CHAPTER- IV

DATA ANALYSIS AND INTERPRETATION

4.1 Introduction

The data analysis process entails the organization, structuring, and interpretation of extensive obtained data. It is a process that is simultaneously innovative and captivating, yet also chaotic, uncertain, and labour-intensive. It lacks organization and does not adhere to a linear path. Data analysis is a technique designed to ascertain the link among types of data. C.R. Kothari (1989) defines analysis as the calculation of measures and the exploration of relational patterns within data sets.

The analysis and interpretation of data are the fundamental cornerstones of any investigation. It entails analysing the tabulated data to ascertain the intrinsic facts. To generate accurate influence, data must be processed and analysed. Analysis is a methodical process of deconstructing the entire dataset into distinct components. Data analysis and interpretation are the primary and critical processes in the research process following data gathering. The researcher derives a conclusion from the collected data through interpretation. Interpretation serves as the mechanism by which the elements that elucidate the investigator's observations in the study can be comprehensively understood. Interpretation also offers a theoretical framework that can guide future research. This chapter delineates the research findings obtained from the analysis of quantitative and qualitative data. Data was gathered through the administration of the Academic Resilience Scale and the Classroom Engagement Scale. The Academic Resilience Scale was created by M. Dsouza and S. Pandya (2017), whereas the Classroom Engagement Scale was established by the investigator herself. The investigator also devised an Observation Schedule to assess the engagement of pre-service instructors. Academic achievement is assessed based on the final examination scores of pre-service teachers obtained from their separate teacher education institutions. A test was administered to 895 pre-service teachers from various districts of Assam concerning gender, locality, stream, and types of institution. The investigator determines the total sample size. Karl Pearson's Product Moment Correlation and Regression are utilized to ascertain the relationship between dependent and independent variables. A graphical representation of the distribution was also provided. The chapter comprises the subsequent sections:

4.2 Normality of data

The normality of the data distribution test was performed first, before proceeding with any further investigation. This is done to determine which statistical tests would be the most appropriate for the dataset (Best and Kahn, 2003; Blanca, Arnau, Lopez-Montiel, Bono and Bendayan, 2013). The normality test results are shown in Table 4.1.1. To illustrate the graphical distribution of the data, Fig. 4.1.1. (a) and (b) show the Histogram, Normal Q-Q Plot.

Table 4.1.1

Descriptive Statistics related to Academic Resilience

Variable	N	Mean	SD	Skewness	Kurtosis
Academic Resilience	895	129.63	10.32	-.103	-.379

The collected raw data was tabulated to present the data systematically and orderly. Table4.1.1 indicates the overall Academic Resilience of Pre-service teachers of Assam. The measure tendency mean is 129.63. The standard deviation of the sample was found to be 10.32. The value of Skewness and Kurtosis, i.e., -.103 and -.379 respectively, which lie between -2 and above +2, are regarded acceptable range for skewness or kurtosis. (George&Mallery,2010). According to the result, the distribution is normal.

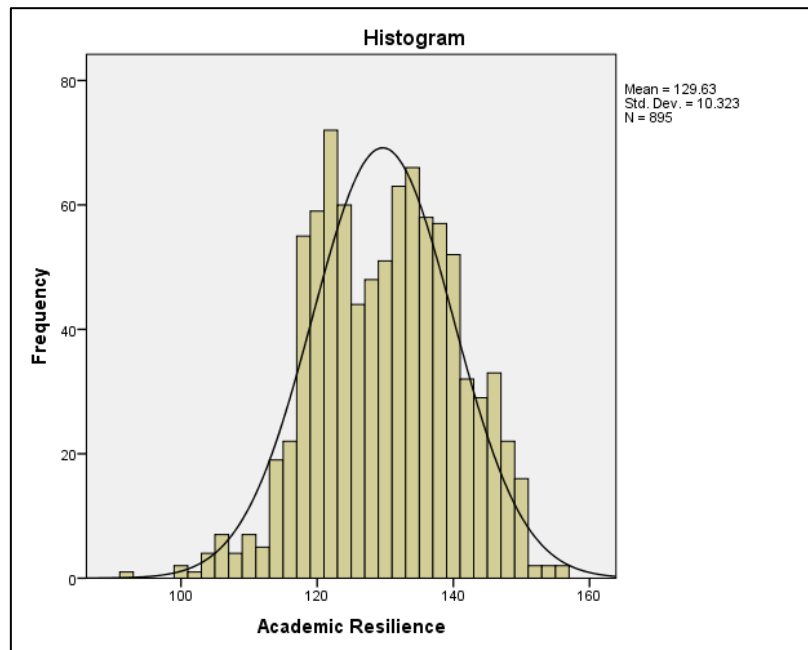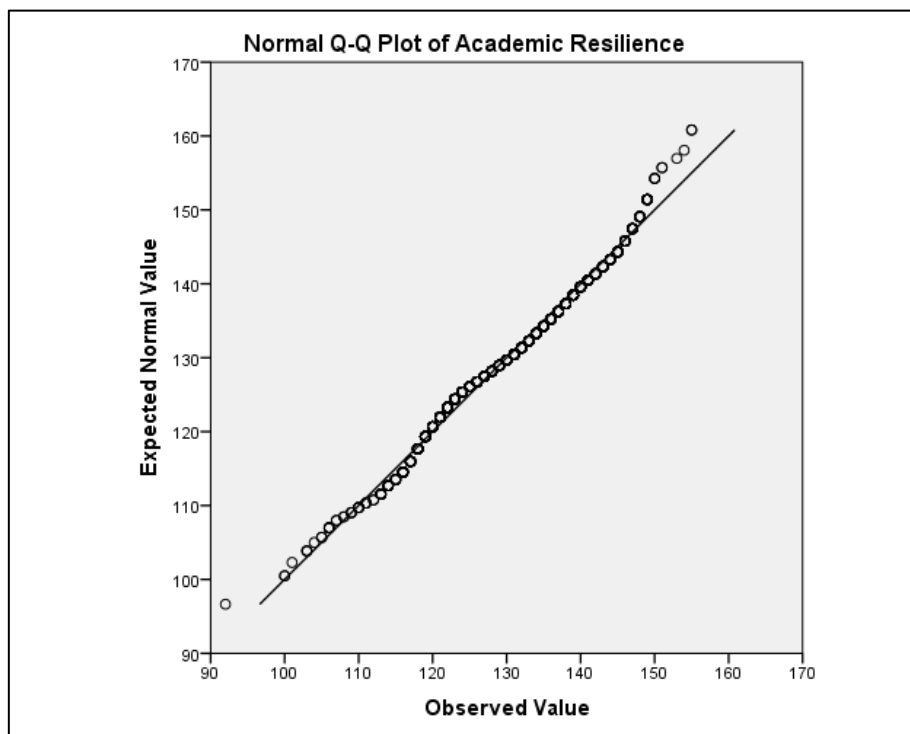**Figure 4.1.1(a) Graphical representation of the Academic Resilience**

Figure 4.1.1(b) Graphical representation of the Academic Resilience

**4.3 Data analysis and interpretation of Objective no 1**

To study the level of Academic Resilience of the Pre-service teachers of Assam

Table 4.1.2

Levels of the Academic Resilience of Pre-Service Teachers

Sr. No	Range of Raw scores	Levels of Academic Resilience	Frequency	Percentage
1	145 & above	Extremely high	80	8.85%
2	127-144	High	455	50.38%
3	108-126	Above average	343	37.98%
4	82-107	Average	17	1.88%
5	63-81	Below average	0	0%
6	45-62	Low	0	0%
7	44& below	Extremely low	0	0%
		Total	895	100%

Fig. 4.1.2. Graphical representation of percentages of sample belonging to different levels of Academic Resilience
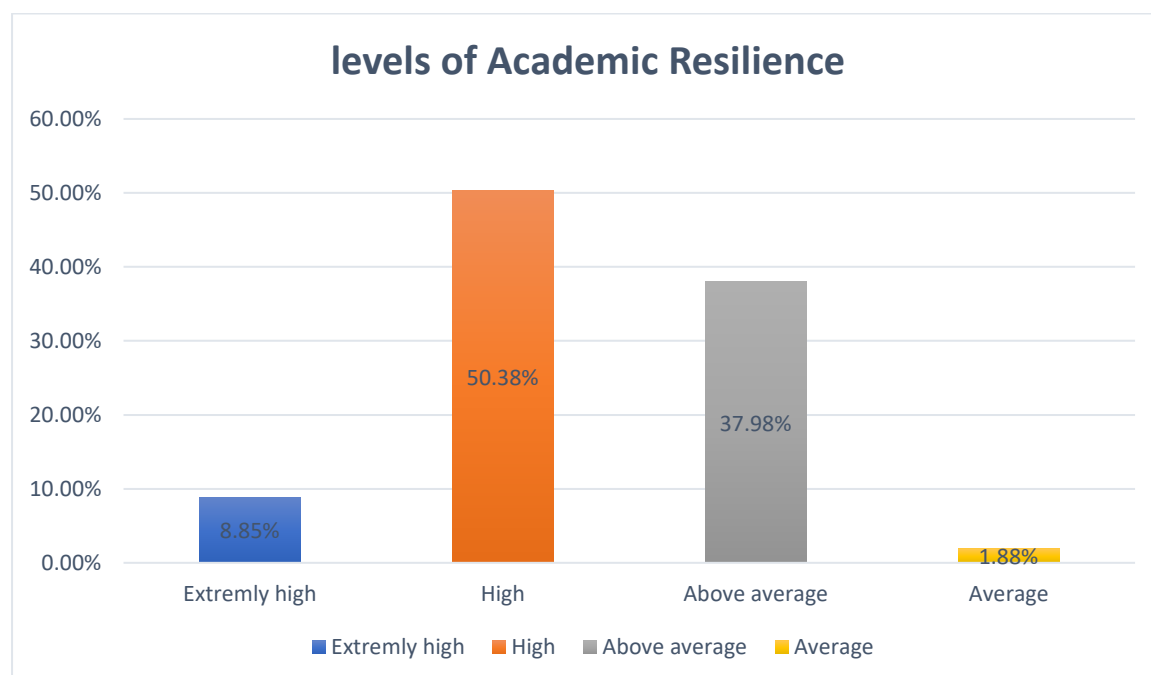
The data presented in table 4.1.2 and figure 4.1.2 shows the distribution of the Academic Resilience of Pre-service teachers of Assam. Out of 895 Pre-service teachers ,80 Pre-service teachers have extremely high Academic Resilience. 455 Pre-service teachers exhibit a high level of Academic Resilience. Further analysis of the data reveals 343 Pre- service teachers report above average level of Academic Resilience. Again, 17 Pre-service teachers show average Academic Resilience.

Overall, the findings from the analysis shows that 50.38% Pre-service teachers have high levels of Academic Resilience.37.98% have above average level of Academic Resilience. 8.85% shows extremely high levels of Academic Resilience.1.88% Pre-service teachers have average Academic Resilience. It was observed that the greatest number of Pre-service teachers i. 50.38%, i.e. falls in the high Academic Resilience category and only 8.85% have extremely high Academic Resilience.

4.4 Data analysis and interpretation objective no 2

Objective 2(i) To find out over all significant difference in Academic Resilience of the Pre-service teachers of Assam based on Gender

H₀1 There is no significant mean difference in Academic Resilience of Pre-service teachers of Assam in regards to Gender
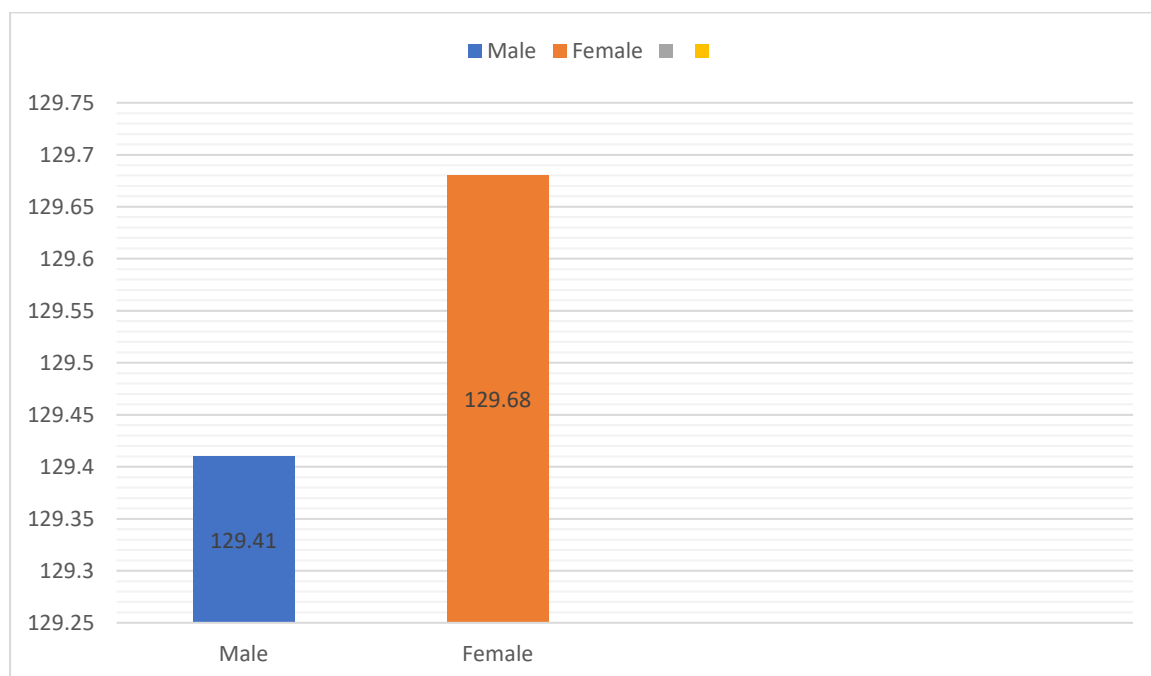
Table 4.1.3

t value of Academic Resilience of Pre-service teachers in regard to Gender

Gender	N	Mean	SD	Df	t-value	Sig (2-tailed)	Remarks
Male	182	129.68	10.37	893	.314	.753	Not Significant
Female	713	129.41	10.15				

 *Significance at 0.05% level

Fig 4.1.3

Mean scores of Academic Resilience of the Pre-service teachers with regard to their Gender

From the table 4.1.3 and figure 4.1.3 it is evident that the mean of male and female Pre-service teachers is 129.68 and 129.15 and their S.D. is 10.37 and 10.15 respectively. The calculated 't' value (.314) found out to be less than the table 't' value (1.647) at 0.05 level of significance for two tailed test and degrees of freedom 893.

Hence, there is no significant mean difference in the Academic Resilience of male and female Pre-service teacher at 0.05 significance level. So, the hypothesis "There is no significant mean difference in Academic Resilience of Pre-service teachers of Assam in regards to Gender" is accepted.

Objective 2(ii) To find out over all significant difference in Academic Resilience of the Pre-service teachers of Assam teachers based on Locality

H$_0$2 There is no significant mean difference in Academic Resilience of Pre-service teacher of Assam in regards to locality
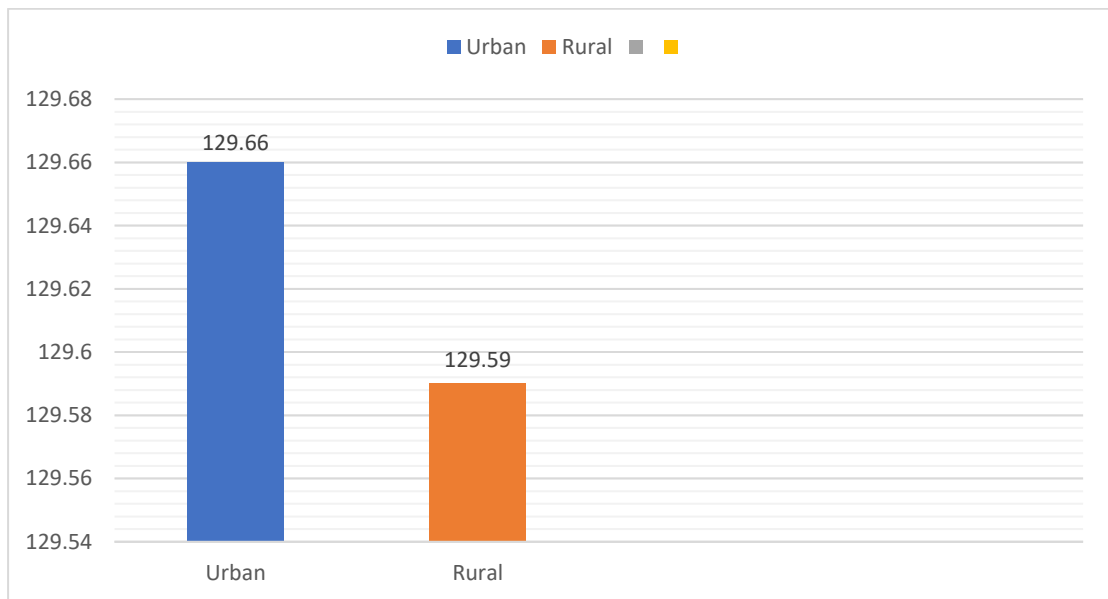
Table 4.1.4

t value of the Academic Resilience of Pre-service teachers of Assam in terms of Locality

Locality	N	Mean	SD	Df	t-value	Sig (2-tailed)	Remarks
Urban	495	129.66	10.34	893	.096	.792	Not significant
Rural	400	129.59	10.30				

*Significance at 0.05% level

Figure 4.1.4

Mean score of Pre-service teachers Academic Resilience regards to locality

From the table 4.1.4 and figure 4.1.4, it is evident that the mean score of Pre-service teachers from Urban and Rural area is 129.66 and 129.59 and their S.D. is 10.34 and 10.30 respectively. The calculated 't' value (.096) found out to be less than the table

119

't' value (1.647) at 0.05 level of significance for two tailed test and degrees of freedom 893.

Hence, there is no significant mean difference in the Academic Resilience of Pre-service teachers from Urban and Rural area at 0.05% significance level. So, the hypothesis "There is no significant mean difference in Academic Resilience of Pre-service teacher of Assam in regards to locality" is accepted.

Objective 2(iii) To find out over all significant difference in Academic Resilience of the Pre-service teachers of Assam teachers based on Stream

H_03 There is no significant mean difference in Academic Resilience of Pre-service teachers from Assam in regards to Stream

To find out the difference in the mean scores in Academic Resilience of Pre-service teachers of Assam with regard to different stream, they were divided into two categories (group) based on the Stream such as Science and Arts. To test the hypothesis t test is performed.
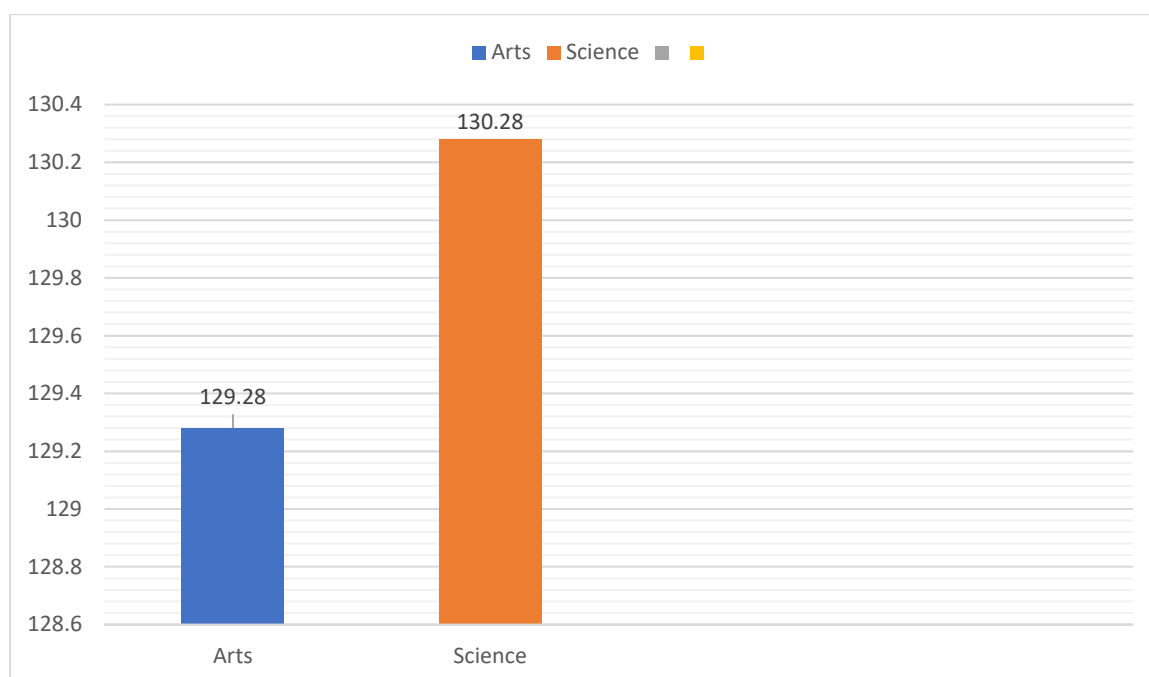
Table 4.1.5

Comparison of the Academic Resilience of Pre-service teachers of Assam in regards to Stream

Stream	N	Mean	SD	Df	t-value	Sig (2-tailed)	Remarks
Arts	585	129.28	10.53	893	-1.38	.168	Not significant
Science	310	130.28	9.89				

*Significance at 0.05% level

Figure 4.1.5

Mean score of Pre-service teachers Academic Resilience regards to stream

From the table 4.1.5 and figure 4.1.5, it is evident that the mean of Arts and Science Pre -service teachers is 129.28 and 130.28 and their S.D. is 10.53 and 9.89 respectively. The calculated 't' value (-1.38) found out to be less than the table 't' value (1.647) at 0.05 level of significance for two tailed test and degrees of freedom 893.

Hence, there is no significant mean difference in the Academic Resilience of Pre-service teachers from Arts and Science stream at 0.05 significance level. So, the hypothesis "There is no significant mean difference in Academic Resilience of Pre-service teachers from Assam in regards to Stream" is accepted.

