

# Exploring the Pattern of Cognitive Test Anxiety among PG Students: A Cluster Analysis

Barun Patra<sup>1</sup>, Bishal Das<sup>2</sup>, Dr. Munmun Banerjee<sup>3</sup>

<sup>1&2</sup>Research Scholar, Department of Education, Sidho-Kanho-Birsha University, Purulia, West Bengal

<sup>3</sup>Assistant Professor, Department of Education, Sapatgram College, Dhubri, Assam

**Abstract:** *This study explored cognitive test anxiety (CTA) among postgraduate students by grouping them based on gender, academic stream, and residence to see which factors were most important in different cluster sizes. Descriptive survey design used in this study and data were chosen with the 'Cognitive Test Anxiety Scale' (CTAS) by Jerrell Cassady and Ronald Johnson (2002), which includes 27 items on a four-point Likert scale. The analysis focused on how students were grouped and which predictors mattered most in each cluster solution. Results explored that gender, academic stream, and residence were consistently important in forming clusters. In case of smaller clusters, these demographic factors were stronger predictors, while 'cognitive test anxiety' had less influence at first. As the number of 'clusters' increased, CTA became more important and the main predictor in the ten-cluster solution. The study concludes that 'demographic' factors strongly affect how postgraduate students are grouped, and cognitive test anxiety becomes more important when looking at more detailed cluster structures.*

**Keywords:** *Cognitive, Anxiety, Cluster, Postgraduate Students, Predictor*

## I. INTRODUCTION

In academic context This anxiety often arises when students anticipate evolution of their knowledge or abilities Anxiety is a negative emotional or mental condition that people experience It can take many different forms including cognitive test anxiety. Cognitive text anxiety refers to the worry and fear students experience regarding their ability to perform well in examination Bakete and Akurugu (2023). CTA is one kind of negative feeling for failing the exam and this fear affect the 'academic performance' of the students. to explore this anxiety researcher chose cluster analysis. This analysis manages large data and reduces complexity. by this analysis scholar discovers the relationship among the data sets Mahato et al. (2023). This method used many times in case of quantitative research. In recently Mahato et al. (2024) and Das et al. (2024) used this method for revealed an insight. From many kinds of methods, cluster analysis used as a very powerful technique to find out the relationship of the data sets Sen et al. (2023).

## II. REVIEW OF RELATED LITERATURE

Ansary and Mandal (2024) found that there is a negative correlation among 'anxiety' and 'academic achievement' and no difference revealed from gender, stream, and also the residence. Kaur (2023) found that urban students had a less anxiety than 'rural students' and there was a significant difference among the students of science, commerce and humanities. Fatima (2022) found that no 'significant difference' among 'boys' and 'girls' in case of test anxiety. Chattopadhyay and Sahoo (2022) revealed a negative relationship among academic achievement and test anxiety. Kaushal and Tewari (2021) and Bit (2021) found that there is a significant difference among boys and girls. Pagaria (2020) showed that there is a significance difference between 'male and female' college students on test anxiety. Roy Chowdhury (2019) found that around 39.67% of 'secondary school' students have high level of exam anxiety. Alam and Halder (2018) revealed that there is 'significant negative' correlation between 'test anxiety' and 'adjustment' among secondary students. Rani (2017) found that 'male and female' differ significantly on the level of 'test anxiety'. Anxiety is higher among female students than male students. Compared to high socioeconomic groups, 'test anxiety' was higher in low socioeconomic groups. Ahsan and Kumar (2016) found that there is a negative correlation between



