more commonly held opinion that teaching has not yet fully achieved the status of a profession. All the teachers opined that the teaching profession does not stand on the same pedestal as other established professions. In private institutions, the teachers opined that they do get the trust and respect of students as well as their parents. However, they don't think the teaching profession, especially school teaching, gets its due status in society.

4.2.2 Experience and Professionalism

With respect to the significance of the difference in the professionalism of teachers in groups based on experience, annual income, and job designation, teachers in both public and private schools emphasized the importance of experience and insisted on how experiences shape and improves one's professional practice. In public schools, teachers opined that high income and higher designation are a reward of their experiential learning in the profession since both are dependent on the years of service they have completed. Private school teachers opined those qualifications are important to start from a particular

job designation but after getting into the job it's the experiences a teacher goes through which make them more of a professional. However, younger teachers disagree with this notion and state that experiences are important in shaping a teachers' professional practice but the commonly held opinion that professionalism comes with years of service is untrue for them. According to them, exposure, opportunities, and interaction are some of the key aspects that make experiences rich which can be imbibed by young teachers also but such teachers are barely entrusted with defining roles and responsibilities at the starting of their teaching careers.

4.2.3 Gender and Professionalism

Gender dynamics play an important role in identifying the interplay of social behaviors that demand a degree of accountability in ones' professional practice. It is crucial to understand the difference in the routes taken by male and female teachers to improve professionally inside their teaching roles which have a direct impact on the learning of students at the secondary school level. Although we see that there is no significant difference in the professionalism scores of male and female teachers quantitatively, differences in the course of involvement in their profession can be identified through qualitative analysis. On being asked whether they found teaching secondary grades difficult, the female teachers opined that they bear the burden of responsibilities at both home and school. They think that it is very difficult for them to balance home and school effectively and perform as well as their male counterparts in their professional roles. None of the teachers reported direct discrimination or denied equal opportunities but they acknowledge the fact that the dual pressure of fulfilling home duties and professional duties proves to be a hurdle only for female teachers. A teacher also narrated that she has

often faced criticisms from family members who demand her sole attention on the household chores and it becomes a task for her to continue her professional practice uninterrupted. Male teachers when asked about their views on the issue agreed that female teachers put more effort into balancing home and school duties. They admit that they do not face such circumstances. They can fulfill their professional duties with ease and efficiency as compared to female teachers.

Although no difference was found in the professionalism scores of male and female teachers, there was a difference in the flow of communication between teachers and students. Female teachers preferred to maintain a distance from male students both inside the school and outside, whereas male teachers were comfortable in communicating with both male and female students. Male teachers admitted that they could comfortably communicate with students and their parents without the gender of the student affecting the transactions between them. Additionally, accessibility of public schools in rural areas was also reported as a problem that affects female teachers the most. Despite such differences, the quantitative results reveal that female teachers have a significant positive effect on students' performance than male teachers in public schools. This clarifies that even after facing all kinds of gender-bound social barriers, female teachers in public schools are making a sincere effort towards fulfilling their professional duties at their best.

4.2.4 Income and Professionalism

The teaching profession witnesses a wide range of differences in the compensation offered to teachers worldwide which posits an important debate concerning whether higher wages reflect better professional practice and accountability. The findings of the

quantitative analysis revealed that there exists a significant difference in the professionalism scores of teachers in groups divided based on the teachers' annual income. Teachers were asked whether they think that higher salaries ensure better professional practice among teachers to which teachers in private and public schools had differing opinions. Teachers in the public schools believed that higher income is a reflection of more experience and qualifications resulting in better professional practice. However, in private schools, teachers believed that higher income is not connected to one's professional practice. According to the young teachers when high salaries are offered to experienced teachers, it might not elicit professional practice but at the same time, if trained young teachers are paid high salaries, it motivates them to grow professionally and perform better. Young teachers in private schools' favor performance-based pay structure rather than experience and qualification being the only criteria. On the other hand, experienced teachers and specialist teachers in the public schools are quite satisfied with the salary structure of the government. They don't believe that there is any need for a performance-based pay structure in their profession.

School principals had a divided opinion on the perceived effectiveness of performance-based pay systems. Some principals believed that a performance-based pay system can act as a revolutionary measure towards uplifting the performance of young teachers, at the same time, some school principals opined that a performance-based pay system doesn't need to work positively for teachers. It can rather harm the self-esteem of teachers facing a large number of barriers and are also suffering from a lack of exposure, resources, filial or social support.