Objective 2(iv) To find out over all significant difference in Academic Resilience of the Pre-service teachers of Assam teachers based on Types of institution

H₀4 There is no significant mean difference in Academic Resilience of Pre-service teacher s of Assam in regards to Types of institution

To find out the difference in the mean scores in Academic Resilience of Pre-service teachers of Assam with regard to types of institution, they were divided into two

categories (group) based on Types of institution such as Private and Government and to test the hypothesis t test is performed.
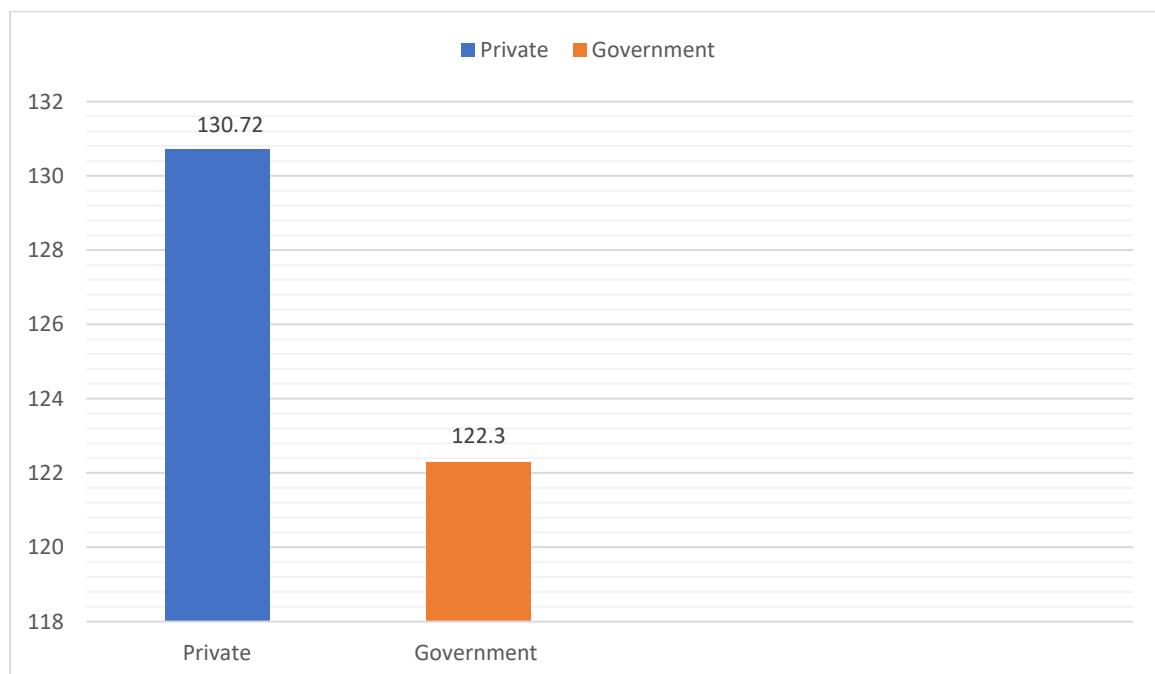
Table 4.1.6

t value of the Academic Resilience of Pre-service teachers of Assam in regards to Types of institution

Types of Institution	N	Mean	SD	Df	t-value	Sig (2-tailed)	Remarks
Private	779	130.72	10.20	893	8.51	.000	Significant
Government	116	122.30	7.83				

*Significance at 0.05%

Figure 4.1.6

Mean score of Pre-service teachers Academic Resilience regards to Types of institution

From the table4.1.6 and figure 4.1.6, it is evident that the mean of Pre-service teachers from Private and Government in terms of Academic Resilience is 130.72 and 122.30

and their S.D. is 10.20 and 7.83 respectively. The calculated 't' value (8.51) found out to be more than the table 't' value (1.647) at 0.05 level of significance for two tailed test and degrees of freedom 893.

Hence, there is significant mean difference in the Academic Resilience of Pre-service teachers from Private and Government Teacher Education institution at 0.05 significance level. So, the hypothesis "There is no significant mean difference in Academic Resilience of Pre-service teacher s of Assam in regards to Types of institution" is rejected.

4.5 Analysis and interpretation Objective no 3

To find out dimension wise significant difference in Academic Resilience of the Pre-service teachers of Assam teachers based on Gender

H$_0$5 There is no significant difference in the mean difference in i) Self efficacy ii) Social support and Social competence of Pre-service teachers of Assam teachers in regards to Gender
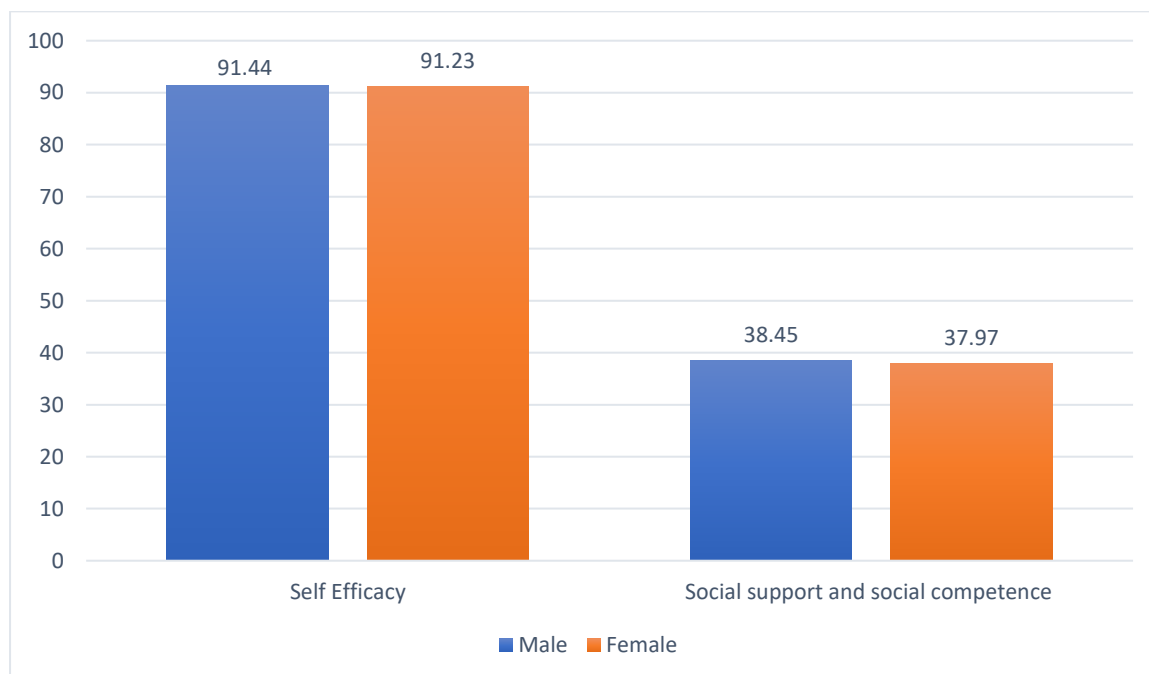
Table 4.1.7

Dimension-wise t value of Academic Resilience among Pre-service teachers of Assam teachers in regards to Gender

Dimensions Of Academic Resilience	Gender	N	Mean	SD	t value
Self-efficacy	Male	182	91.44	7.49	-.338
	Female	713	91.23	7.08	
Social support and Social competence	Male	182	38.45	4.47	1.29
	Female	713	37.97	4.41	

*Significance at 0.05% level

Fig 4.1.7

Dimension wise Mean score of Pre-service teachers Academic Resilience regards to gender

In the above table 4.1.7 An independent samples t-test is performed to compare the Self efficacy between male and female Pre-service teachers regarding the various dimensions. There is no significant differences in the first dimension i.e. Self-efficacy based on gender as the findings showed t value (-.338) is less than the Table t (1.67). Hence the hypothesis "There is no significant difference in the mean difference in Self efficacy of Pre-service teachers of Assam teachers in regards to Gender "is accepted.

Similarly, the table 4.1.7 showed a no significant difference in terms of gender concerning Social support and social competence with t value (1.29) i. e less than table t value (1.67). Hence the hypothesis "There is no significant difference in the mean difference in Social support and Social competence of Pre-service teachers of Assam teachers in regards to Gender" is accepted.

Objective3(ii) To find out dimension wise significant difference in Academic Resilience of the Pre-service teachers of Assam teachers based on Locality

H₀6 There is no significant difference in the mean difference in i) Self efficacy ii) Social support and Social competence of Pre-service teachers of Assam teachers in regards to locality

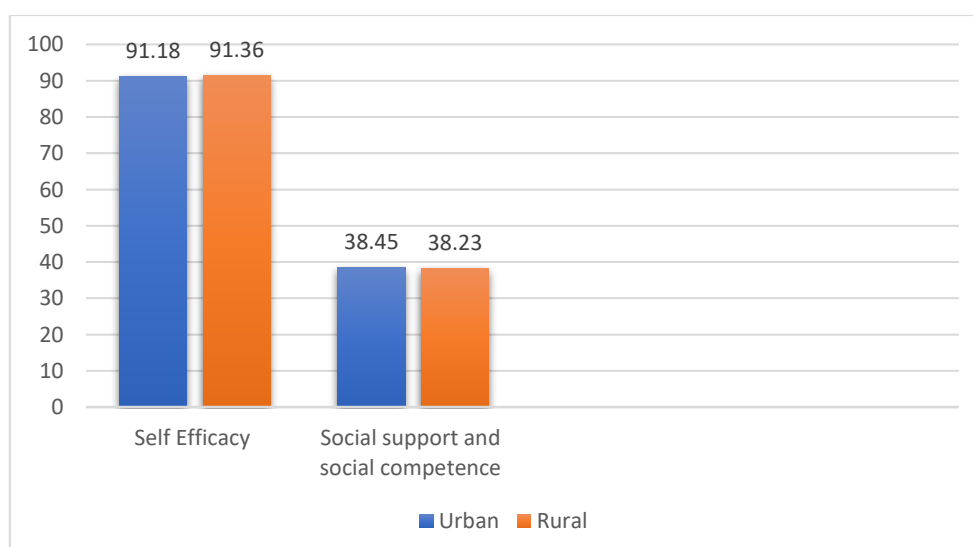<p style="text-align:center">Table 4.1.8</p>

<p style="text-align:center">Dimension-wise Academic Resilience among Pre-service teachers of Assam teachers in regards to Locality</p>

Dimensions Of Academic Resilience	Locality	N	Mean	SD	t value
Self-efficacy	Urban	495	91.18	7.21	-.322
	Rural	400	91.36	7.65	
Social support and social competence	Urban	495	38.45	4.33	.757
	Rural	400	38.23	4.60	

*Significance at 0.05% level

<p style="text-align:center">Fig 4.1.8</p>

<p style="text-align:center">Dimension wise Mean score of Pre-service teachers Academic Resilience regards to locality</p>

The table 4.1.8 and figure 4.1.8 it has been found no significant differences in the first dimension based on locality as the findings showed t value (-.322) is less than the Table t (1.67). Hence the hypothesis "There is no significant difference in the mean difference in Self efficacy of Pre-service teachers of Assam teachers in regards to locality" is accepted.

Similarly, the table 4.1.8 and figure 4.1.8 showed a no significant difference in terms of locality concerning Social support and Social competence with t value (.757) i. e less than table t value (1.67). Hence the hypothesis "There is no significant difference in the mean difference in Social support and Social competence of Pre-service teachers of Assam teachers in regards to locality" is accepted.

Objective 3(iii) To find out dimension wise significant difference in Academic Resilience of the Pre-service teachers of Assam teachers in regard to their Stream

$H_0$7 There is no significant difference in the mean difference in i) Self efficacy ii) Social support and Social competence of Pre-service teachers of Assam teachers in regards to Stream
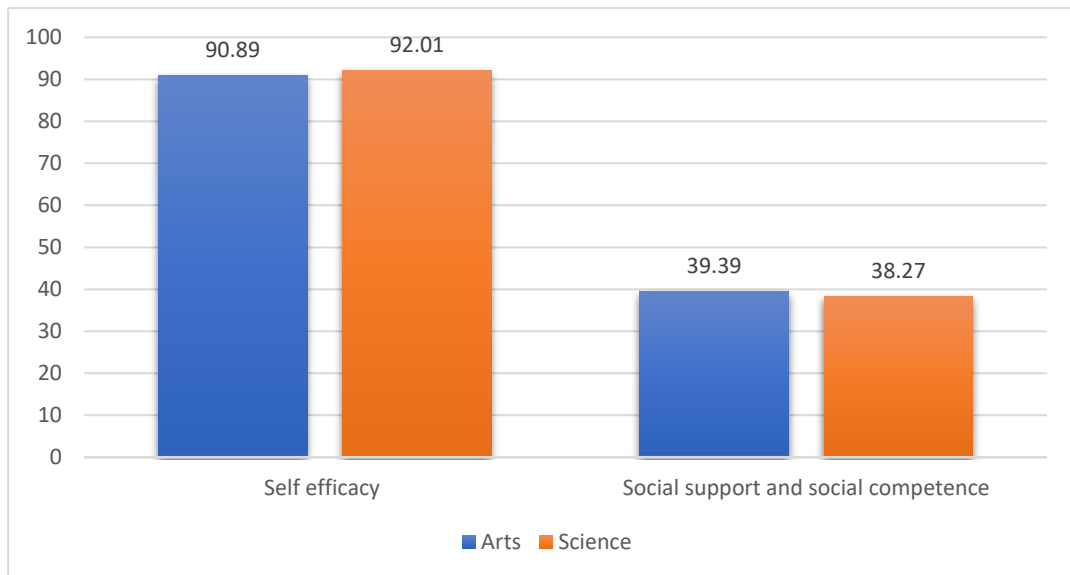
Table 4.1.9

Dimension wise Academic Resilience of Pre-service teacher in terms of Stream

Dimensions Of Academic Resilience	Management of institution	N	Mean	SD	t value
Self-efficacy	Arts	585	90.89	7.55	-2.15
	Science	310	92.01	7.09	
Social support and social support	Arts	585	38.39	4.49	.385
	Science	310	38.27	4.40	

*Significance at 0.05% level

Fig 4.1.9

Dimension wise Mean score of Pre-service teachers Academic Resilience regards to stream

From the table 4.1.9 and figure 4.1.9 it has been found no significant differences in the first dimension based on stream as the findings showed t value (-2.158) is less than the Table t (1.67). Hence the hypothesis "There is no significant difference in the mean difference in Self efficacy of Pre-service teachers of Assam teachers in regards to Stream" is accepted.

Similarly, the table 4.1.9 and figure 4.1.9 showed a no significant difference in terms of stream concerning Social support and Social competence with t value (.385) i. e less than table t value (1.67). Hence the hypothesis "There is no significant difference in the mean difference in Social support and Social competence of Pre-service teachers of Assam teachers in regards to Stream"" is accepted.

Objective 3(iv) To find out dimension wise significant difference in Academic Resilience of the Pre-service teachers of Assam teachers in regard to their Types of institution

H₀8 There is no significant difference in the mean difference in i. Self-efficacy ii. Social support and Social competence of Pre-service teachers of Assam teachers in regards to Types of institution
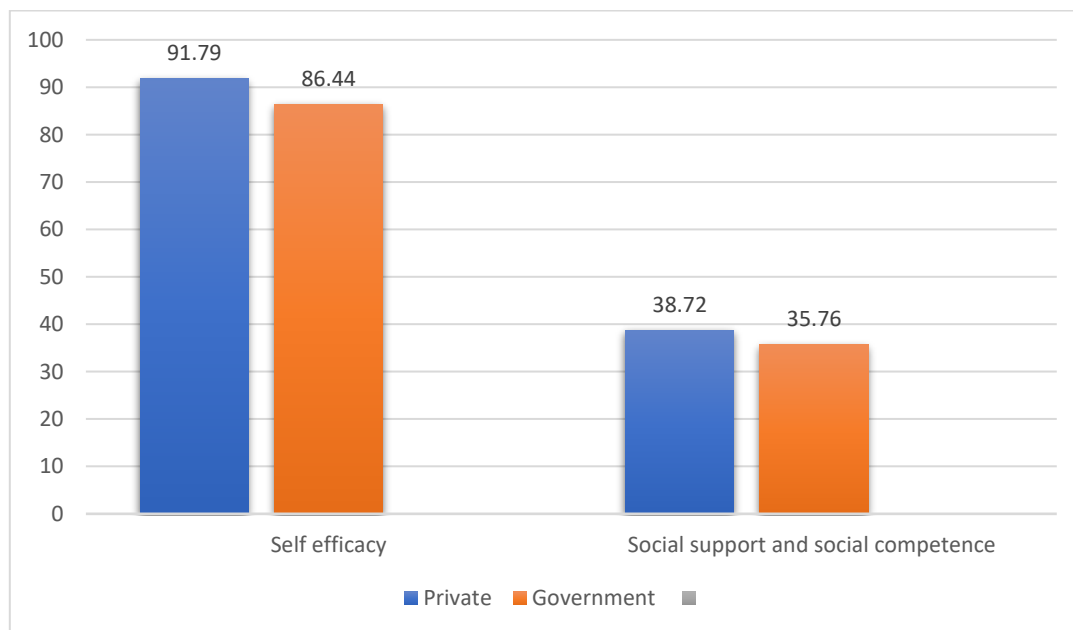
Table 4.1.10

Dimension-wise t value of Academic Resilience among Pre-service teachers of Assam teachers in regards to Types of institution

Dimensions Of Academic Resilience	Types of institution	N	Mean	SD	t value
Self-efficacy	Private	779	91.99	7.3	7.77
	Government	116	86.44	6.1	
Social support and Social competence	Private	779	38.72	4.5	6.69
	Government	116	35.76	3.1	

*Significance at 0.05% level

Fig 4.1.10

Dimension wise Mean score of Pre-service teachers Academic Resilience regards to Types of institution

From the table 4.1.10 and figure 4.1.10 it has been found significant differences in the first dimension based on institution as the findings showed t value (7.77) is greater than the Table t (1.67). Hence the hypothesis "There is no significant difference in the mean difference in i. Self-efficacy of Pre-service teachers of Assam teachers in regards to Types of institution" is rejected.

Similarly, the table 4.1.10 showed a significant difference in terms of institution concerning Social support and Social competence with t value (6.59) i. e greater than table t value (1.67). Hence the hypothesis "There is no significant difference in the mean difference in Social support and Social competence of Pre-service teachers of Assam teachers in regards to Types of institution" is rejected.

4.6 Normality of data

Descriptive statistics like mean, standard deviation, skewness, and kurtosis were found to test the normality of scores for Classroom Engagement. This is done to determine which statistical tests would be the most appropriate for the dataset (Best and Kahn, 2003; Blanca, Arnau, Lopez-Montiel, Bono and Bendayan, 2013). The normality test results are shown in Table 4.1.11. To illustrate the graphical distribution of the data, Fig. 4.1.11 (a) and (b) show the Histogram, Normal Q-Q Plot.

Table 4.1.11(a)

Descriptive statistics related to Classroom Engagement

Variable	N	Mean	SD	Skewness	Kurtosis
Classroom Engagement	895	101.15	11.32	.132	-.947

The collected raw data was tabulated to present the data systematically and orderly. Table indicates the overall Classroom Engagement of Pre-service teachers of Assam. The measure tendency mean is 101.15. The standard deviation of the sample was found to be 11.32. The value of Skewness and Kurtosis, i.e., .132 and -.947 respectively, which lie between -2 and above +2, are regarded acceptable range for

skewness or kurtosis. (George&Mallery,2010).   According to the result, the distribution is normal.

Figure 4.1.11(a) Graphical representation of the Classroom Engagement
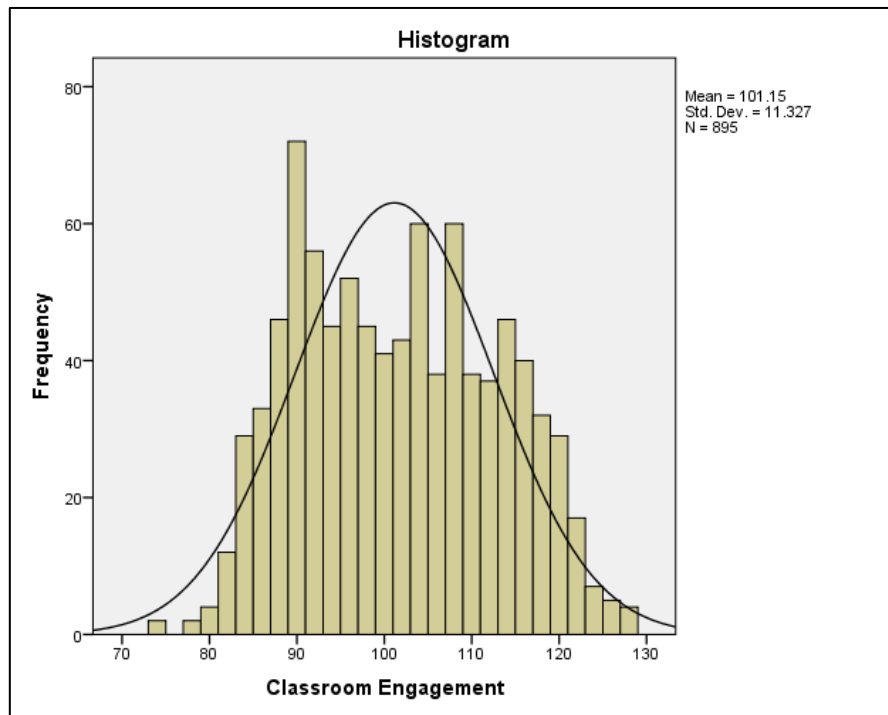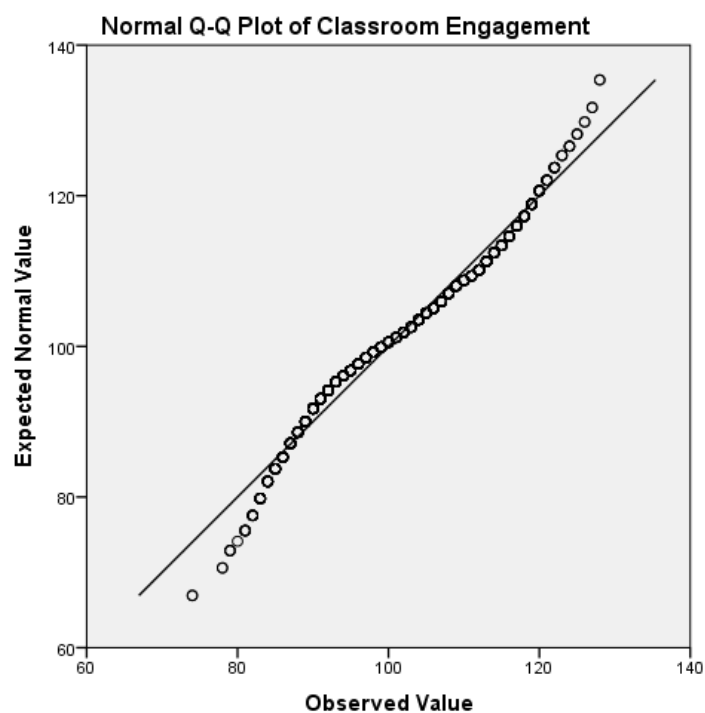

Figure 4.1.11(b) Graphical representation of the Classroom Engagement

4.7 Data analysis and interpretation of Objective no 4

To study the level of Classroom Engagement of the Pre-service teachers of Assam

To measure the level of Classroom Engagement possessed by each sample, the total 895 Pre-service teachers from Assam in relation to Gender, Locality, Stream, and types of institution. These are represented in the following table –

Table 4.1.12

Levels of the Classroom Engagement of Pre-service teachers

Sr. No	Range of raw scores	Levels of Classroom Engagement	Frequency	Percentage
1	110& above	Very high	62	6.86%
2	96 to 118	High	505	55.92%
3	73 to 95	Average	328	36.62%
4	50 to 72	Low	0	0%
5	49 and below	Very low	0	0%
	Total		895	100%

Fig4.1.12 Levels of Classroom Engagement
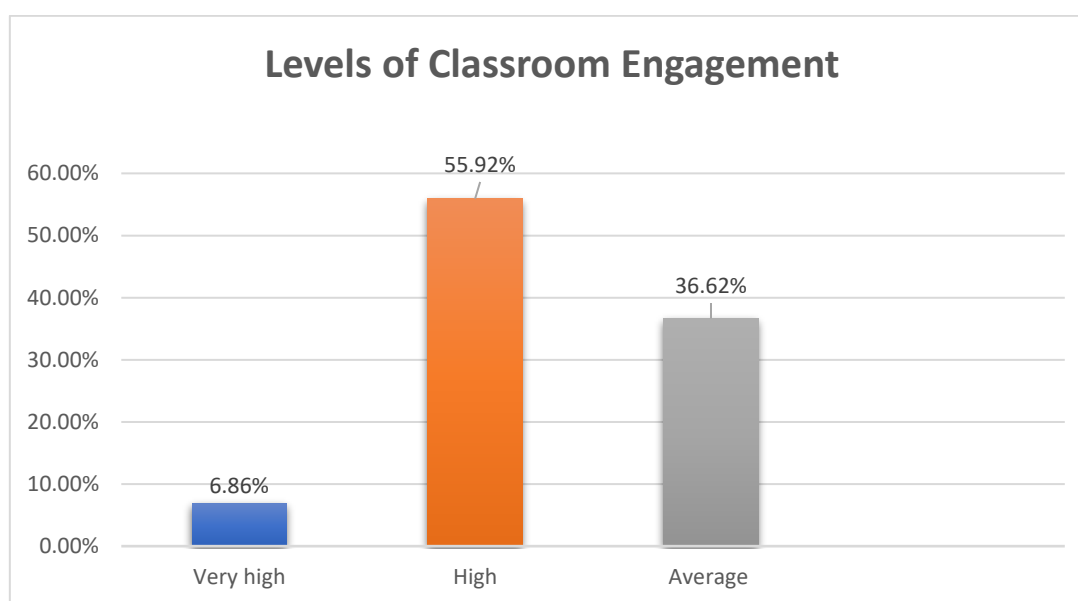
The data presented in table 4.1.12 and figure 4.1.12 shows the distribution of the Classroom Engagement of Pre-service teachers of Assam. Out of 895 Pre-service

teachers ,62 Pre-service teachers have very high Classroom Engagement. 505 Pre-service teachers exhibit a high level of Classroom Engagement. Further analysis of the data reveals 328 Pre- service teachers report average level of Classroom Engagement.