test anxiety and study habits. Msayar et al. (2016) found that there was a statistically significant difference between ‘male and female’ in their academic self-regulation but there was no statistically significant difference between ‘male and female’ in their test anxiety. Das (2023) applied Mahalanobis distance as a composite index of ‘Lifestyle of Health and Sustainability’ (LOHAS) and demonstrated that it effectively captured multidimensional lifestyle variations, providing a robust metric for assessing sustainability-oriented health behaviour among students. Mahato and Das (2024) studied mental well-being across gender, institution, and residence, finding significant socio-demographic differences in student mental health. Sen et al. (2025) analysed environmental attitudes through clustering and identified distinct attitude-based groups, reflecting varying levels of ‘environmental awareness’ among students. Mahato and Das (2024) revealed a significant difference among gender in case of healthy sustainable lifestyle. Das (2025) found that a significant difference among ‘demographic groups’ in internet addiction. Mahato et al. (2024) explored changes by using Mahalanobis distance in language achievement among class VII. Bera (2023) explored that there was a significant difference between ‘boys and girls’ but ‘academic achievement’ and test anxiety negatively correlated. Das (2025) reported a moderate level adaptation of sustainable practices among youth. Mahato, Das, and Gayen (2024) found language achievement in case of gender and institution type. Das (2025) revealed that merging such approach of pedagogies is mostly supportive for sustainable and meaningful learning. Mahato and Das (2024) found a significant difference among the groups by using t-test and Mahalanobis distance. Das (2025) explored high internet addiction by using clustering method with students. Mondal and Mahato (2025) explored that ‘gender and residence’ strongly influenced to create ‘clusters’ and stream played a moderate role whether the role of CTA increased when the number of ‘clusters’ are increased.

Sen et al. (2025) validated the ‘Positive Mental Health scale’ among Bengali-speaking students in India and Bangladesh, demonstrating strong reliability and construct validity; while overall PMH favoured Indian students, gender differences were largely non-significant except among female students across countries. Bauri and Mahato (2025) analysed problematic mobile phone use among postgraduates and found ‘no significant differences’ across gender, residence, or discipline, suggesting digital overuse as a pervasive and demographically inclusive issue. Das and Mahato (2024) investigated the relationship between lifestyle patterns and sustainability practices, revealing a significant ‘positive correlation’ between healthier lifestyles and sustainable behaviours. Roy and Mahato (2025) applied cluster analysis to smartphone addiction and observed that predictor importance varied by cluster size, revealing complex demographic interactions in addiction patterns. Das and Mahato (2024a) examined positive mental health using clustering techniques and identified distinct mental health profiles, indicating heterogeneity in student well-being and the value of cluster-based strategies. Das and Mahato (2024b) compared correlations between LOHAS and its components among rural and urban students using Fisher’s Z-transformation, revealing significant contextual differences. Das et al. (2023a) compared LOHAS levels across student groups and found significant group-wise differences, indicating variability in sustainability-oriented lifestyles. Patra and Mahato (2025) conducted a confirmatory factor analysis of problematic mobile phone use and reported strong reliability and structural validity, supporting the scale as a robust assessment tool. Das et al. (2023b) assessed overall LOHAS status among undergraduates in Purulia district and reported an average level, suggesting scope for improvement through awareness initiatives. Das et al. (2024) examined variations in relationships among LOHAS components across academic streams and identified significant disciplinary differences influencing sustainability behaviours. Das et al. (2023) applied clustering to analyse LOHAS patterns and identified multiple lifestyle clusters, reflecting diverse health and sustainability orientations among students. Mohanta and Mahato (2025) examined transformative women’s contributions to education and social reform, highlighting their enduring impact on gender equality, liberation, and intersectional social justice movements. Kundu and Mahato (2025) comparatively analysed Mary Wollstonecraft’s rationalism and Aurobindo Ghosh’s spiritual integralism, concluding that their complementary visions offer diverse pathways for human and societal development. Ghosh et al. (2025) validated writing skill dimensions through structural equation modelling and supported a dominant single-factor model of writing proficiency, despite mixed fit indices, confirming strong underlying construct consistency. Patra and Mahato (2025) investigated ‘test anxiety’ among ‘higher