4.2.5 Job Designation and Professionalism

Job designation of teachers within their educational institute was found to be an important characteristic based on which the professionalism of teachers varied. The designation of teachers and the assignment criteria of these designations varied in public and private schools. With the clear rule of designation assignment followed in public schools, the assignment criteria varied in the private schools. While in public schools, the designation of teachers teaching the secondary grades was either TGT (Trained Graduate Teacher) or PGT (Post Graduate Teacher). On the other hand, in private schools, not all teachers were trained. Untrained teachers were often appointed on the designation of Assistant Teachers. The roles and responsibilities of assistant teachers were no different than any of the other trained teachers but still, their salary was quite less when compared to trained teachers. When asked about their same roles and responsibilities but different salary packages and their effect on their practices, the teachers opined that without a doubt it serves as a discouragement for them often causing frustration. They however do not believe that their practice gets affected because of the difference but it does hamper the autonomy they are invested within the institution. Because of less autonomy, their functioning in the school becomes quite inhibited where they face barriers in using development opportunities. Due to less number of trained teachers, untrained teachers often serve as economical substitution of trained teachers in private schools who share a large burden of responsibility without much autonomy and opportunities for growth. These teachers can only resort to put efforts and to somehow succeed in teacher training exams while fulfilling their duties at work to become eligible for job security and better compensation.

4.2.6 Professional Development and Professionalism

Professional Development refers to the formal pre-service teacher training completed by the teacher and the in-service teacher training completed by them as a part of their Continuous Professional Development (CPD). Under this theme teachers' opinions pertaining to the quality of these trainings; the discrepancy in training and practice and the ease of access and opportunity to engage in CPD were enquired. The teachers reported that the pre-service training did not fully comply with the actual roles and responsibilities of their job. The most urgent reform as viewed by the teachers is the need for digital training. The teachers particularly reported a lack of skills in using language laboratories for teaching, using basic audio-visual platforms for teaching mathematics and science, and use of digital tools for assistance in the accomplishment of curricular tasks like time-table creation, lesson planning, etc. The teachers also expressed inadequacy of pre-service teacher training in inculcating skills like identifying students with learning difficulties, developing inclusive curriculum designs, and counseling. They have referred to the training received by them pertaining to classroom management as "superficial" which does not help teachers in real-life situations and negatively affects their professional competency.

Regarding in-service teacher training, all the teachers in public schools reported that they only attend what is compulsory and cannot find time to engage in CPD programs voluntarily. On the other hand, in private schools, many of the teachers teaching the secondary and higher secondary grades engaged in CPD voluntarily provided that their school principal allows them the time to do so. For schools where the number of teachers is less, teachers find it difficult to leave the school and engage in such programs

voluntarily. However, some school principals realized the importance of the professional growth of teachers and facilitated their journeys as much as they can by rearranging their time-tables, allowing study leaves, and also arranging for temporary teaching staff at the time of their teachers' examination/training. When it comes to engaging with in-service CPD, the role played by the principal and the peers in creating a facilitating environment was seen to be a crucial one.

4.2.7 Barriers of Professionalism of Teachers

The teachers were asked about the barriers they face in school which hamper their professionalism process. In the government schools, teachers opined that the biggest barrier in their professional practice was their engagement in additional administrative responsibilities. Due to this, the time that the teachers should be spending with students inside the classroom often gets wasted with engagement in administrative duties assigned to the teachers both at the school and the district level. The teachers in public schools strongly believe that the biggest reason behind the underperformance of public-school students, when compared to private school students, is that the teachers are not able to dedicate enough time to teaching-learning in school. Almost half of their daily consumed in arranging mid-day meals for students which involves procuring groceries and cooking food. Teachers can't even think of taking extra classes on days when the school is off because they have other duties assigned to them on these days. The interaction between students and teachers becomes quite less due to this barrier. This concern was seriously pointed out by teachers of public schools across all the blocks from where the data was collected. Also, on a regular basis during elections, census etc. the time teachers are expected to be in class, they can be often seen collecting data, fulfilling duties as BLO.

On being asked whether such activities help them knowing and interacting with the community better, the teachers opined that it hardly helps, and also even if it is beneficial it proves as an obstruction in the discharge of their primary duties as teachers. On the other hand, private school teachers and principals were very particular about the fruitful utilization of teachers' time in the classroom. Although less in number but as compared to public school teachers, private school teachers more frequently engaged in professional development activities and workshops.

The teachers both in the public and private schools believed that for their professionalism working with the community, exercising autonomy, engaging in professional development are all important aspects but the most crucial aspect is interaction with students. When they interact with the students, it not only promotes better learning in students but also improves their teaching practice.