Overall, the findings from the analysis shows that 6.86% have very high level of Classroom Engagement .55.92% Pre-service teachers have high levels of Classroom Engagement.36.62% have average level of Classroom Engagement. So, the Classroom Engagement of the Pre-service teachers is high.

4.8 Data analysis and interpretation of Objective no 5

5(i) To find out over all significant difference in Classroom Engagement of the Pre- service teachers of Assam teachers in regard to their Gender

$H_0 9$ There is no significant mean difference in Classroom Engagement of Pre-service teachers of Assam in regards to Gender
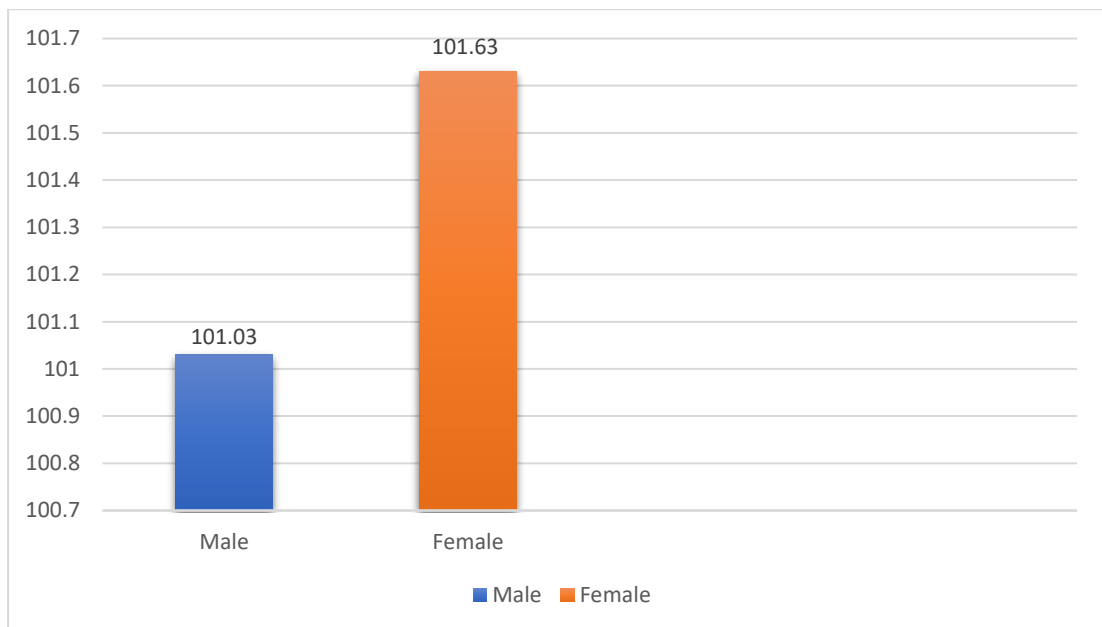
Table 4.1.13

t value of Classroom Engagement of Pre-service teachers of Assam in relation to Gender

Gender	N	Mean	SD	Df	t-value	Sig (2-tailed)	Remarks
Male	182	101.03	11.14	893	-.630	.529	Not significant
Female	713	101.63	11.04				

*Significance at 0.05% level

132

Fig4.1.13

Mean score of Pre-service teachers Classroom Engagement regards to Gender

From the table 4.1.13 and figure 4.1.13, it is evident that the mean of male and female Pre -service teachers is 101.03 and 101.63 and their S.D. is 11.14 and 11.04 respectively. The calculated 't' value (-.630) found out to be less than the table 't' value (1.647) at 0.05 level of significance for two tailed test and degrees of freedom 893.

Hence, there is no significant mean difference in the Classroom Engagement of male and female Pre-service teachers at 0.05 significance level. So, the hypothesis "There is no significant mean difference in Classroom Engagement of Pre-

service teachers of Assam in regards to Gender" is accepted.

Objective no 5(ii) To find out over all significant difference in Classroom Engagement of the Pre-service teachers of Assam teachers in regard to their Locality

H$_0$10 There is no significant mean difference in Classroom Engagement of Pre-service teachers of Assam in regards to locality

Table 4.1.14

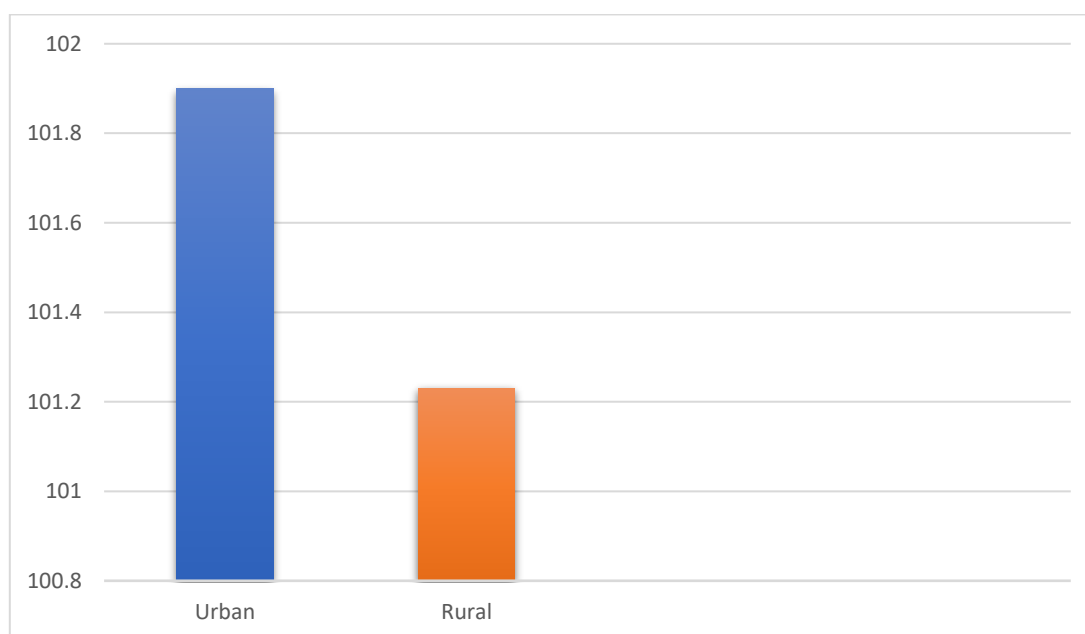**t value of Classroom Engagement of Pre-service teachers of Assam in regards to locality**

Locality	N	Mean	SD	Df	t-value	Sig (2-tailed)	Remarks
Urban	495	101.90	10.34	893	2.19	.028	Significant
Rural	400	101.23	11.24				

*Significance at 0.05% level

Fig4.1.14

Mean score of Classroom Engagement of Pre-service teachers in regards to their locality

From the table 4.1.14 and figure 4.1.14, it is evident that the mean of Urban and Rural Pre- service teachers is 101.90 and 101.23 and their S.D. is 10.34 and 11.24 respectively. The calculated 't' value (2.19) found out to be more than the table 't' value (1.647) at 0.05 level of significance and degrees of freedom 893.

Hence, there is significant mean difference in the Classroom Engagement of Pre-service teachers from Urban and Rural area at 0.05 significance level. So, the hypothesis "There is no significant mean difference in Classroom Engagement of Pre-service teachers of Assam in regards to locality" is rejected.

Objective no 5(iii) To find out over all significant difference in Classroom Engagement of the Pre-service teachers of Assam teachers in regard to their Stream

H$_0$11 There is no significant mean difference in Classroom Engagement of Pre-service teachers of Assam in regards to Stream

To find out the difference in the mean scores in Classroom Engagement of Pre-service teachers of Assam with regard to different stream, they were divided into two categories (group) based on the stream such as Arts & Science and to test the hypothesis t test is performed.
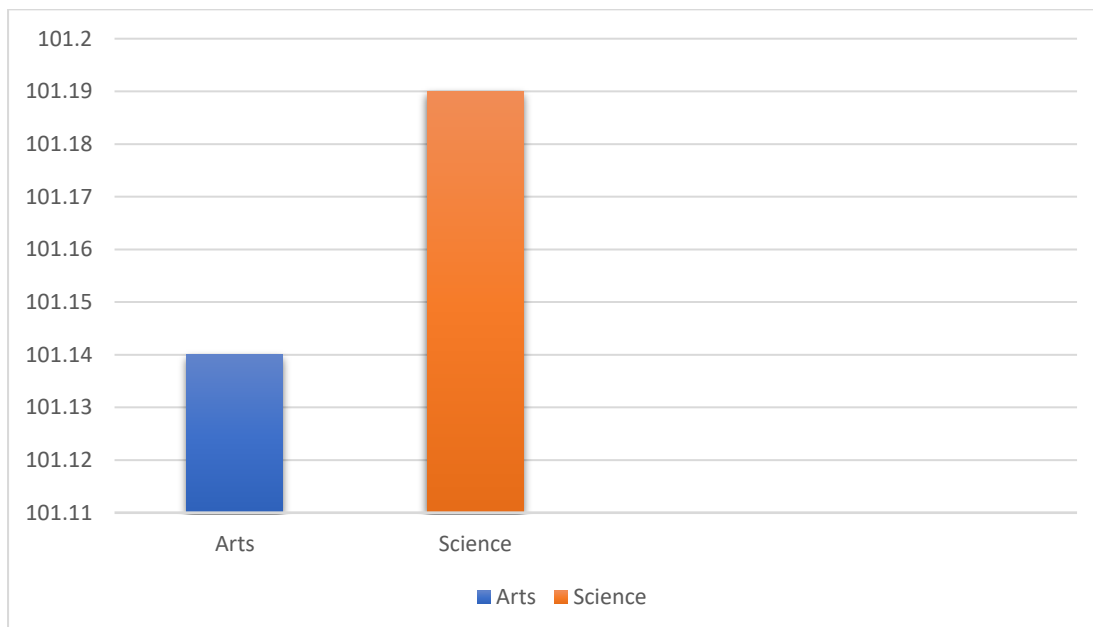
Table 4.1.15

Comparison of the Classroom Engagement of Pre-service teachers of Assam in regards to Stream

Locality	N	Mean	SD	Df	t-value	Sig (2-tailed)	Remarks
Arts	585	101.14	11.01				Not Significant
Science	310	101.19	11.92	893	-.069	.945	

*Significance at 0.05% level

135

Fig 4.1.15

Mean score of Classroom Engagement of Pre-service teachers in regard to stream

From the table 4.1.15 and figure 4.1.15, it is evident that the mean of Pre-service teachers from Arts and Science stream is 101.14 and 101.19 and their S.D. is 11.01 and 11.92 respectively. The calculated 't' value (-.069) found out to be less than the table 't' value (1.647) at 0.05 level of significance and degrees of freedom 893.

Hence, there is no significant mean difference in the Classroom Engagement of Pre-service teachers from Arts and Science stream at 0.05 significance level. So, the hypothesis "There is no significant mean difference in Classroom Engagement of Pre-service teachers of Assam in regards to Stream" is accepted

Objective no 5(iv) To find out over all significant difference in Classroom Engagement of the Pre-service teachers of Assam teachers in regard to their Types of institution

$H_0$12 There is no significant mean difference in Classroom Engagement of Pre-service teachers of Assam in regards to Types of institution
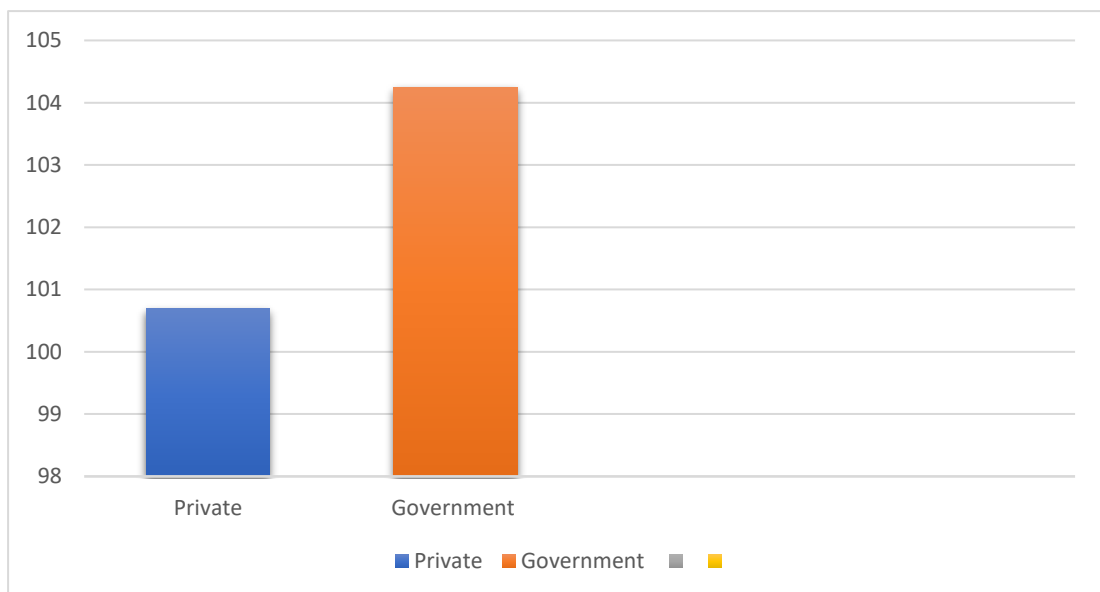
Table 4.1.16

t value of Classroom Engagement of Pre-service teachers of Assam in relation to Types of institution

Types of institution	N	Mean	SD	Df	t-value	Sig (2-tailed)	Remarks
Private	779	100.69	11.34	901	-3.16	.002	Not significant
Government	116	104.24	10.79				

*Significance at 0.05% level

Fig 4.1.16

Mean scores of Classroom Engagement of Pre-service teachers in regard to Types of institution

From the table 4.1.16 and figure 4.1.16, it is evident that the mean of Pre-service teachers from Private and Government in terms of Classroom Engagement is 100.69 and 104.24 and their S.D. is 11.34 and 10.79 respectively. The calculated 't' value (-3.16) found out to be less than the table 't' value (1.647) at 0.05 level of significance for two tailed test and degrees of freedom 893.

Hence, there is no significant mean difference in the Classroom Engagement of Pre-service teachers from Private and Government institution at 0.05 significance level. So, the hypothesis "There is no significant mean difference in Classroom Engagement of Pre- service teachers of Assam in regards to Types of institution" is accepted

4.9 Data Analysis and interpretation of objective no 6

Objective no 6(i) To find out dimension wise significant difference in Classroom Engagement of the Pre-service teachers of Assam teachers in regard to their Gender

H₀13 There is no significant mean difference in i) Cognitive Engagement ii) Emotional Engagement iii) Behavioural Engagement iv) Teaching skills Engagement of Pre-service teachers in regards to Gender

Table 4.1.17

Dimension wise t value of Academic Resilience of Pre-service teacher in regards to Gender

Dimensions	Gender	N	Mean	SD	t value
Cognitive Engagement	Male	182	38.65	4.83	.139
	Female	713	38.60	4.83	
Emotional Engagement	Male	182	19.31	2.88	-.654
	Female	713	19.46	2.81	
Behavioural Engagement	Male	182	26.57	4.09	-.647
	Female	713	26.79	4.00	
Teaching skills Engagement	Male	182	16.51	2.48	-1.35
	Female	713	16.78	2.24	

*Significance at 0.05% level

For better understanding these mean scores have been presented in the following figure:

Fig 4.1.17

Mean score of dimensions wise Classroom Engagement of Pre-service teachers of Assam in regard to gender
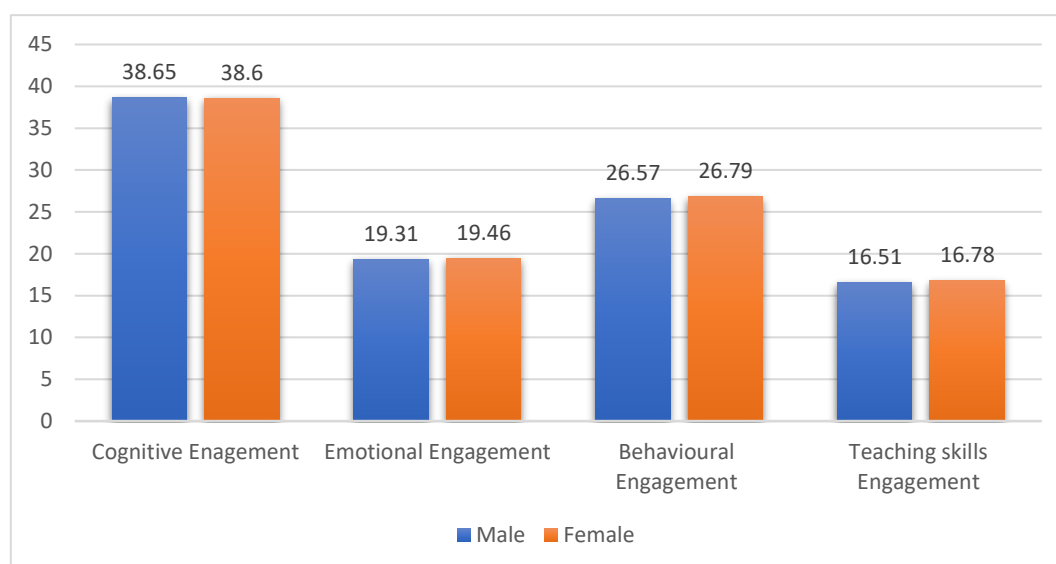
From the above table 4.1.17 and figure 4.1.17, it is observed that in terms of Cognitive Engagement, there exist no significant differences in the mean scores of male (M = 38.65, SD = 4.83, N = 182), Female (M = 38.60, SD = 4.83, N = 713) of Pre-service teachers of Assam. The calculated t value .139 is less than table value 1.647. Hence, the hypothesis "There is no significant mean difference in Cognitive Engagement of Pre-service teachers in regards to Gender" is accepted.

It is observed that in terms of Emotional Engagement, there exist no significant differences in the mean scores of male (M = 19.31, SD = 2.88, N = 182), female (M = 19.46, SD = 2.81, N = 713) Pre-service teachers of Assam. The calculated t value -.654 is less than table value 1.647. Hence, the hypothesis "There is no significant mean difference in Emotional Engagement of Pre-service teachers in regards to Gender" is accepted.

It is has been found that in terms of Behavioural Engagement, there exist no significant differences in the mean scores of male (M =26.57, SD = 4.09, N = 182), female (M = 26.79, SD = 4.00, N = 713) Pre-service teachers of Assam. The

calculated t value -.657 is less than table value 1.647. Hence, the hypothesis "There is no significant mean difference in Behavioural Engagement of Pre-service teachers in regards to Gender" is accepted.

It is observed that in terms of Teaching skills Engagement, there exist no significant differences in the mean scores of Male (M = 16.51, SD = 2.48, N = 182), Female (M = 16.78, SD = 2.24, N = 713). The calculated t value -1.351 is less than table value 1.647. Hence, the hypothesis is accepted "There is no significant mean difference in Teaching skills Engagement of Pre-service teachers in regards to Gender" is accepted.

Objective no 6(ii) To find out dimension wise significant difference in Classroom Engagement of the Pre-service teachers of Assam teachers in regard to their Locality

$H_0$14 There is no significant mean difference in i) Cognitive Engagement ii) Emotional Engagement iii) Behavioural Engagement iv) Teaching skills Engagement of Pre-service teachers in regards to locality

Table 4.1.18

**Dimension wise t value of Academic Resilience of Pre-service teacher in regards of locality**

Dimensions	Locality	N	Mean	SD	t value
Cognitive Engagement	Urban	495	38.92	4.69	1.88
	Rural	400	38.31	5.07	
Emotional Engagement	Urban	495	19.59	2.80	2.91
	Rural	400	19.03	2.91	
Behavioural Engagement	Urban	495	26.72	4.14	.915
	Rural	400	26.47	3.99	
Teaching skills Engagement	Urban	495	16.67	2.40	1.51
	Rural	400	16.43	2.48	

*Significance at 0.05% level

For better understanding these mean scores have been presented in the following figure

Fig 4.1.18

Mean score of dimensions wise Classroom Engagement of Pre-service teachers of Assam in regard to locality
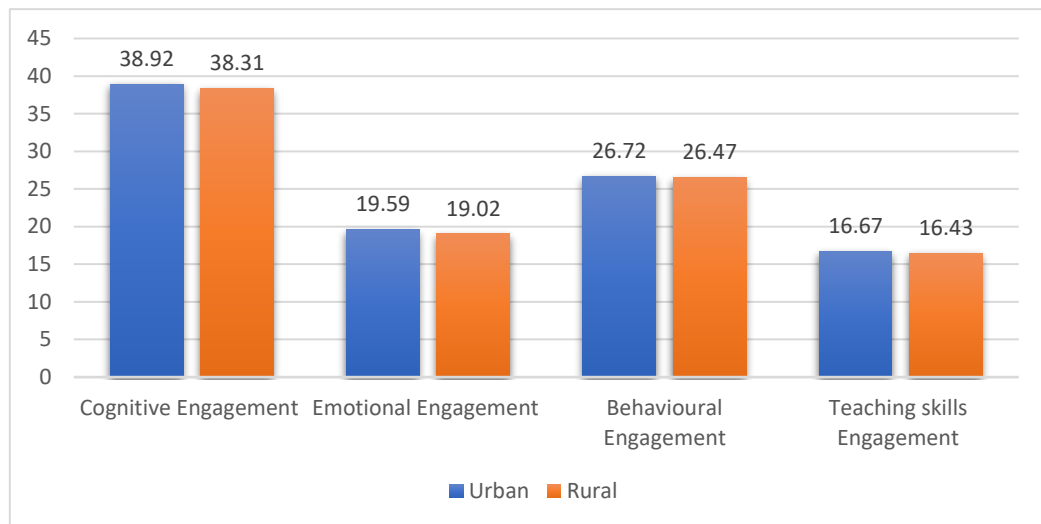
From the above table 4.1.18 and figure 4.1.18, it is observed that in terms of Cognitive Engagement, there exist no significant differences in the mean scores of Urban (M = 38.92, SD = 4.69, N = 495), Rural (M = 38.31, SD = 5.07, N = 400) of Pre-service teachers of Assam. The calculated t value is 1.88 which is more than the table value 1.647 at 0.05 significance level. Hence, the hypothesis "There is no significant mean difference in Cognitive Engagement of Pre-service teachers in regards to locality" is rejected.

it is observed that in terms of Emotional Engagement, there exist significant differences in the mean scores of Urban (M = 19.59, SD = 2.80, N = 495), Rural (M = 19.03, SD = 2.91, N = 400) Pre-service teachers of Assam. The calculated t value is 2.91 which is more than the table value 1.647 at 0.05 significance level. Hence, the hypothesis "There is no significant mean difference Emotional Engagement of Pre-service teachers in regards to locality" is rejected.

It is observed that in terms of Behavioural Engagement, there exist no significant differences in the mean scores of Urban (M =26.72, SD = 4.14, N = 495), Rural (M = 26.47, SD = 3.99, N = 400) Pre-service teachers of Assam. The calculated t value is

.915 which is less than the table value 1.647 at 0.05 significance level. Hence, the hypothesis "There is no significant mean difference in Behavioural Engagement of Pre-service teachers in regards to locality" is accepted.

It is observed that in terms of Teaching skills Engagement, there exist no significant differences in the mean scores of Urban (M = 16.67, SD = 2.40, N = 495), Rural (M = 16.43, SD = 2.48, N = 400) Pre-service teachers of Assam. The calculated t value is 1.51 which is less than the table value 1.647 at 0.05 significance level. Hence, the hypothesis "There is no significant mean difference in Teaching skills Engagement of Pre-service teachers in regards to locality" is accepted.

Objective no 6(iii) To find out dimension wise significant difference in Classroom Engagement of the Pre-service teachers of Assam teachers in regard to their Stream

$H_0$15 There is no significant mean difference in i) Cognitive Engagement ii) Emotional Engagement iii) Behavioural Engagement iv) Teaching skills Engagement of Pre-service teachers in regards to Stream
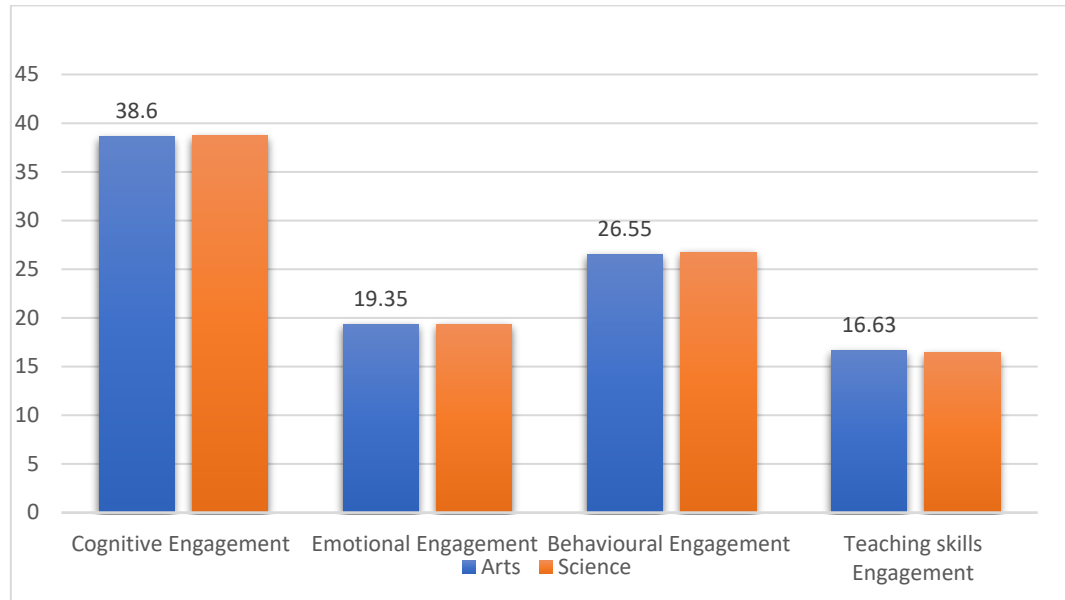
Table 4.1.19

Dimension wise Classroom Engagement of Pre-service teacher in regards to Stream

Dimensions	Stream	N	Mean	SD	t value
Cognitive Engagement	Arts	585	38.60	4.86	-.384
	Science	310	38.73	4.81	
Emotional Engagement	Arts	585	19.31	2.95	.235
	Science	310	18.75	2.71	
Behavioural Engagement	Arts	585	26.55	3.93	.578
	Science	310	26.72	4.34	
Teaching skills Engagement	Arts	585	16.63	2.38	-.259
	Science	310	16.44	2.55	

*Significance at 0.05% level

Fig 4.1.19

Mean score of dimensions wise Classroom Engagement of Pre-service teachers of Assam in regard to Stream

From the above table 4.1.19 and figure 4.1.19, it is observed that in terms of Cognitive Engagement, there exist no significant differences in the mean scores of Arts (M = 38.60, SD = 4.86, N = 585), Science (M = 38.73, SD = 4.81, N = 310) of Pre-service teachers of Assam. The calculated t value is -.384 which is less than the table value 1.647 at 0.05 significance level. Hence, the hypothesis "There is no significant mean difference in Cognitive Engagement of Pre-service teachers in regards to Stream" is accepted.

it is observed that in terms of Emotional Engagement, there exist significant differences in the mean scores of Arts (M = 19.31, SD = 2.95, N = 495), Science (M = 18.75, SD = 2.71, N = 310) Pre-service teachers of Assam. The calculated t value is .235 which is less than the table value 1.647 at 0.05 significance level. Hence, the hypothesis "There is no significant mean difference in Emotional Engagement of Pre-service teachers in regards to Stream" is accepted.

It is observed that in terms of Behavioural Engagement, there exist no significant differences in the mean scores of Arts (M =26.55, SD = 3.93, N = 585), Science (M = 26.72, SD = 4.34, N = 310) Pre-service teachers of Assam. The calculated t value is .578 which is less than the table value 1.647 at 0.05 significance level. Hence, the

hypothesis "There is no significant mean difference Behavioural Engagement of Pre-service teachers in regards to Stream" is accepted.

It is observed that in terms of Teaching skills Engagement, there exist no significant differences in the mean scores of Arts (M = 16.63, SD = 2.38, N = 585), Science (M = 16.44, SD = 2.55, N = 310) Pre-service teachers of Assam. The calculated t value is -.259 which is less than the table value 1.647 at 0.05 significance level. Hence, the hypothesis "There is no significant mean difference in Teaching skills Engagement of Pre-service teachers in regards to Stream" is accepted.

Objective no 6(iv) To find out dimension wise significant difference in Classroom Engagement of the Pre-service teachers of Assam teachers in regard to their Types of institution

H$_0$16 There is no significant mean difference in i) Cognitive Engagement ii) Emotional Engagement iii) Behavioural Engagement iv) Teaching skills Engagement of Pre-service teachers in regards to Types of institution
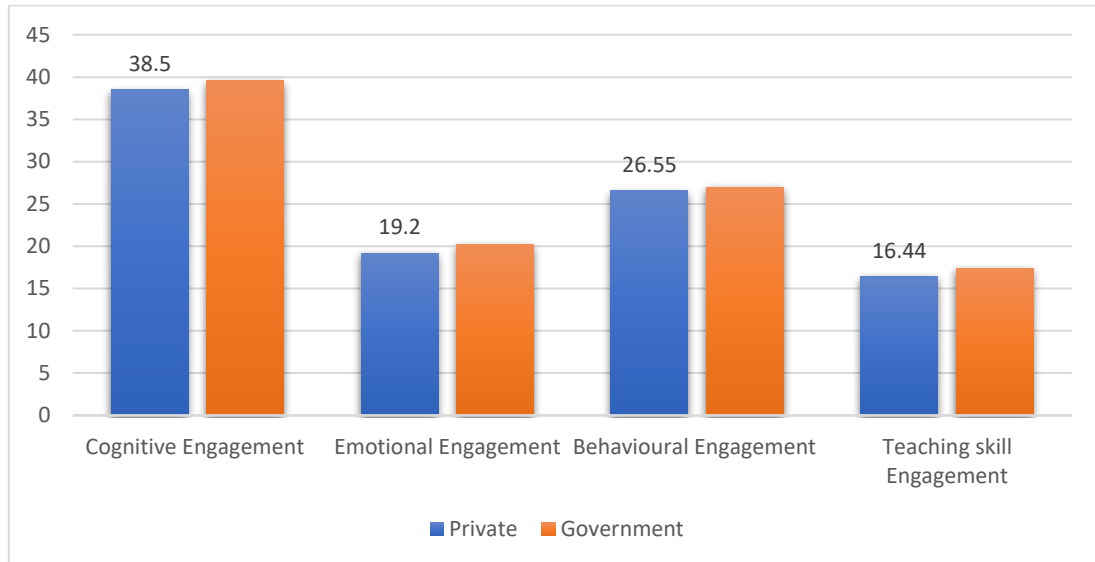
Table 4.1.20

Dimension wise t value of Classroom Engagement of Pre-service teacher in regards to Types of institution

Dimensions	Type of Institution	N	Mean	SD	t value
Cognitive Engagement	Private	779	38.50	4.81	-2.29
	Government	116	39.60	4.93	
Emotional Engagement	Private	779	19.20	2.84	-3.62
	Government	116	20.23	2.87	
Behavioural Engagement	Private	779	26.55	4.08	-1.10
	Government	116	27.00	4.02	
Teaching skills Engagement	Private	787	16.44	2.43	-4.01
	Government	116	*17.41*	*2.30*	

*Significance at 0.05% level

144

Fig 4.1.20

**Mean score of dimensions wise Classroom Engagement of Pre-service teachers
of Assam in regard to Type of institution**

From the above table 4.1.20, it is observed that in terms of Cognitive Engagement, there exist no significant differences in the mean scores of Private (M = 38.50, SD = 4.81, N = 779), Government (M = 39.60, SD = 4.93, N = 116) of Pre-service teachers of Assam. The calculated t value is -2.29 is less than the table value 1.647 at 0.05 significance level. Hence, the hypothesis "There is no significant mean difference in Cognitive Engagement of Pre-service teachers in regards to Types of institution" is accepted.

In terms of Emotional Engagement, there exist no significant differences in the mean scores of Pri service teachers from Private (M = 19.20, SD = 2.84, N = 779), Government (M = 20.23, SD = 2.87, N = 116) institution of Assam. The calculated t value is -3.62 is less than the table value 1.647 at 0.05 significance level. Hence, the hypothesis "There is no significant mean difference in Emotional Engagement of Pre-service teachers in regards to Types of institution" is accepted.

In terms of Behavioural Engagement, there exist no significant differences in the mean scores of Pri service teachers from Private (M =26.55, SD = 4.08, N = 779), Government (M = 27.00, SD = 4.02, N = 116) institution of Assam. The calculated t value is -1.10 is less than the table value 1.647 at 0.05 significance level. Hence, the

hypothesis "There is no significant mean difference in Behavioural Engagement of Pre-service teachers in regards to Types of institution" is accepted.

In terms of Teaching skills Engagement, there exist no significant differences in the mean scores of Pre-service teachers from Private (M = 16.44, SD = 2.43, N = 779), Government (M = 17.41, SD = 2.30, N = 116) institution of Assam. The calculated t value is -4.01 is less than the table value 1.647 at 0.05 significance level. Hence, the hypothesis "There is no significant mean difference in Teaching skills Engagement of Pre-service teachers in regards to Types of institution" is accepted.

4.10 Normality of Data

Descriptive statistics like mean, standard deviation, skewness, and kurtosis were found to test the normality of scores for Academic Achievement

Table 4.1.21 Descriptive statistics Related to Academic Achievement

Variable	N	Mean	SD	Skewness	Kurtosis
Academic Achievement	895	73.89	9.79	-.124	-.576

The collected raw data was tabulated to present the data systematically and orderly. Table 4.1.5 indicates the overall Academic Achievement of Pre-service teachers of Assam. The measure tendency mean is 73.89. The standard deviation of the sample was found to be 9.79. The value of Skewness and Kurtosis, i.e., -.124 and -.576, which lie between -2 and above +2, are regarded acceptable range for skewness or kurtosis. (George&Mallery,2010). According to the result, the distribution is normal. To illustrate the graphical distribution of the data, Fig. 4.1.21 (a) and (b) show the Histogram, Normal Q-Q Plot.

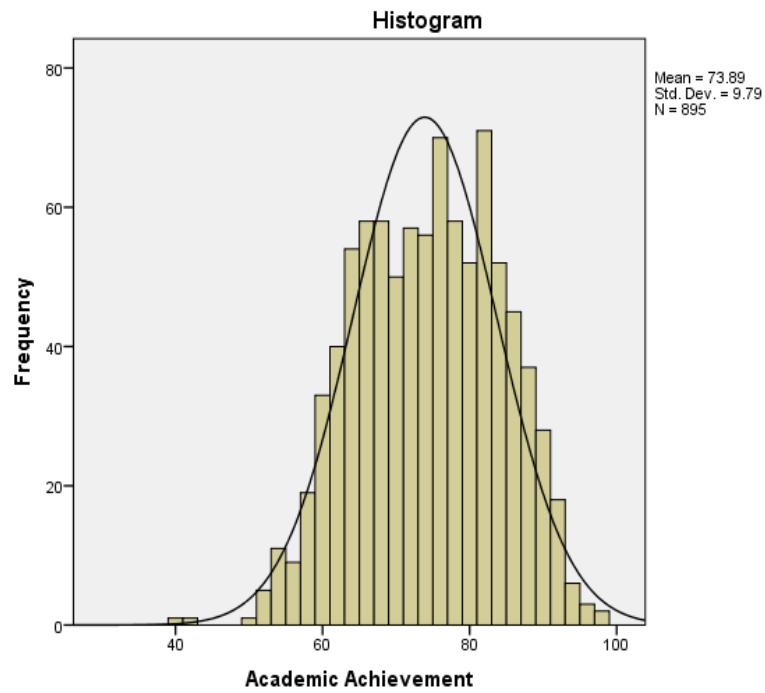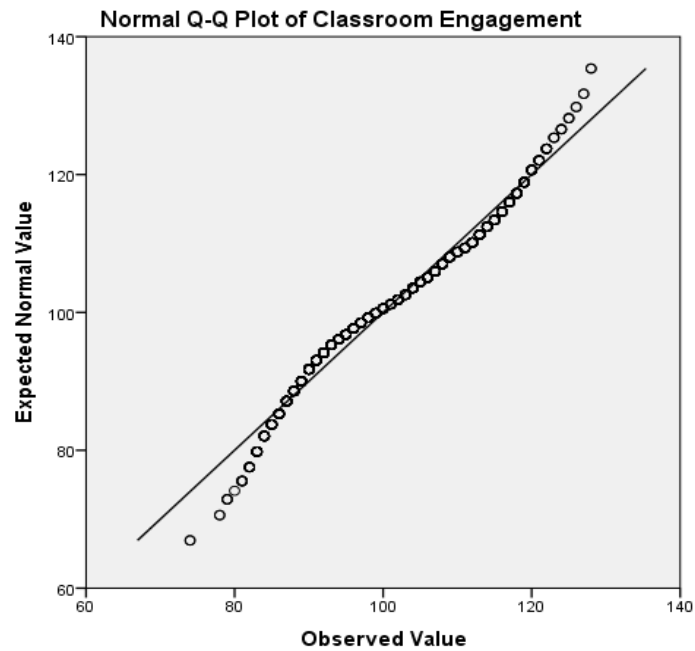**Fig 4.1.21(a) Graphical representation of Academic Achievement**

Fig 4.1.21(b) Graphical representation of Academic Achievement

**4.11 Data analysis and interpretation of Objective 7**

To study the level of Academic Achievement of the Pre-service teachers of Assam

Table 4.1.22

Total number of Pre-service teachers and their percentage lying in each level of Academic Achievement

Sl. No	Levels of Academic Achievement	Frequency	Percentage
1	High	175	19.37
2	Medium	545	60.35
3	Low	175	19.37
		Total 895	100%

Fig 4.1.22 Levels of Academic Achievement
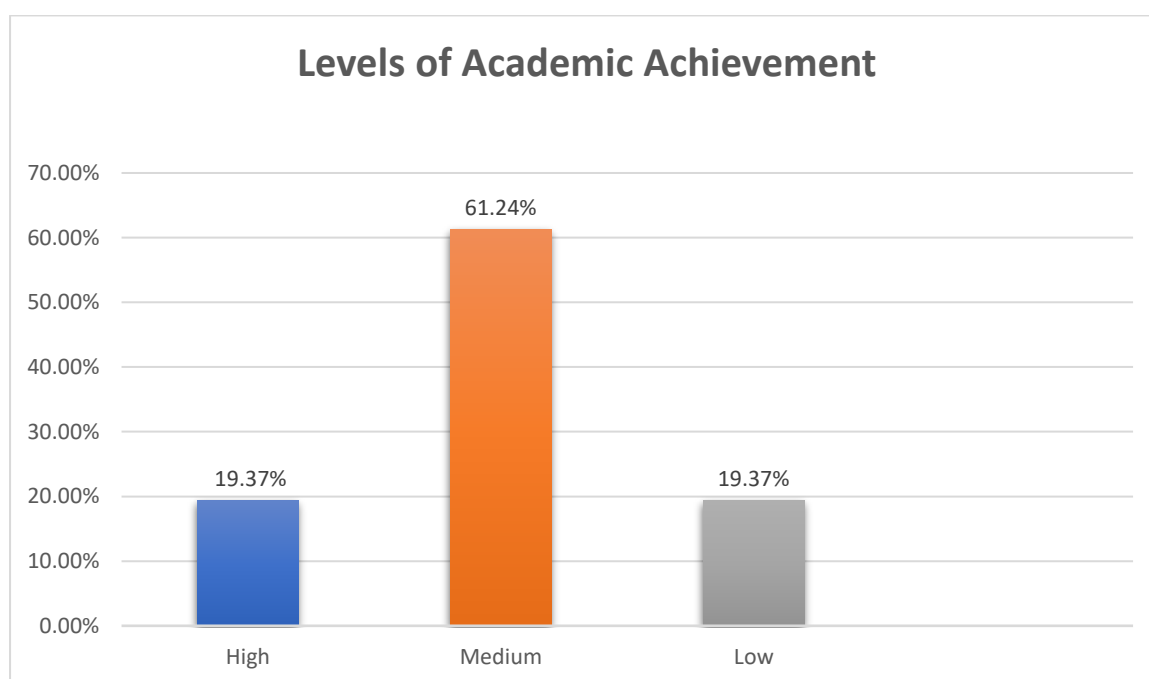
The data presented in table 4.1.22 and figure 4.1.22 shows the distribution of Academic Achievement of Pre-service teachers of Assam. Out of 895 students,545

students exhibit a medium level of Academic Achievement. Further analysis of the data reveals175 Pre- service teachers' students report a high level of Academic Achievement. Again, 175 students' show's lower level of Academic Achievement.

Overall, the findings from this analysis shows 19.37% of Pre-service teachers have high level of Academic Achievement. 60.35% of Pre-service teachers have average level of Academic Achievement. It becomes apparent that the majority of the Pre-service teachers Academic Achievement in this study fall within the average category, indicating medium level of Academic Achievement.

4.12 Data analysis and interpretation of Objective no 8

Objective no 8(i) To find out significant difference in Academic Achievement among the Pre-service teachers of Assam in regard to Gender

H₀17 There is no significant mean difference in Academic Achievement of Pre-service teachers of Assam in regards to Gender

$H_0 17$ There is no significant mean difference in Academic Achievement of Pre-service teachers of Assam in regards to Gender
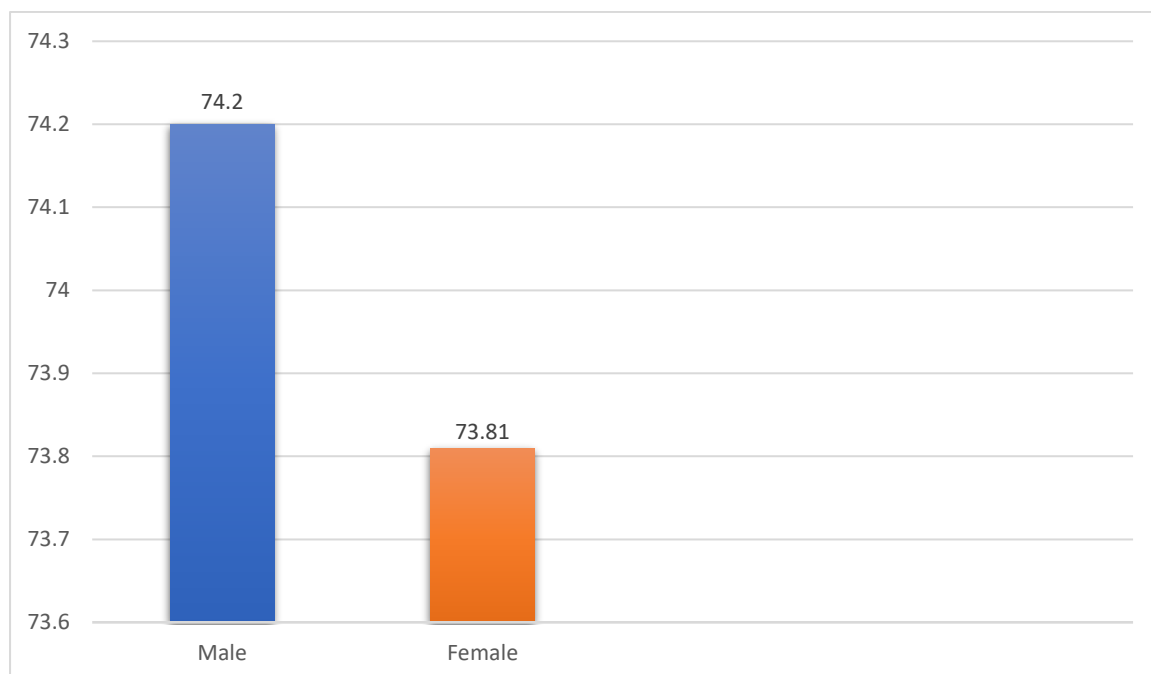
Table 4.1.23

t value of Academic Achievement of Pre-service teachers of Assam in regards to Gender

Gender	N	Mean	SD	Df	t-value	Sig (2-tailed)	Remarks
Male	182	74.20	9.85	893	-.474	.635	Not significant
Female	713	73.81	9.53				

*Significance at 0.05% level

149

Fig 4.1.23

Mean score of Academic Achievement of Pre-service teacher in regards to their Gender

From the table 4.1.23 and figure 4.1.23, it is evident that the mean of male and female Pre- service teachers is 74.20 and 73.81 and their SD 9.85 and 9.53 respectively. The calculated t value (-.474) found out to be less than tabulated t value (1.647) at 0.05 level of significance for two tailed test and Degrees of freedom 893.

Hence, there is no significant mean difference in the Academic Achievement of male and female Pre-service teachers at 0.05 significance level. So, the hypothesis "There is no significant mean difference in Academic Achievement of Pre-service teachers of Assam in regards to Gender" is accepted

Objective no 8(ii) To find out significant difference in Academic Achievement among the Pre-service teachers of Assam in regard to locality

H$_0$18 There is no significant mean difference in Academic Achievement of Pre-service teachers of Assam in regards to locality

To find out the difference in the mean scores in Academic Achievement of Pre-service teachers of Assam with regard to locality, they were divided into two categories (group) based on the locality such as Urban and Rural, to test the hypothesis t test was

performed. At first, the mean score of Pre-service teachers on the variable Academic Achievement with regard to locality was calculated and the result has been presented in the following tables
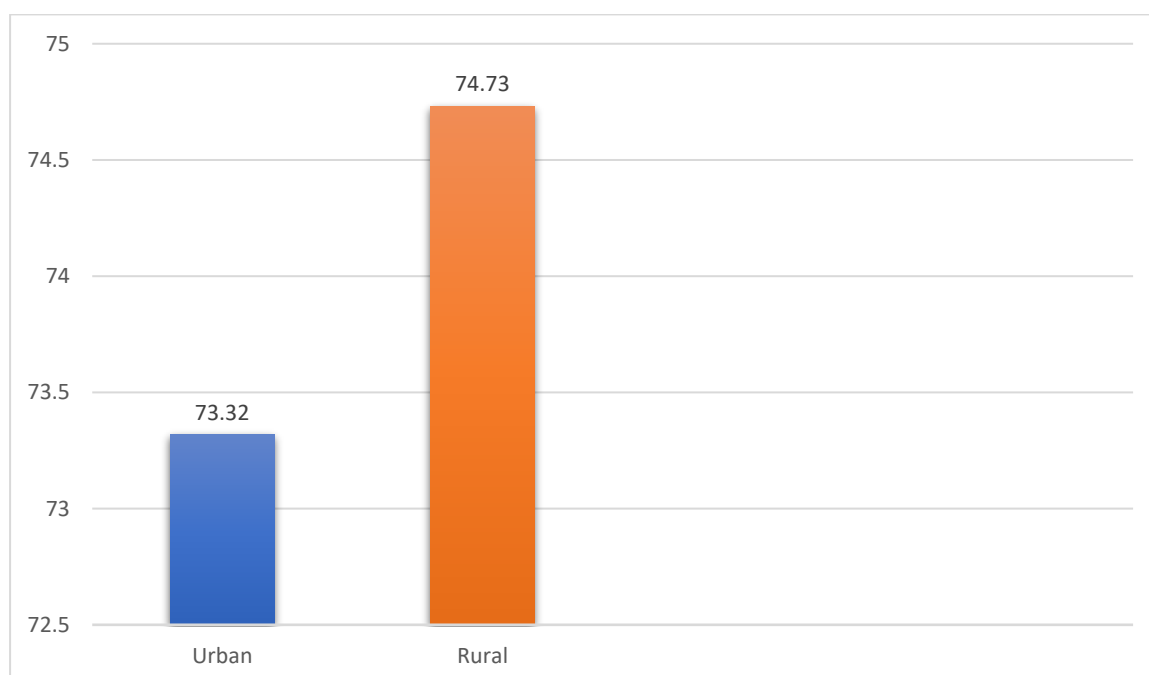
Table 4.1.24

t value of Academic Achievement of Pre-service teachers of Assam in relation to locality

Locality	N	Mean	SD	Df	t-value	Sig (2-tailed)	Remarks
Urban	495	73.32	9.49	893	-2.30	.021	Not significant
Rural	400	74.73	10.09				

*Significance at 0.05% level

Fig 4.1.24

Mean score of Academic Achievement of Pre-service teacher in regards to their locality

From the table 4.1.24 and figure 4.1.24, it is evident that the mean of Urban and Rural Pre-service teachers is 73.32 and 74.73 and their SD is 10.09 and 10.10 respectively. The calculated t value (.021) found out to be less than tabulated t value (1.647) at 0.05 level of significance for two tailed test and Degrees of freedom 893.

Hence, there is no significant mean difference in the Academic Achievement of Pre-service teachers from Urban and Rural area at 0.05 significance level. So, the hypothesis "There is no significant mean difference in Academic Achievement of Pre-service teachers of Assam in regards to locality" is accepted

Objective no 8(iii) To find out significant difference in Academic Achievement among the Pre-service teachers of Assam in regard to Stream

H$_0$20 There is no significant mean difference in Academic Achievement of Pre-service teachers of Assam in regards to Stream

To find out the difference in the mean scores in Academic Achievement of Pre-service teachers of Assam with regard to different stream, they were divided into three categories (group) based on the stream such as Science, Arts, t test is performed.
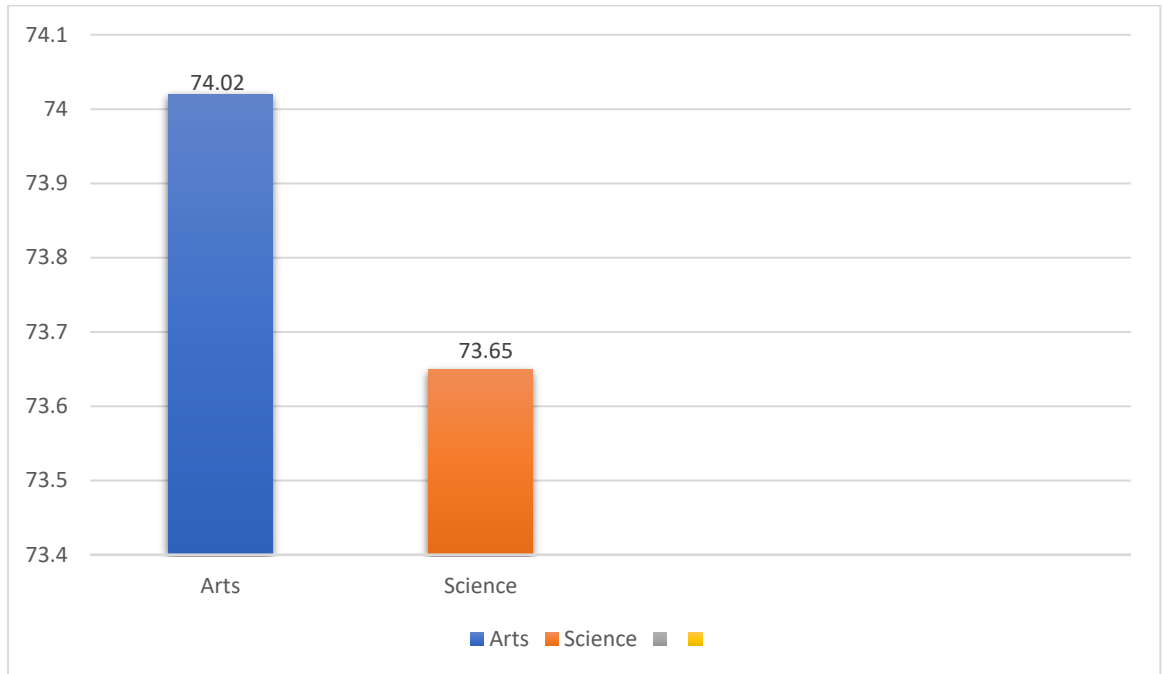
Table 4.1.25

t value of Academic Achievement of Pre-service teachers of Assam in regards to Stream

Types of management	N	Mean	SD	Df	t-value	Sig (2-tailed)	Remarks
Arts	585	74.02	9.77				Not Significant
Science	310	73.65	9.82	893	.524	.600	

*Significance at 0.05% level

152

Fig 4.1.25

Mean score of Academic Achievement of Pre-service teachers in regards to Stream

From the table 4.1.26 and figure 4.1.26, it is evident that the mean score of Pre-service teachers from Arts and Science is 74.02 and 73.65 and their SD is 9.77 and 9.82 respectively. The calculated t value (.524) found out to be less than tabulated t value (1.647) at 0.05 level of significance for two tailed test and Degrees of freedom 893.

Hence, there is no significant mean difference in the Academic Pre-service teachers from Arts and Science stream at 0.05 significance level. So, the hypothesis "There is no significant mean difference in Academic Achievement of Pre-service teachers of Assam in regards to Stream" is accepted

Objective no 8(iv)To find out significant difference in Academic Achievement among the Pre-service teachers of Assam in regard to Types of institution

H$_0$19 There is no significant mean difference in Academic Achievement of Pre-service teachers of Assam in regards to Types of institution

To find out the difference in the mean scores in Academic Achievement of Pre-service teachers of Assam with regard to Type of institution, they were divided into two

categories (group) based on the types of institution such as Private and Government and to test the hypothesis T test was performed.
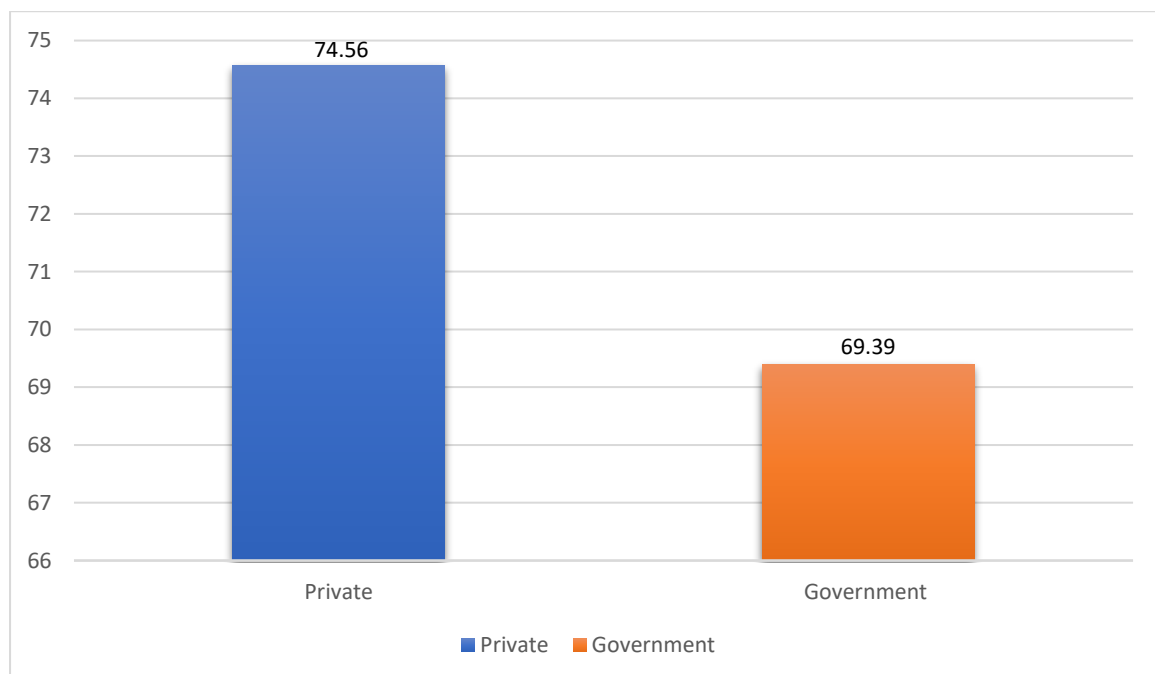
Table 4.1.26

t value of Academic Achievement of Pre-service teachers of Assam in regards to Types of institution

Types of institution	N	Mean	SD	Df	t-value	Sig (2-tailed)	Remarks
Private	779	74.56	9.82	893	5.39	.000	Significant
Government	116	69.39	8.29				

Significance at 0.05% level

Fig 4.1.26

Mean score of Academic Achievement of Pre-service teacher in regards to their Types of institution

From the table 4.1.25 and figure 4.1.25, it is evident that the mean score of Pre-service teachers from Private and Government institution is 74.56 and 69.39 and their SD is 9.82 and 8.29 respectively. The calculated t value (5.39) found out to be more than tabulated t value (1.647) at 0.05 level of significance for two tailed test and Degrees of freedom 893.

Hence, there is significant mean difference in the Academic Achievement of Pre-service teacher s from Private and Government institutions at 0.05 significance level. So, the hypothesis "There is no significant mean difference in Academic Achievement of Pre- service teachers of Assam in regards to Types of institution" is rejected.

4.13 Data analysis and interpretation of Objective no 9

To find out the relationship between Academic Resilience and Academic Achievement among Pre-service teachers of Assam

$H_0 21$ There is no significant relationship between Academic Resilience and Academic Achievement of Pre-service teachers of Assam
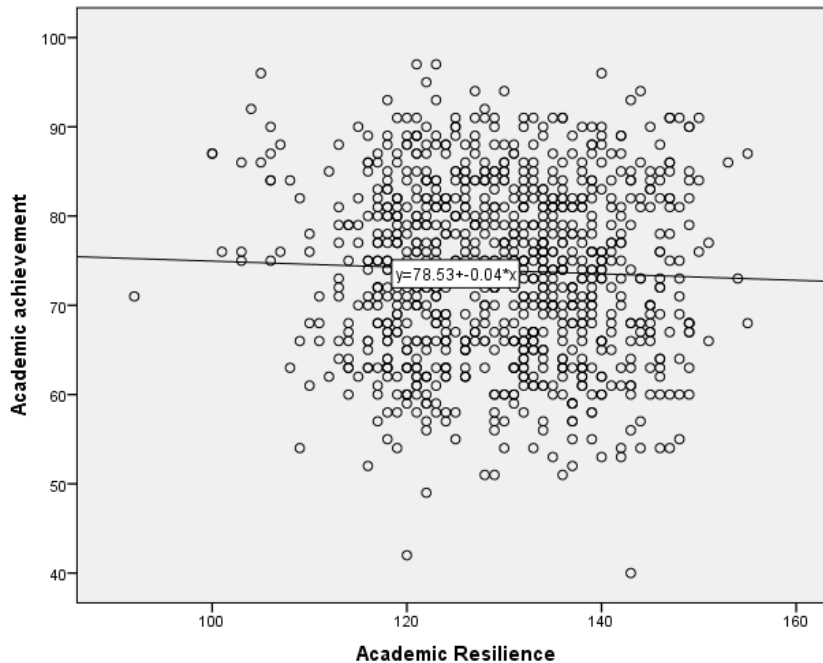
Table 4.1.27

Correlation between Academic Resilience and Academic Achievement of Pre-service teachers of Assam

Pearson correlation				Remarks
Variable	N	r value	P value	
Academic Resilience	895	-.038	.260	Not significant
Academic Achievement				

*Significant at 0.05% level

Fig 4.1.27

Scattered Plot for Correlation between Academic Resilience and Academic Achievement

Pearson's correlation analysis resulted in 'r' value of -.038, where 'p' value > 0.05. The calculated 'r' (-.038) is less than the critical 'r' (0.06) at 0.05 level of significance and degrees of freedom 893.

As the calculated 'r' is less than the table 'r,' it means that there is a no significant correlation between Academic Resilience and Academic Achievement. Thus, the hypothesis stating that "There is no significant positive correlation between Academic Resilience and Academic Achievement of the Pre-service teachers of Assam" is accepted.

4.14 Data analysis and interpretation of objective 10

To find out the relationship between Classroom Engagement and Academic Achievement among Pre-service teachers of Assam

H₀22 There is no significant relationship between Classroom Engagement and Academic Achievement of Pre-service teachers of Assam
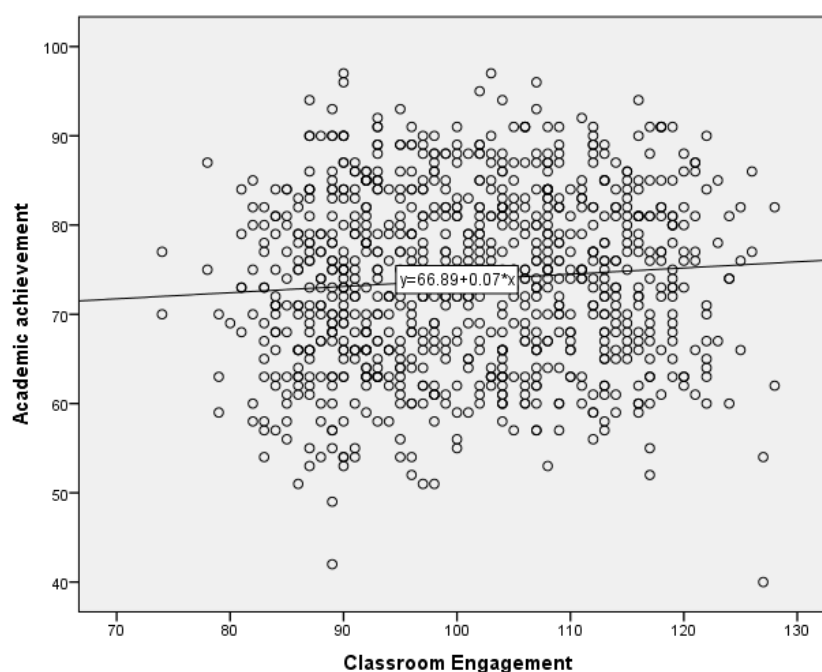
Table 4.1.28

Correlation between Classroom Engagement and Academic Achievement of Pre -
-service teachers of Assam

Pearson correlation				Remarks
Variable	N	r value	P value	
Classroom Engagement	895	.080	.017	.05 significant correlation
Academic Achievement				

Significant at 0.05% level

Fig 4.1.28

Scattered Plot for Correlation between Academic Resilience and Academic Achievement

Pearson's correlation analysis resulted in 'r' value of 0.080, where 'p' value<0.05 (see table 4.31). The calculated 'r' (0.080) is greater than the critical 'r' (0.06) at 0.05 level of significance and degrees of freedom 893.

As the calculated 'r' is greater than the table 'r,' it means that there is a significant correlation between Classroom Engagement and Academic Achievement. The positive 'r' value signifies a positive relationship and the strength of the relationship is moderate. Thus, the hypothesis stating that "There is no significant relationship between Classroom Engagement and Academic Achievement of Pre-service teachers of Assam" is rejected.

4.15 Data analysis and interpretation of objective no 11

To find out influence of Academic Resilience and Classroom Engagement on Academic Achievement of Pre-service teachers of Assam

Before conducting a regression analysis, the following assumptions need to be fulfilled:

(1) **Normality of Data:** The Normality of data have already been tested. The data are found to be normal.

(2) **Multicollinearity:** Multicollinearity has been tested based on the Tolerance and VIF values. Tolerance values less than 0.1 and VIF (Variance inflation factor) values above 10 suggest multicollinearity, which can be problematic (Source). In the study tolerance values above 0.1 and VIF values below 10 indicate the absence of multicollinearity.
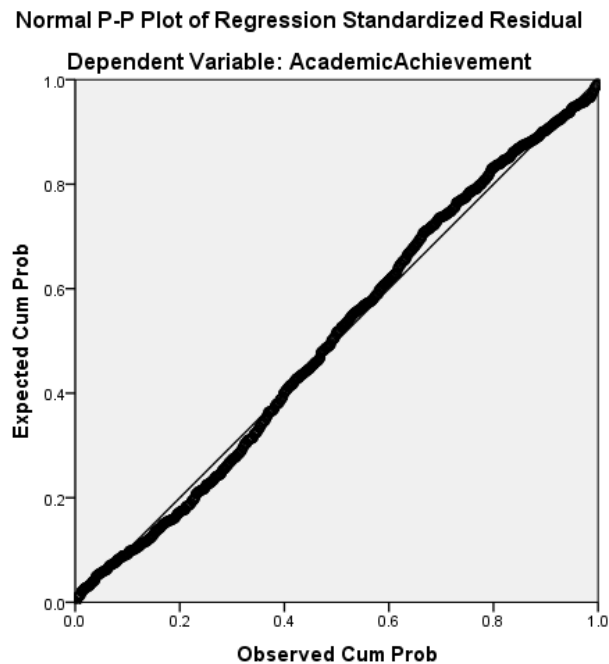
Table 4.1.29 VIF values testing multicollinearity

	Tolerance	VIF
Academic Resilience	1.00	1.00
Classroom Engagement	1.00	1.00

3.Normality of regression residuals

Fig 4.1.29:

Normal P-P Plot of Regression Standardized Residual

Normal P-P Plot of Regression Standardized Residual
Dependent Variable: AcademicAchievement

H₀23 **There is no significant influence of Academic Resilience and Classroom Engagement in Academic Achievement of Pre-service teachers of Assam**

Table 4.1.30

A summary of the R, R Square, and adjusted R square in multiple regression analysis

Model	R	R square	Adjusted R square	Std error of the estimate
1	.089	.008	.006	9.76

a. Predictors: (Constant), Academic Resilience, Classroom Engagement

b. Dependent Variable: Academic Achievement

Table 4.1.31

The Beta coefficient in a multiple Regression Analysis

Model	Unstandardized coefficient		Standardized Coefficient	T	Significant
	B	Std. Error	Beta		
1 (Constant)	71.48	5.018		14.24	.000
Academic Resilience	-.036	.031	-.038	-1.135	.257
Classroom Engagement	.069	.029	.080	2.416	.016

*Significance at 0.05% level

 a. Dependent variable: Total Academic Achievement

Standardized Beta coefficient of -.038 is found for the variable Academic Resilience,.080 for Classroom Engagement.

The regression analysis table 4.1.30 indicates that .8% of influence on Academic Achievement. Hence the Hypothesis $H_0$23 is accepted since Academic Resilience and Classroom Engagement have been found no influence on Academic Achievement of Pre- service teachers of Assam.

4.16 Data analysis and interpretation of objective no 12

To find out different barriers and underlying factors in regard to classroom transaction faced by Pre-service teachers of Assam

The present section of analysis identified four different barriers and underlying factors in regard to classroom transaction faced by the Pre-service teachers. With the help of self-developed questionnaire, the required data has been collected. For analysis purpose the required data has been categorised under the following dimensions –

A. Adoption of Technology
B. Classroom Communication
C. Pedagogical Practices

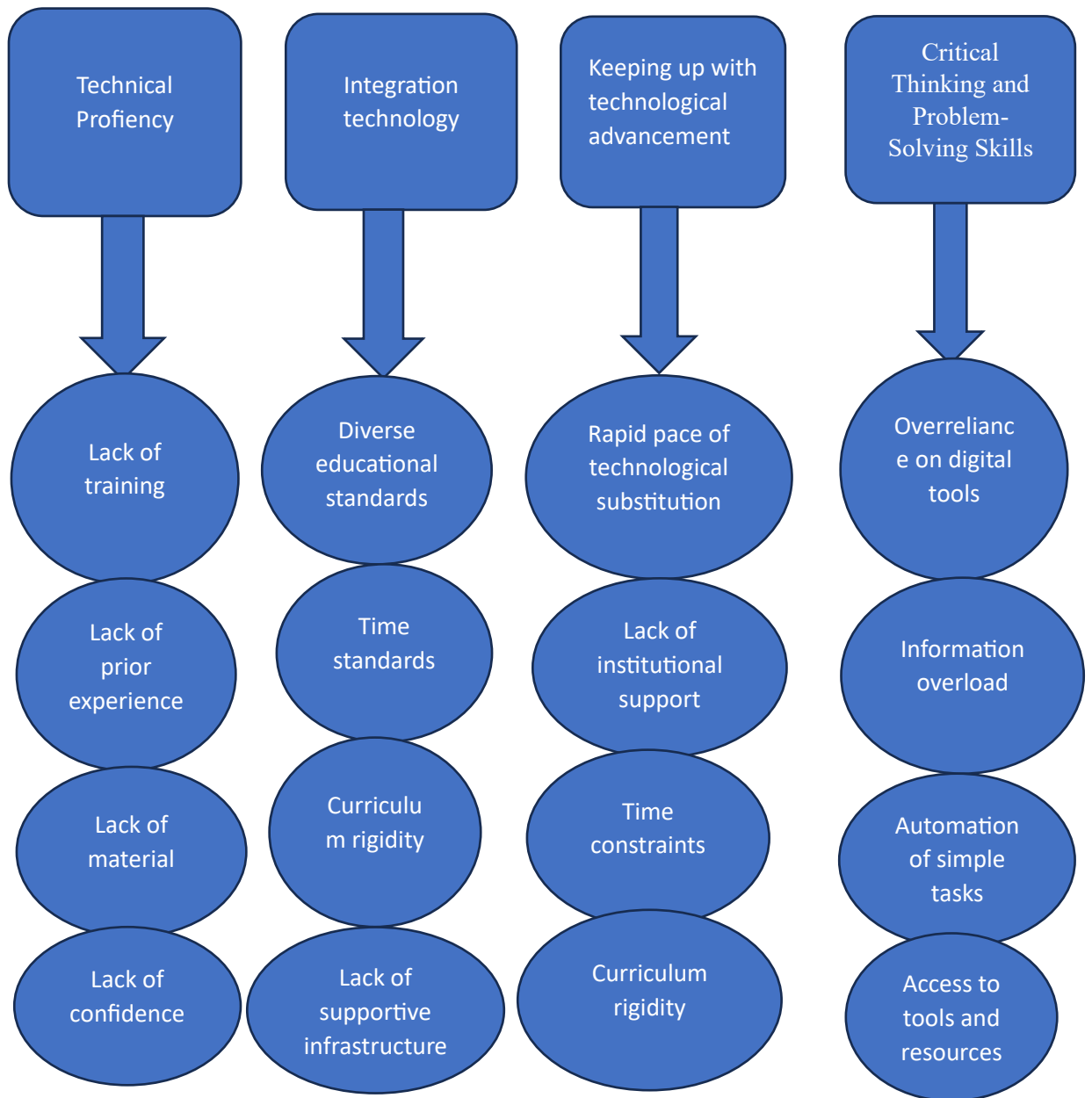D. Curriculum and Subject Matter

A. Adoption of Technology

Technical Profiency	Integration technology	Keeping up with technological advancement	Critical Thinking and Problem-Solving Skills
Lack of training	Diverse educational standards	Rapid pace of technological substitution	Overreliance on digital tools
Lack of prior experience	Time standards	Lack of institutional support	Information overload
Lack of material	Curriculum rigidity	Time constraints	Automation of simple tasks
Lack of confidence	Lack of supportive infrastructure	Curriculum rigidity	Access to tools and resources

Table 4.1.32: Barriers and underlying factors in regard to Adoption of technology

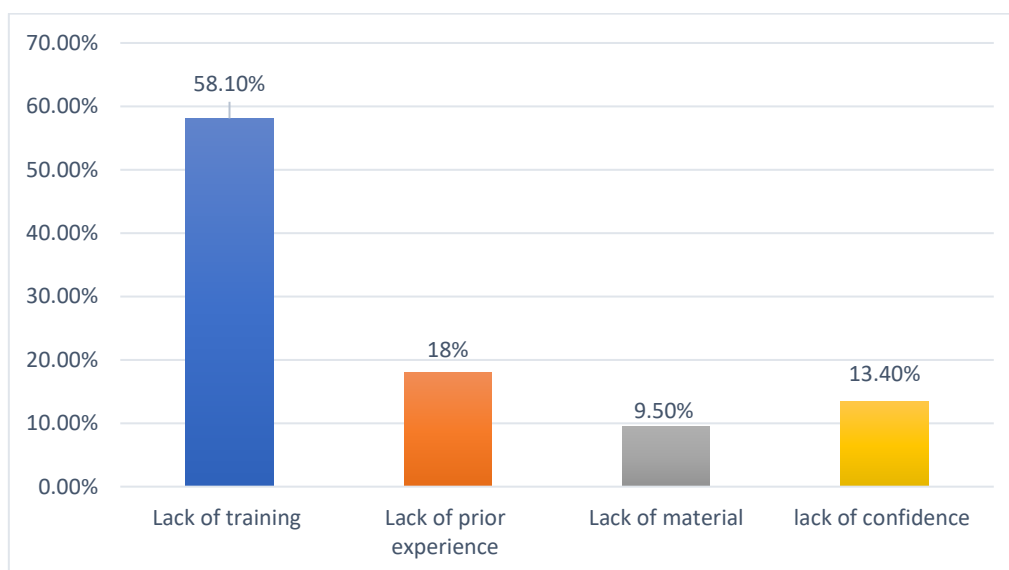| Barriers faced by Pre-service teachers	Factors	Frequency	Percentage
Technical profiency	Lack training	521	58.16 %
	Lack of prior experience	162	18.34%
	Lack of material sources	84	9.39%
	Lack of Confidence	116	12.97%
Integration of technology	Limited exposure during training	412	46%
	Time constraint	242	26.1%
	Curriculum rigidity	134	15%
	Lack of Supportive Infrastructure	116	13%
Keeping Up with Technological Advancement	Rapid Pace of Technological Substitution	298	33.3%
	Lack of Institutional Support	179	20%
	Time constraint	359	40.5%
	Curriculum rigidity	47	5.2%
Critical Thinking and Problem-Solving Skills	Over-Reliance on Digital Tools	495	55.3%
	Information overload	224	25%
	Automation of simple tasks	93	10.4%
	Access to tools and resources	72	8%

Figure 4.1.30: Percentage of factors related to Technical Profiency

The above figure 4.1.29 indicates the barriers faced by Pre-service teachers of Assam in terms of technology profiency. Most of the Pre-service teachers (58%) responded on lack of training as a factor of the problem related to technical profiency. Lack of prior experience (18%) with using advanced educational technology make challenging for them to fully utilize these tools in the classroom, leading to frustration or inefficiency in regard to technical profiency. Lack of material resources (9.5%) create barrier towards technical profiency. When trying to effectively integrate technology into their teaching practices.13.4% Pre-service teachers responded that lack of confidence can significantly hinder one's ability to engage in technology-related activities. So, it has been found that lack of inadequate training creates the issue of technical proficiency is a barrier towards technology-based activities.
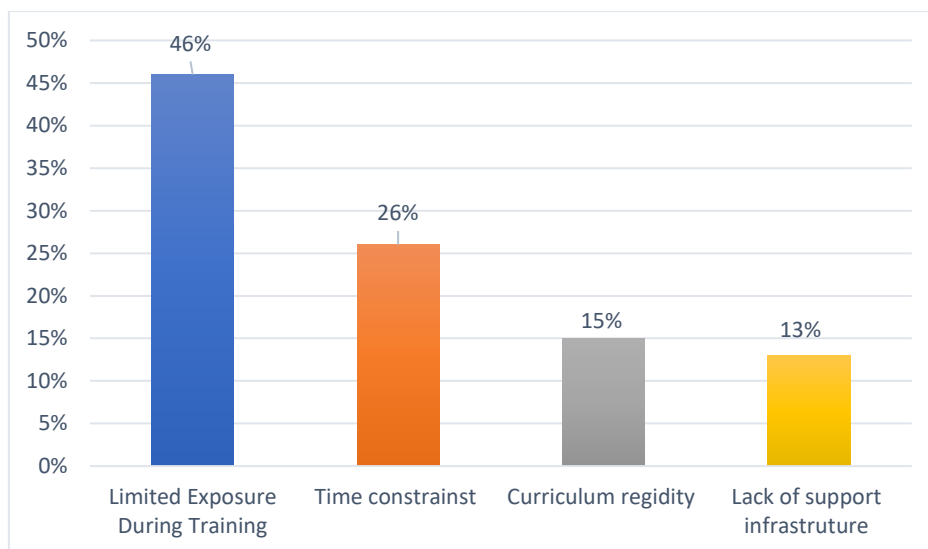
Figure 4.1.31: Percentage of factors related to Integration of technology

The above figure 4.1.30 depicts the views of Pre-service teachers regarding challenges regarding integration of technology. Regarding the point, 46% Pre-service teachers viewed Limited Exposure During Training create hinders. It has been found that 26% Pre-service teachers feel that time constraint is one of challenges towards integration of technology.15% Pre-service teachers think rigidity of curriculum one of the challenges towards incorporate technology. A smaller percentage of Pre-service teachers (13%) do face problems of integration of technology due to lack of support infrastructure. However, it has been found that diverse educational standards in the major challenge regarding integration of technology.
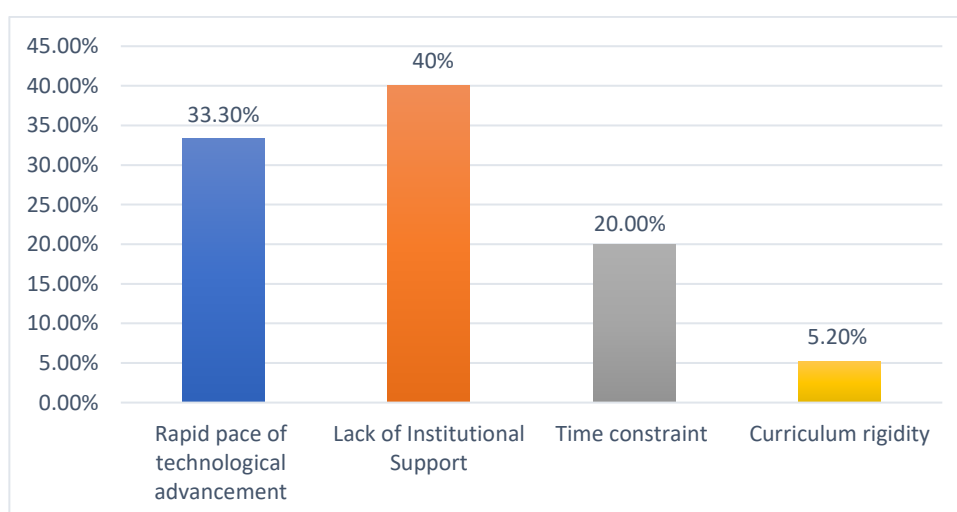

Figure 4.1.32: Percentage of factors related to Keeping up with

Technological advancement

From the figure 4.1.31 it has been found that, most of the Pre-service teachers (33.3%) viewed due to time constraints they face the problem of keeping up with Technological advancement. A maximum portion (40.5%) responded that due to lack of support infrastructure it is problematic in keeping up with technological advancement. Pré service teachers (20%) responded that due to time constraint it is problematic in keeping up with technological advancement. Minor portion of Pre-service teacher (5.2%) viewed that due to rigidity of curriculum they faced issue on keeping up with technological advancement So, it has been found that due to time factor Pre-service teacher faced barriers of keeping up with technological advancement
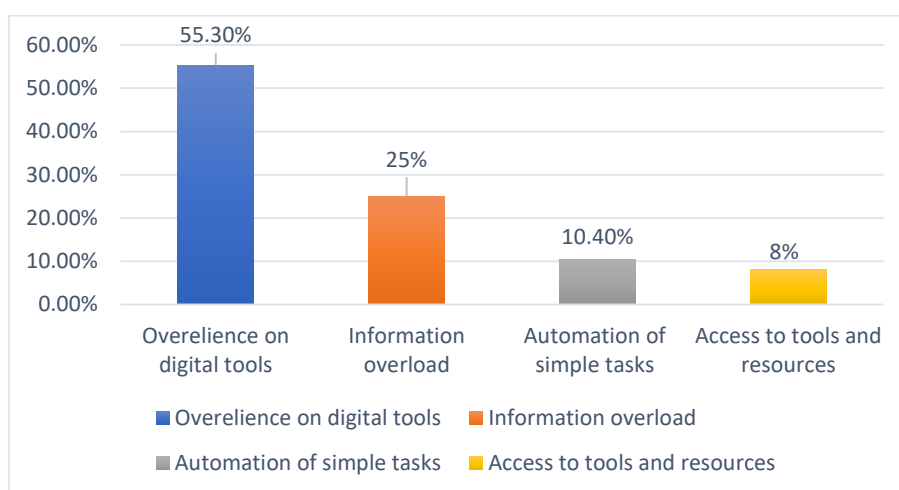

Figure 4.1.33: Percentage of factors related Critical thinking and Problem-solving skills

The above figure 4.1.32 shows that ,55.3% Pre-service teachers viewed over reliance to digital tools crate problem on developing critical thinking and problem-solving skills.25% Pre-service teachers used to say overload information is one of the major factors decreased the ability of critical thinking and problem-solving skill.10.4% Pre-service teachers responded automation of simple tasks leads to the problems of developing critical thinking and problem-solving skills. A minimum number of Pre-service teachers (8%) viewed that Access to tools and resources may hinder in the development of critical thinking and problem-solving skills among the Pre-service teachers. From the data it has been found that Over-reliance on digital tools can indeed pose challenges to the development of critical thinking and problem-solving skills.
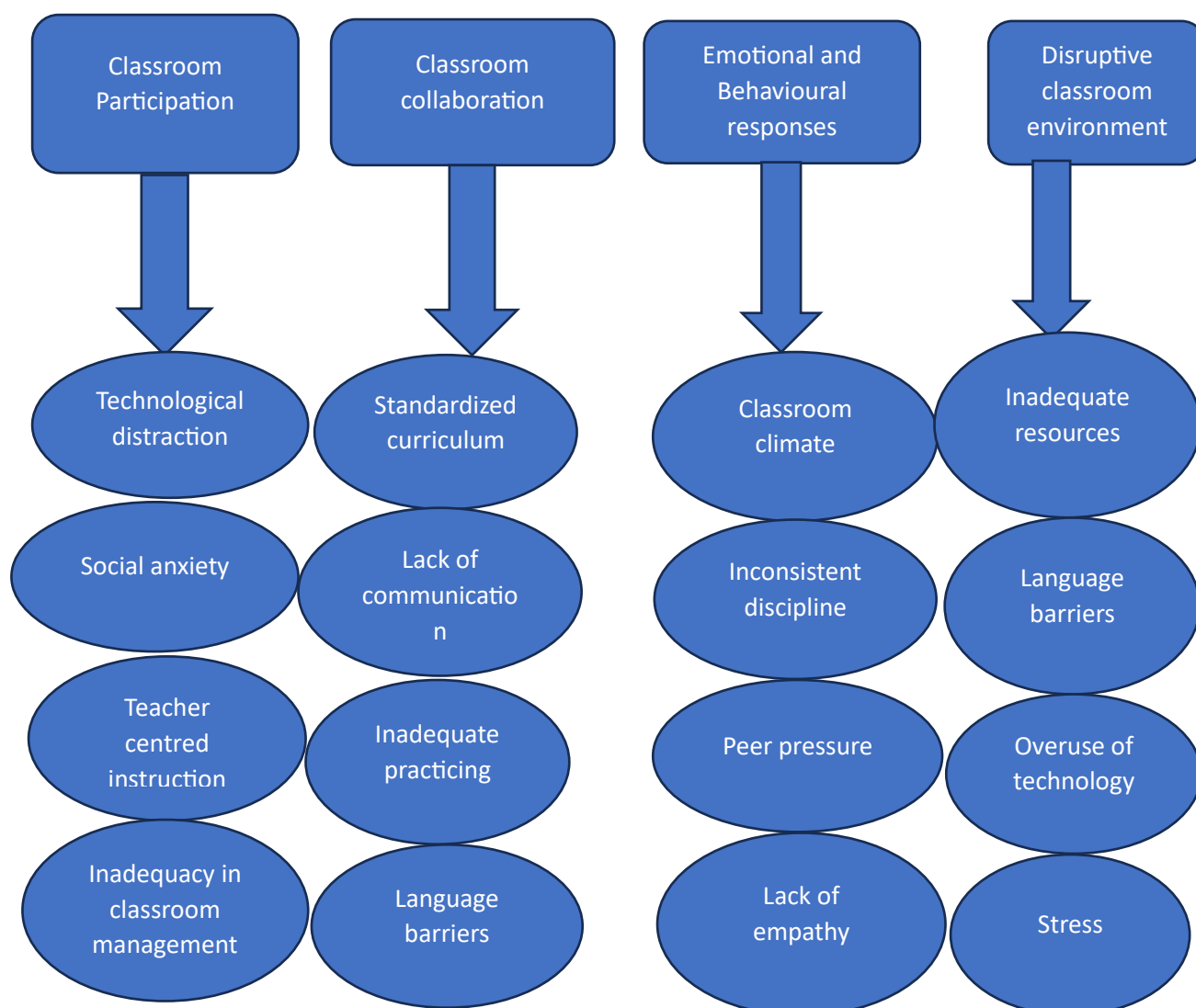
B. CLASSROOM COMMUNICATION

Classroom Participation	Classroom collaboration	Emotional and Behavioural responses	Disruptive classroom environment
Technological distraction	Standardized curriculum	Classroom climate	Inadequate resources
Social anxiety	Lack of communication	Inconsistent discipline	Language barriers
Teacher centred instruction	Inadequate practicing	Peer pressure	Overuse of technology
Inadequacy in classroom management	Language barriers	Lack of empathy	Stress

Table 4.1.33: Barriers and underlying factors in regard to Classroom Communication

Barriers faced by Pre-service teacher	Factors	Frequency	Percentage
Classroom participation	Technological distraction	313	35%
	Social anxiety	246	27.4%
	Teacher centred instruction	144	16.1%
	Inadequacy in Classroom Management	193	21.5%

| Classroom collaboration	Standardized curriculum	251	28%
	Lack of communication	343	38.3%
	Inadequate practicing	125	14%
	Language barriers	186	20.7%
Emotional and behavioral response	Classroom climate	618	69%
	Inconsistent discipline	121	13.5%
	Peer pressure	63	7%
	Lack of empathy	98	11%
Disruptive classroom environment	Inadequate Resources	313	35%
	Language barriers	149	16.6%
	Over use of technology	271	30.4%
	Stress	152	17%
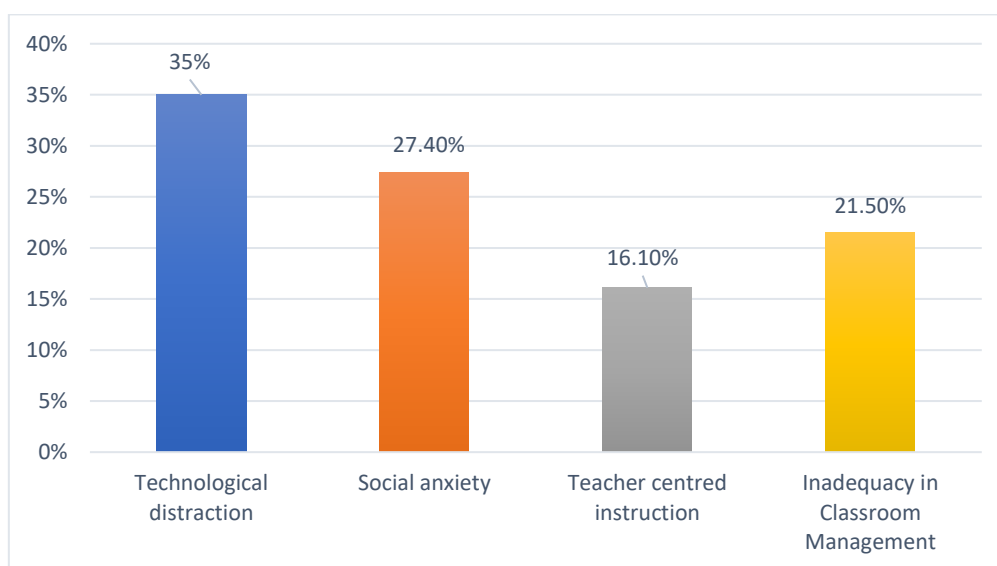
Figure4.1.34: Percentage of factors related Classroom Participation

From the above figure, it has been found that 35% Pre-service teachers viewed technological distraction creates problems in classroom participation. It has been depict that significant portions of respondents,27.4% show concern to the social anxiety in terms of classroom participation.21.5% Pre-service teachers viewed inadequate classroom management leads to towards lack of classroom participation. A minimum portion of respondents (16.1%) states about teacher centred pedagogy in

terms of the above said issue. Thus, Pre-service teachers state technological distraction in the major issue that create hinders classroom participation.
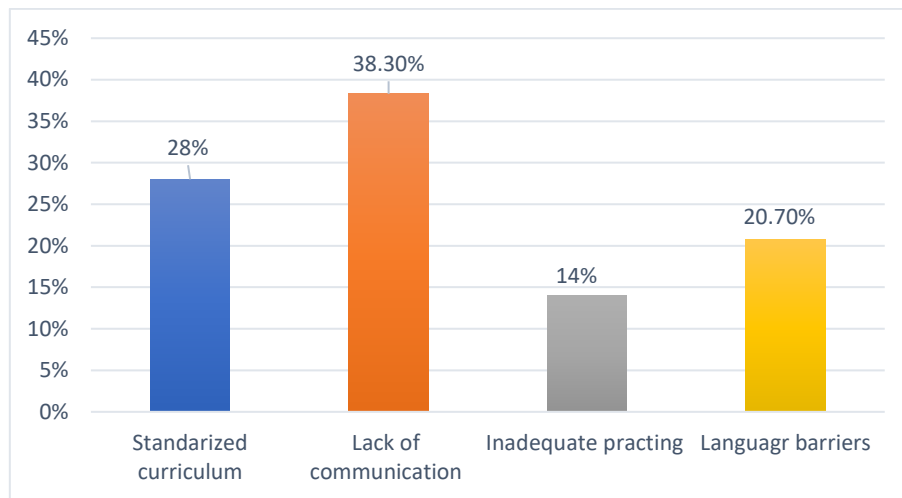

Figure4.1.35: Percentage of factors related to Classroom collaboration

The above figure shows the challenges faced by Pre-service teachers regarding classroom collaboration. The findings indicates that majority of respondents (38.3) face the problem of because of lack of communication.28% respondents feel standardized curriculum create the issue in classroom collaboration. 20.7% Pre-service teachers believe that language barriers in one of the factors affecting classroom collaboration. A minor portion of 14% respondents remain viewed inadequate practicing leads to the issue.
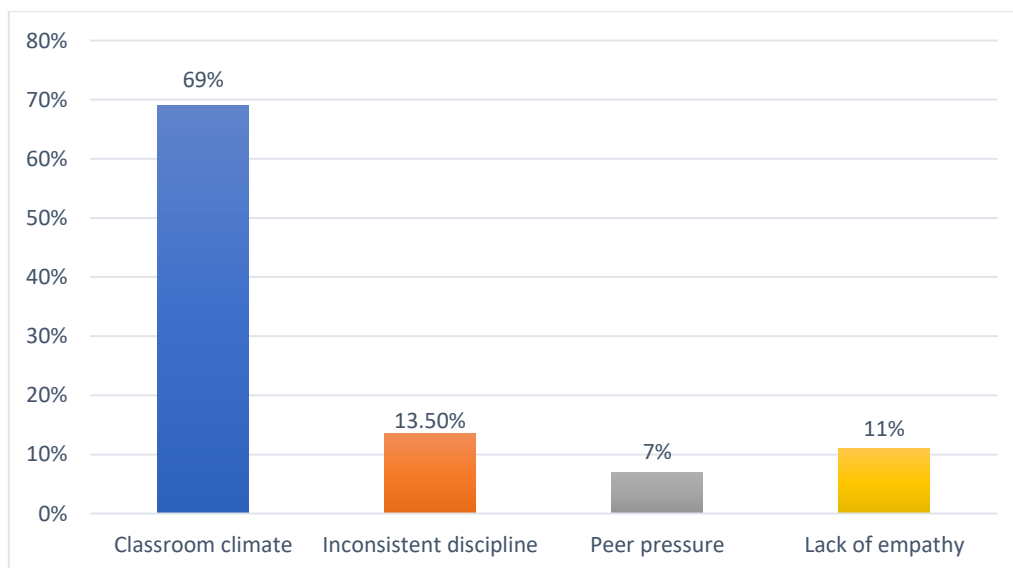

Figure 4.1.36: Percentage of factors related to Emotional and behavioural responses

From the above figure, it has been depicted that a major portion of (69%) Pre-service teachers face the issue of Emotional and behavioural responses due to classroom climate.13.5% Pre-service teachers states about the issue of inconsistent discipline.11% Pre-service teachers face the issue of lack of empathy as one factor of Emotional and behavioural responses. A minor portion of Pre-service teachers (7%) viewed about peer pressure leads to the issue.
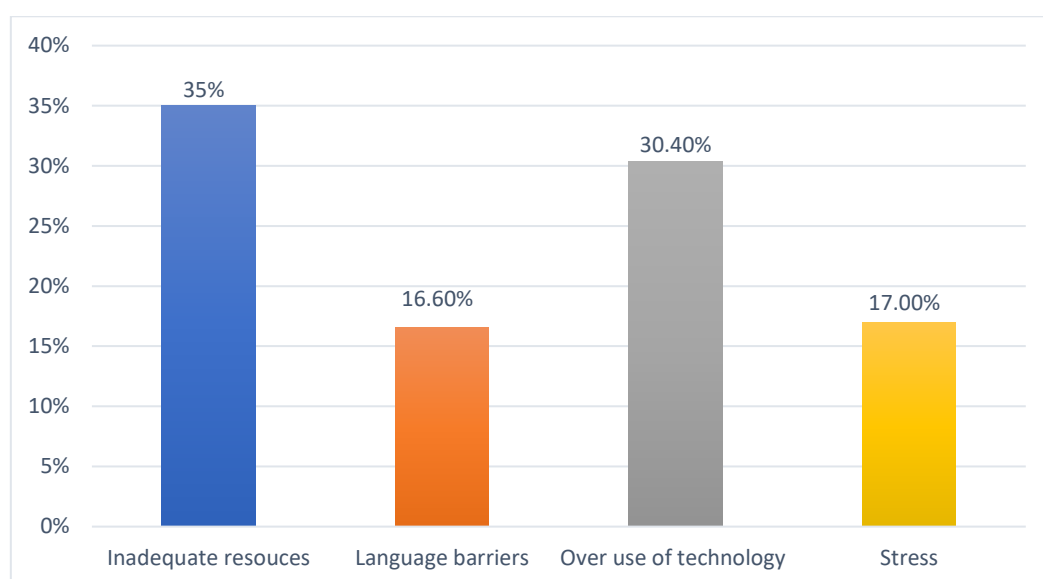

Figure 4.1.37: Percentage of factors related to Disruptive Classroom Environment

From the figure it has been found that 35% Pre-service teacher faced the issue of disruptive classroom environment due to inadequate resource.30.4% Pre-service teachers faced the issue of disruptive classroom environment because of over use of technology.17% Pre- service teachers believe that stress create disruptive classroom environment. Minor portion respondent (16.4%) viewed about the language barriers is one of the factors of disruptive classroom environment.
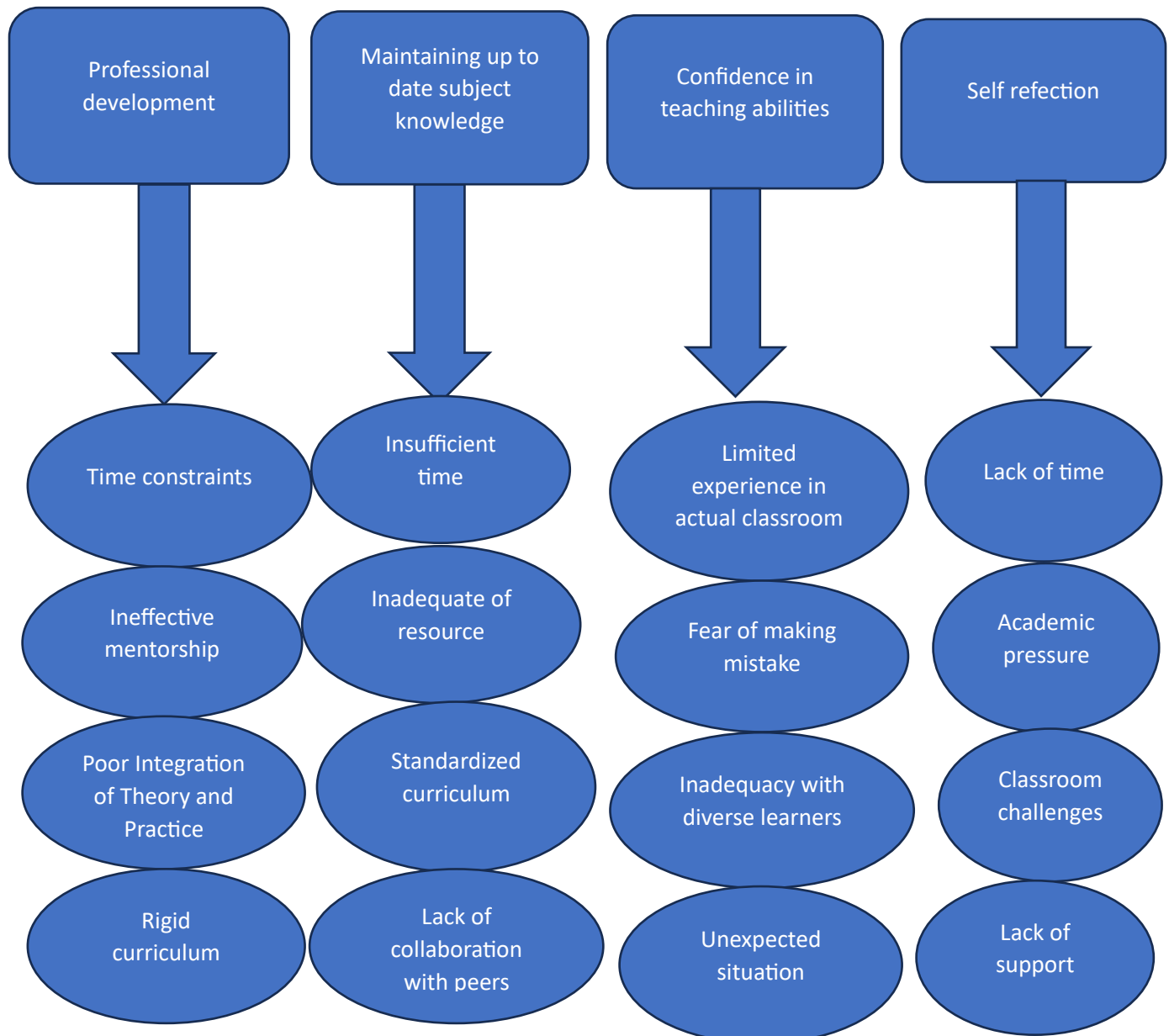
C. Pedagogical practices

Professional development	Maintaining up to date subject knowledge	Confidence in teaching abilities	Self refection
Time constraints	Insufficient time	Limited experience in actual classroom	Lack of time
Ineffective mentorship	Inadequate of resource	Fear of making mistake	Academic pressure
Poor Integration of Theory and Practice	Standardized curriculum	Inadequacy with diverse learners	Classroom challenges
Rigid curriculum	Lack of collaboration with peers	Unexpected situation	Lack of support

Table 4.1.34: Barriers and underlying factors in regard to Pedagogical Practices

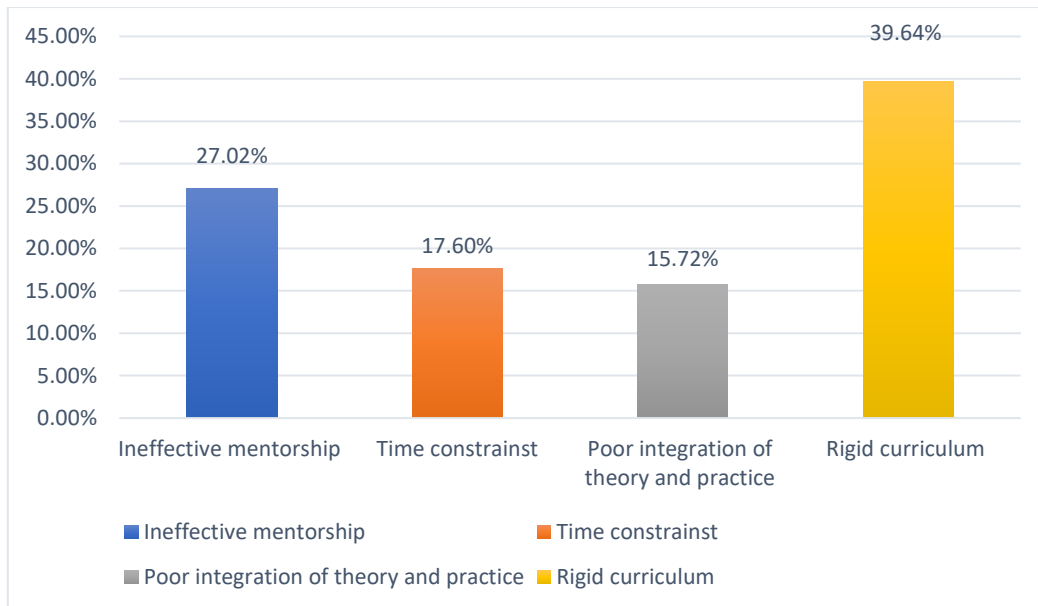| Barriers faced by Pre-service teacher	Factors	Frequency	Percentage
Professional Development	Ineffective mentorship	242	27.02
	Time constraints	158	17.60
	Poor integration of theory and practice	141	15.72
	Rigid curriculum	356	39.64
Maintaining up to date subject knowledge	Insufficient time	361	40.42
	Inadequate of resource	284	31.78
	Standardized curriculum	133	14.83
	Lack of Collaboration with Peers	116	12.92
Confidence in the teaching abilities	Limited experience in actual classroom settings	294	32.77
	Fear of making mistakes	276	30.78
	Inadequacy with Diverse Learners	189	21.04
	Unexpected situations	138	15.39
Self-reflection	Academic Pressure	296	32.77
	Lack of time	249	27.79
	Classroom Challenges	157	17.60
	Lack of Support	226	25.24

Figure 4.1.38: Percentage of factors related to Professional development

In terms of barriers of insufficient Professional development, 39.64% Pre-service teachers responded rigid curriculum as one factors related to the problem of Professional development. Due to ineffective mentorship 27.02% Pre-service teachers views that they faced problem in Professional development. 15.72% Pre-service teachers responded towards Poor integration of theory and practice professional development become insufficient. It has been found that due to time constraints 17.60% create issue in terms of Professional development of the Pre-service teacher.
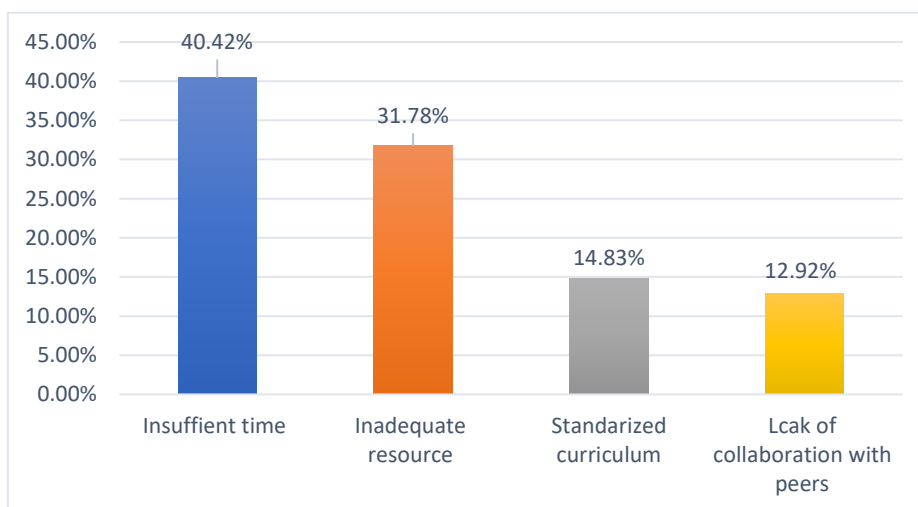

Figure 4.1.39: Percentage of factors related to maintaining up to date subject knowledge

The above table and figure express the views of Pre-service teachers on problems related to maintaining up to date subject knowledge. It has been found that most of the Pre-service teacher (40.42%) not get sufficient time for their self-development. Approximately 31.78% Pre-service teachers responded about the inadequate resources creates problem in the context of maintain up to date subject knowledge. Pressure of standardized testing (14.83%) creates hinders on the issue. Additionally, 12.92% feel the problem of lack of collaboration with peers one the minor challenges regarding up-to-date subject knowledge.
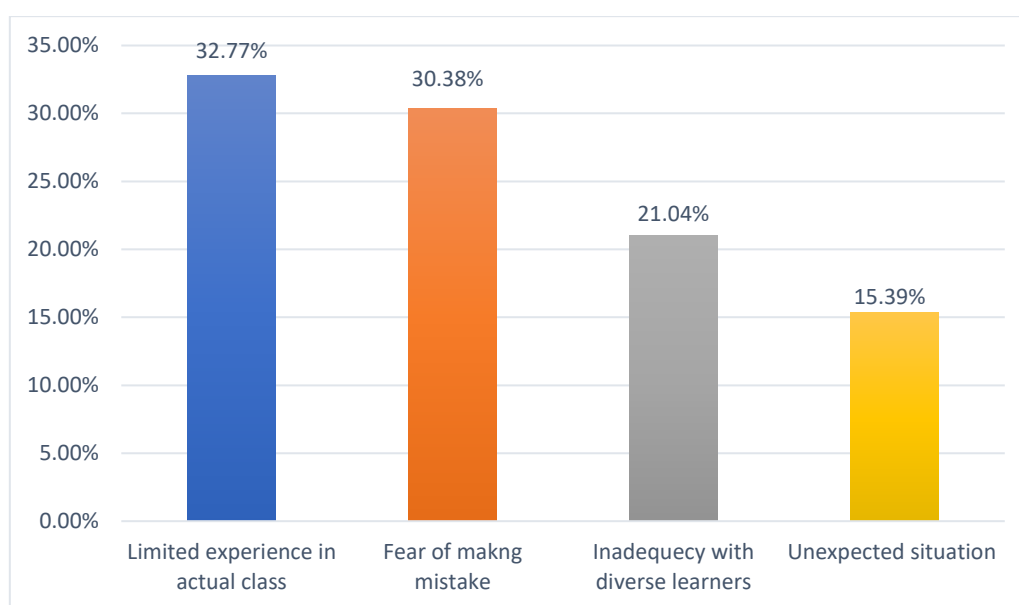

Figure 4.1.40: Percentage of factors related to lack of confidence in the Teaching abilities

In terms of challenges related to lack of confidence in the teaching abilities, majority of Pre-service teachers (32.77%) show their concern about limited experience in the actual classroom setting. The result indicates that 30.38% express their fear of making mistakes that hinders their confidence.21.04% responded inadequacy with diverse learners is one point that hinder in the confidence of the Pre-service teacher in the teaching abilities.15.39 views that lack of experience in handling the unexpected situation leads to decrease the confidence of the Pre-service teacher regarding teaching abilities.
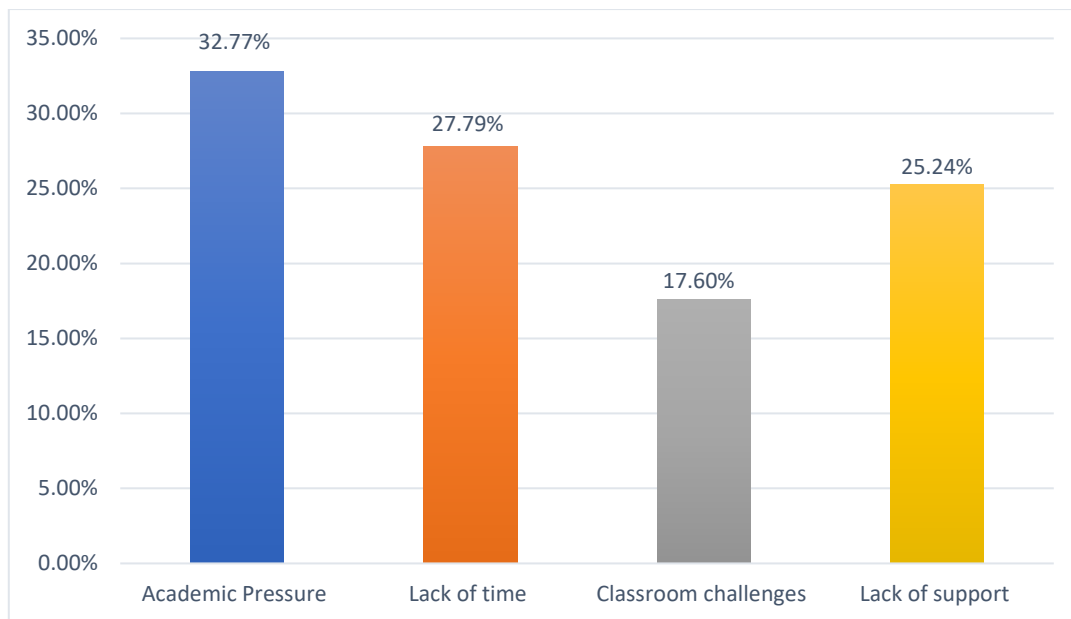
Figure 4.1.41: Percentage of factors related to Self-reflection

The above table helps to depict the challenges to find time for self-reflection. Majority of Pre-service teachers (32.77%) viewed that Academic pressure is one of major issue that they face in this regard. 27.79% Pre-service teacher responded that insufficient time create hinder in terms of self-reflection. Additionally, 25.24% Pre-service teachers face the problem of lack of structured support hinders to find time for self-reflection. A minor portion of Pre-service teachers (17.60%) viewed regarding classroom challenges in terms to find time for self-reflection.
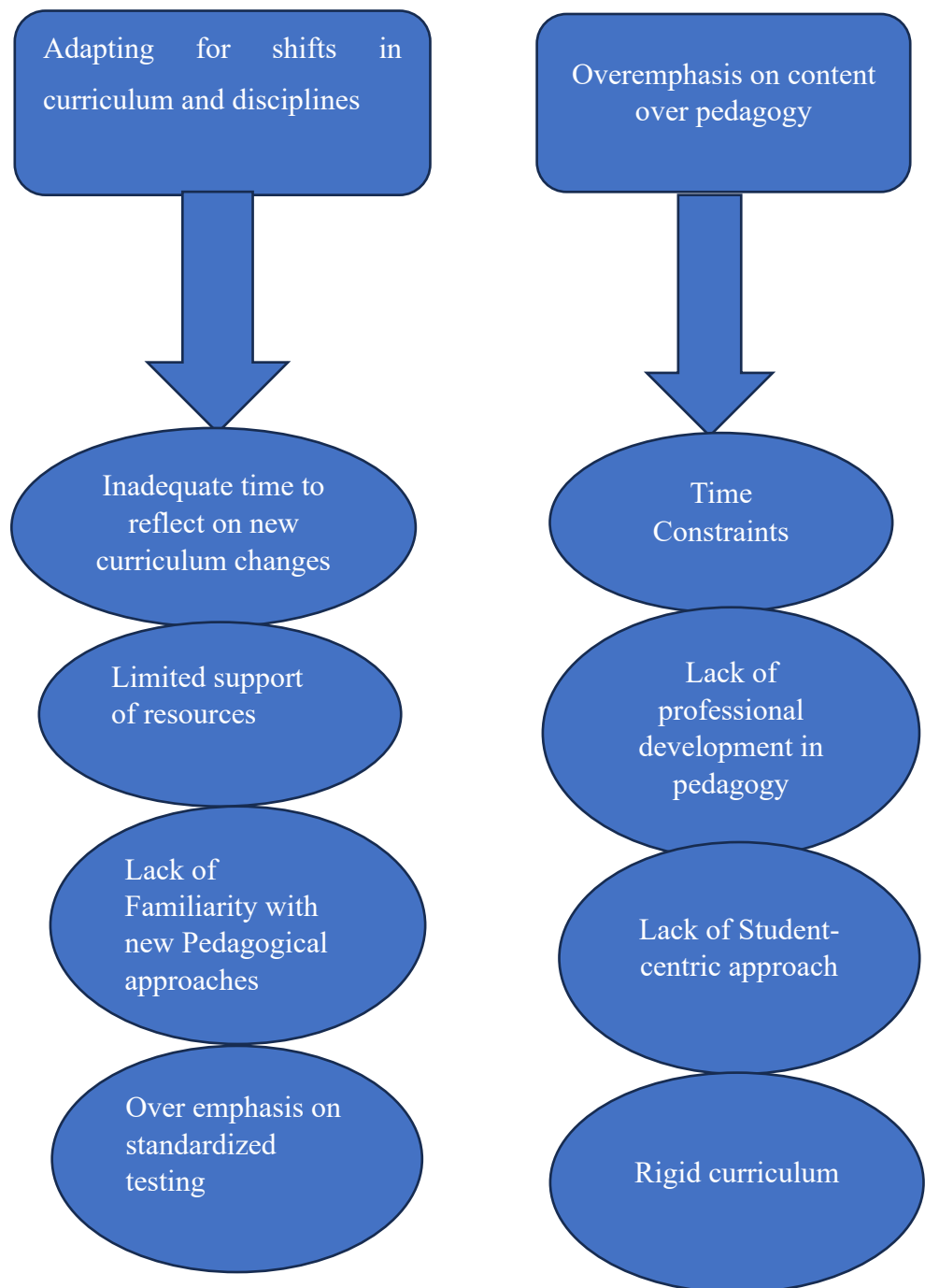
D. Curriculum and Subject Matter

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┌─────────────────────────────┐          ┌─────────────────────────────┐
│ Adapting    for   shifts  in│          │  Overemphasis on content    │
│ curriculum and disciplines  │          │      over pedagogy          │
└─────────────────────────────┘          └─────────────────────────────┘
              │                                        │
              ▼                                        ▼
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Inadequate time to reflect on new curriculum changes

Time Constraints

Limited support of resources

Lack of professional development in pedagogy

Lack of Familiarity with new Pedagogical approaches

Lack of Student-centric approach

Over emphasis on standardized testing

Rigid curriculum

Table 4.1.35: Barriers and underlying factors in regard to Curriculum and Subject Matter

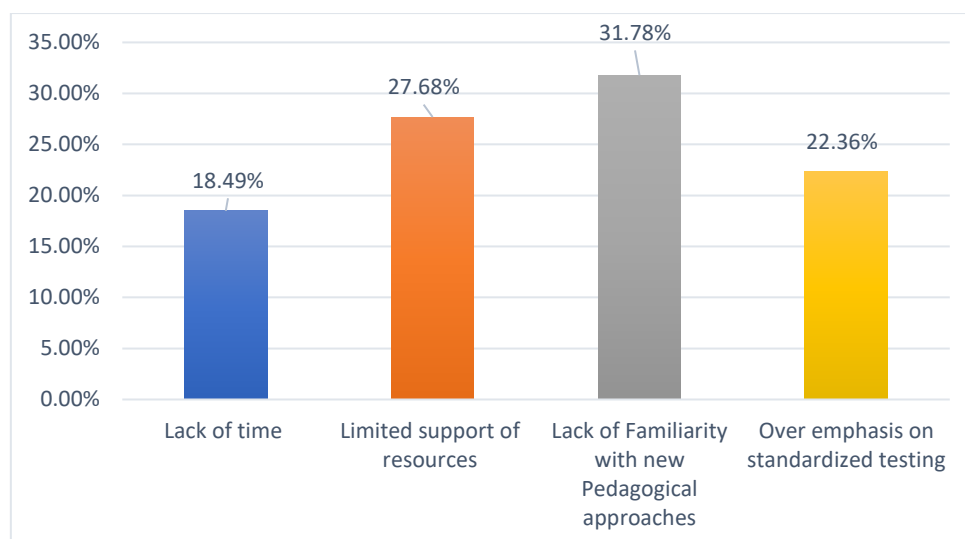| Barriers faced by Pre-service teacher	Factor	Frequency	Percentage
Adapting for shifts in curriculum and disciplines	Inadequate time to reflect on new curriculum changes	166	18.49
	Limited support of resources	247.52	27.68
	Lack of Familiarity with new Pedagogical approaches	284.42	31.78
	Over emphasis on standardized testing	198	22
Overemphasis on content over pedagogy	Time Constraints	153	17.05
	Lack of Professional Development in Pedagogy	212	23.58
	Lac of Student-Centric approach	343	38.31
	Rigid curriculum	189	21.04

Figure 4.1.42: Percentage of factors related to adapting for shifts in Curriculum and Discipline

The above table and figure depict the challenges faced by Pre-service teacher in terms of curriculum and subject matter. It indicates that regarding challenge of adapting for shifts in curriculum and discipline, most of the Pre-service teachers (31.78%) viewed about lack of familiarity with new pedagogical approach.27.68% responded that limited support of resources in one of the points which leads to challenge on adapting for shifts in curriculum and discipline. 22.36% viewed about over emphasize on standardized testing leads to major issue.18.49% Pre-service teachers show their concern on lack of time to reflect new curriculum change.
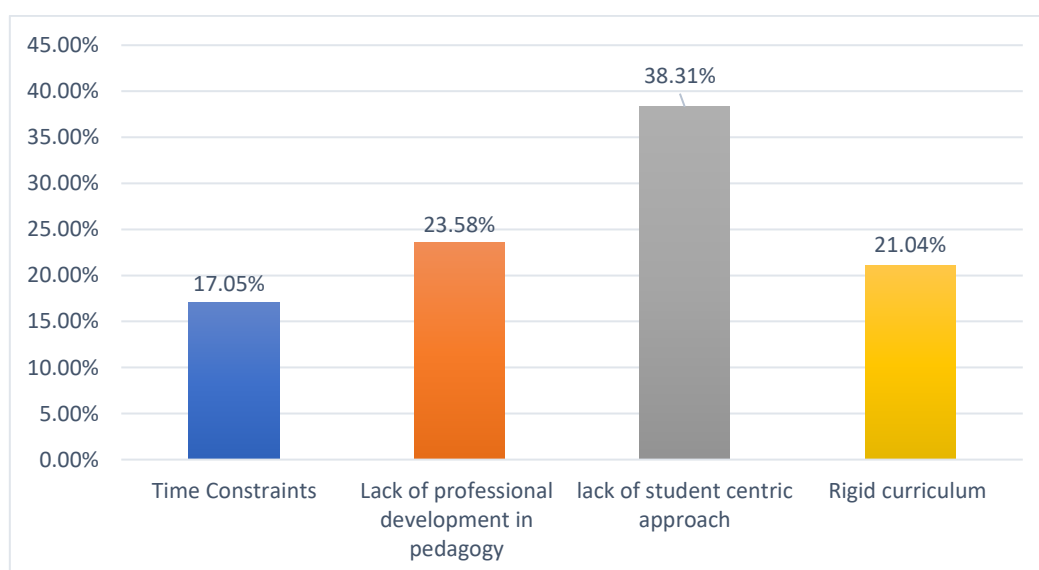

Figure 4.1.43: Percentage of factors related to over emphasize Content over Pedagogy

Regarding to barriers of over emphasize content over pedagogy,17.05% views about time constrainst.23.58% Pre-service teachers responded that lack of professional development in pedagogy create the problem of over emphasize content over pedagogy. Lack of student centric approach (38.31%) is the leading factor towards over emphasize content over pedagogy. Rigid curriculum(21.04%) is one of the drawback towards the issue of over emphasize content over pedagogy.

4.17 Data analysis and interpretation of objective no 13

To study different suggestive measures suggested by Pre-service teachers regarding barriers during classroom transaction

In the present objective the data has been analysed on the basis of recommendations and suggestions received from the respondents. The data are gathered from Pre-service teachers from the sampled districts of Assam. To collect the data, open ended questionnaire has been used for the Pre-service teachers.

Suggestions for overcoming barrier faced by the Pre-service teacher:

The responses that are received from the respondents are categorized under four dimensions viz- (i) Suggestions related to Adoption of technology ii) Suggestions related to Communication skill iii) Suggestions related to Pedagogical practices iv) Suggestions related to Curriculum and subject matter
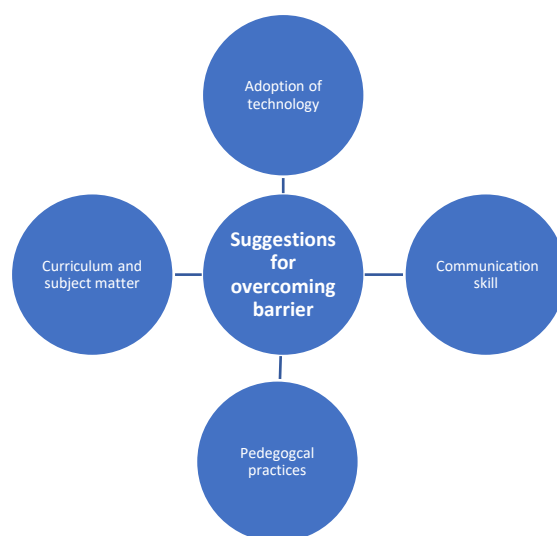
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Figure 4.1.44: Suggestions for overcoming barrier in terms of Classroom transaction

i)The suggestions which have been received from the respondents for Adoption of technology are as follows:

It has been discovered that the majority of Pre-service teachers anticipate to have access to key software (such as Microsoft Office, Google Suite, and specific educational apps) for lesson planning and research. It allows for more interactive lessons, which improves learner engagement and effectiveness. Teacher educators should encourage Pre-service teachers to seek out resources, online courses, or tutorials to master new tools on their own. Providing opportunities for individual tech projects fosters a proactive, self-motivated learning attitude that they can replicate for their future students.

During their own instruction, teacher educators should set an example of diverse and effective technology use. For example, employing interactive whiteboards, digital quizzes, and collaborative platforms such as Google Classroom or Padlet can show how technology can help with participation, organization, and feedback. One of the comments that the respondents received was that "***Provide opportunity to explore new technologies include enhanced comfort with digital tools, for creative experimentation, reduced pressure, and the ability to develop more effective, confident tech integration in future lessons"*** *(p67).*

Some have put forward that Teacher educator must facilitate discussions and reflections, asking guiding questions about their learning journey and tech integration. One of the respondents suggested to "***Use step-by-step approach to integrating technology into teaching, beginning with small, achievable activities and gradually moving to more advanced ones.*"** **(p15)**

A significant number of Pre-service teachers suggested offering professional development opportunities. Technology is constantly evolving, and Pre-service teachers want ongoing support and professional development opportunities to keep up with new tools and techniques. This could include access to online resources, ongoing training and mentoring, and the ability to attend conferences and seminars (Liu & Song, 2019). One respondent proposed including "***hands-on training and strategies for managing technology-related tasks, while encouraging instructors to collaborate and share effective techniques.*"** **(p43).**

It is expected that Pre-service teachers will take the time to examine how experienced teachers incorporate technology into their lessons. Those in charge of the school or district can look for veteran educators who are comfortable with technology and are prepared to guide future educators. A more tailored mentoring experience can be achieved by matching them based on subject area or grade level preferences. They can gain insight from an educator who has worked with classroom technology in a hands-on capacity. They may observe the immediate impact of technology on assessment, student engagement, and lesson planning.

Legislators and the government should allocate sufficient cash to modernize schools' technology infrastructure, which encompasses software, hardware, internet connectivity, and technical support services, according to Pre-service teachers. Basic technology is lacking in many schools, particularly those located in rural or economically disadvantaged areas. By investing in the right infrastructure, we can ensure that all educators and students have equal access.

To guarantee that Pre-service teachers have the background, understanding, and self-assurance to successfully integrate technology into their lessons, teacher preparation programs should include digital literacy and technological pedagogy. The mandatory incorporation of technology pedagogy and digital literacy into teacher preparation programs need to be a top priority for policymakers. *"Teacher preparation programs should be updated to incorporate courses or modules on digital literacy, pedagogical use of technology, and how to assess tech-based student learning." One respondent viewed this information."* (p32)

ii) The suggestions which have been received from the respondents for Classroom Communication skills are as follows:

More than half of Pre-service teachers agreed that having clear lesson plans and well-prepared instructional materials is essential for effective teaching and learning. Research shows that misunderstanding and confusion during classroom instruction might perpetuate perplexity because students do not seek clarification on misunderstood topics. Teacher educators can establish a model and illustrate how to produce structured and well-organized lesson plans that Pre-service teachers can follow and alter. One of the respondents says: *"Clear lesson plans and well-prepared instructional materials is important because it ensures structure and clarity,*

promotes effective time management, enhances student engagement, supports consistent learning outcomes, and boosts teacher confidence in delivering lessons" *(p75)*

It has been proposed that teacher educators provide realistic classroom scenarios for role-playing, such as parent-teacher conferences, student discussions, or dispute resolution situations. This enables pre-service instructors to practice in a low-stakes setting. Regular reflection enables continual improvement of verbal and nonverbal communication skills, resulting in clearer and more successful interactions in class. It provides Pre-service teachers with methods for managing disagreements and tough conversations more successfully, resulting in a more positive classroom climate.

Pre-service teachers suggested to offer feedback that encourages them to reflect on their teaching practice. Feedback serves as a guide to help people improve their communication skills, leading to a better knowledge of how effective communication affects classroom dynamics, student engagement, and professional relationships. Teacher educator must offer regular, constructive feedback on communication during teaching practice, group discussions, and presentations.

Most teachers-to-be think that workshops, seminars, and other events are good ways to improve their communication skills. For Pre-service teachers to practice and improve their communication skills in a safe environment, the administration should hold workshops on specific communication skills, like active listening, feedback, and public speaking. There may be conversations and games for everyone to take part in at these seminars. Someone said: "***Making workshops compulsory is highly beneficial for consistent practice, foster peer collaboration, and allow for focused, guided learning on topics like classroom management, lesson planning, and using technology effectively."*** *(p28)*

There have also been suggestions for giving experienced mentors to help Pre-service teachers strengthen their communication skills. They provide detailed, concrete criticism on teaching techniques, assisting mentees in refining their communication style and addressing any difficulties. Mentors assist mentees in identifying what works effectively and where they need to improve by guiding them to reflect on their communication experiences. Administrators are responsible for establishing a clear

structure and framework for mentorship programs. Mentors must get continual training to ensure they have the essential tools to support Pre-service teachers.

Physical impediments can have a substantial impact on communication skills, particularly in educational or business environments. Insufficient access to communication technologies (such as video conferencing software or projectors) might impede effective information sharing, particularly in remote or hybrid environments. To improve remote connection, pre-service teachers wanted to provide access to trustworthy communication equipment such as video conferencing software, projectors, and interactive displays. The administration must set aside funds to obtain licenses or subscriptions to dependable communication technologies.

Pre-service teachers believed that familiarity with digital platforms improves communication abilities because they provide a variety of methods for engaging, communicating, and successfully conveying knowledge. Policymakers should develop teacher education programs that address digital communication subjects such as virtual teaching, online collaboration, and safe online communication practices with students and parents.

A significant number of Pre-service educators contend that engagement in communication-centric professional networks fosters peer learning and ongoing enhancement of communication abilities. Policymakers ought to endorse initiatives that promote continuous communication skill enhancement for educators throughout their professional trajectories. According to one respondent, "***Professional development classes, webinars, or certifications helps to improve communication-related fields." (p91)***

iii)The suggestions which have been received from the respondents for Pedagogical practices are as follows:

Nearly all of Pre-service teachers intended to use a student-centred approach to classroom instruction. Classroom instruction fosters students' growth in self-awareness, analytical reasoning, and accountability by providing them with opportunities to reflect on and make sense of their own learning. Educators of future teachers have a responsibility to provide their students with cutting-edge strategies for effective classroom instruction. Provide them with an overview of instructional technologies and guide them through the process of effectively utilizing these tools. A

participant said: "*Use strategies like the three-step process where we learn to first think individually about a question, then pair with a classmate to discuss, and finally share our thoughts with the class."* (P53)

A sufficient number of Pre-service teachers have suggested providing suitable training to build good lesson plans. A well-crafted lesson plan serves as a clear road map for teachers, ensuring that they remain focused on learning objectives and instructional goals. Teacher educators frequently show students how to build a lesson plan by presenting the components and structure of an effective lesson, such as objectives, materials, activities, evaluations, and reflection. This teaches kids how to plan their own schedules. According to one of the respondents, "*Lesson plans provide reference for later reflection, allowing them to assess what worked well, what could be improved, and how they can adapt their teaching strategies in the future"* (p87).

Pre-service teachers feel that constructive criticism of their pedagogical practices and classroom management strategies is critical to their professional development. The activity encourages introspection over individual lessons, interactions with students, and strategies for managing the classroom. Review publications on a regular basis and offer helpful criticism. Using feedback mechanisms on a regular basis allows pre-service teachers to get valuable insights into their teaching methods and classroom dynamics. Teacher educators help future educators assess their own abilities and growth areas by offering constructive criticism. Through introspection, they are able to enhance their communication, pedagogical, and classroom management skills, all of which contribute to lifelong learning.

In order to facilitate efficient pedagogical practices, Pre-service instructors sought out appropriate classroom amenities. Supplying classrooms with essential technology like laptops, iPads, interactive whiteboards, and dependable Internet connectivity will enable a range of instructional activities. To foster an adaptive and student-centred learning environment, designate areas where students can share feedback on courses or classroom resources. Classrooms need fundamental infrastructure that administrators should guarantee, including sufficient seating, lighting, ventilation, and temperature regulation.

To cultivate a pleasurable and stimulating learning environment, most Pre-service teachers underscored the necessity of creating a suitable context for educational

activities. An optimal environment would promote the growth of both students and educators, facilitating the broadening of their intellectual and personal perspectives. School administrators should cultivate an environment in which educators feel secure experimenting with innovative educational methods. Exploring methodologies such as project-based learning, flipped classrooms, inquiry-based learning, and personalized learning paths may be classified within this domain.

The development of Pre-service teachers depends on giving them opportunities to learn and practice experiential learning methods. In order to overcome challenges like managing a classroom or delivering lessons effectively, most Pre-service teachers recommended employing simulations to mimic real-life classroom situations. Lawmakers should incorporate a range of classroom-relevant activities, such as simulations, role-playing, and problem-solving, into the program.

iv)The suggestions which have been received from the respondents for Curriculum and subject matter are as follows:

Pre-service teachers said that teacher educators should use project-based assessments, portfolios, and performance activities to allow students to demonstrate their understanding in a variety of ways. Instead, then depending entirely on high-stakes tests, conduct regular, low-stakes evaluations to track progress and provide feedback. Most Pre-service teachers suggested holding workshops to provide them with resources and tactics for a variety of evaluation methodologies and innovative teaching practices.

Indeed, the majority Pre-service teachers believe mentorship is essential to their professional growth. Teacher educators must give students comments and support to boost their teaching confidence as mentors. Mentors help Pre-service teachers enhance their teaching using real-world solutions and best practices. In regard to curricular planning, one respondent believes that "mentor support helps to transition more smoothly from theory to practice, enhances instructional skills, and fosters professional identity, all of which contribute to success and longevity in the teaching profession." (p71)

Pre-service teachers should learn to build curriculum that integrates theory and practice. Teacher educators should employ real-world scenarios, case studies, and

classroom observations to assist Pre-service teachers apply theory to classroom practice.

Pre-service teachers thought curriculum development should involve students and other stakeholders. Education administrators should encourage teachers, subject matter experts, and other stakeholders to collaborate on curriculum creation. This could involve organizing time and place for teachers to meet, debate, and share ideas to improve curriculum and instruction.

It has been suggested that there have need resources to build and implement curricula. Administrators must provide Pre-service teachers with textbooks, instructional aids, technology, and learning materials to implement the program. Curriculum needs should determine budget allocations to provide updated instructional tools and materials.

Pre-service teachers advocated for the inclusion of multicultural education and pedagogical approaches in the classroom. All children, including those from disadvantaged families, English language learners, and those with disabilities, have unique requirements, and policymakers should seek to ensure that these needs are met.

The incorporation of technological tools into classroom instruction was supported by most Pre-service instructors. Training in educational technology needs to be improved, and students need to be taught how to effectively use it in their own classrooms. To make sure that every Pre-service teachers has the chance to learn important tech skills, policy maker should establish a plan that puts an emphasis on digital literacy and incorporates technology into the curriculum in various ways. One participant stated, **"The incorporation of technology enhances traditional learning experiences, making them more interesting, accessible, and relevant." (p50)**