secondary' students and found significant gender and stream differences, though rural-urban differences were non-significant. Ghosh et al. (2026) conducted cluster analysis of English writing proficiency among Bengali-medium secondary students and found Content Organization as a consistent key predictor, with vocabulary, grammar, mechanics, gender, residence, class, and first-generation learner status contributing variably yet significantly to writing development. Lufi and Darliuk (2005) examined exam anxiety among adolescents with and without learning disabilities (LD), finding lower verbal IQ in the LD group but no significant personality differences based on LD status among test-anxious teens. Furlan et al. (2009) revised the 'Cognitive Test Anxiety' Scale for university students and demonstrated its suitability for cross-cultural research among Argentinean and American samples. Putwain et al. (2010) analysed cognitive biases in the relationship between 'test anxiety' and exam performance, showing that 'academic achievement' was fully mediated by domain-related cognitive distortions linked to worry and physiological symptoms. Facca and Allen (2011) demonstrated that cluster analysis is an effective tool for classifying students based on emotionally intelligent leadership behaviours, enabling tailored educational interventions. Saha (2012) compared 'environmental awareness' among teacher candidates in West Bengal and found no gender differences, though in-service and science candidates showed higher awareness than pre-service and humanities candidates. Akinsola and Nwajei (2013) studied 'test anxiety', 'depression', and academic performance, reporting no gender differences in test anxiety but significant correlations between test anxiety, trait anxiety, and depression. Mondal and Saha (2013) compared scientific achievement among secondary students in Darjeeling district, identifying significant gender and rural-urban differences in science performance. Rana and Mahmood (2013) assessed test anxiety among Pakistani university students and found a significant negative correlation between anxiety levels and academic achievement. Sen et al. (2013) examined low achievement in higher secondary physics in Birbhum district, revealing a significant proficiency gap between secondary and higher secondary science students. Kar et al. (2014) reported favourable student attitudes toward 'online education', unaffected by region, gender, or academic stream. Kar et al. (2014a) found that 'home environment' significantly influenced emotional intelligence among secondary students, while gender had minimal impact. Ansari (2015) identified a 'significant inverse' relationship between emotional maturity and stress among undergraduates, with lower emotional maturity associated with higher stress. Kundu et al. (2015) observed no gender-based differences in 'adjustment abilities' among 'humanities and science' undergraduates, despite disparities among highly competent individuals. Amalu (2017) established 'cognitive test anxiety' as a significant predictor of 'academic performance' among secondary students using regression analysis. Bethel-Eke and Ikpa (2017) reported that cognitive test anxiety is prevalent among secondary students regardless of age, gender, or residence. Mondal and Saha (2017) found that secondary teachers with higher emotional intelligence reported greater job satisfaction. Paul et al. (2017) determined that boys exhibited higher creativity than girls, with no rural-urban differences or interaction effects. Roy et al. (2017) found that B.Ed. students' attitudes toward 'inclusive education' were not significantly influenced by gender, residence, or stream. Rasouli et al. (2018) showed that cognitive learning strategy training reduced 'test anxiety' and improved academic performance among female guidance school students. Krispenz et al. (2019) demonstrated that enhanced academic self-efficacy reduced 'test anxiety' and academic procrastination, with self-efficacy mediating anxiety reduction. Iorga et al. (2019) identified high levels of stress, anxiety, and depression among medical students during academic training. Arsha and Biswas (2020) found strong associations between Bangladeshi students' mental health and behavioural factors such as family living, sleep, diet, and parental interaction. Khan et al. (2020) reported a significant direct relationship between test anxiety and study skills among Nigerian students. Maxwell and Ikechukwu (2020) identified a strong correlation between cognitive test anxiety and examination misconduct, alongside psychological distress indicators. Ali et al. (2021) showed that lower 'cognitive test anxiety' corresponded with higher SSC exam performance. Gayen and Sen (2021) reported significant correlations among anxiety, stress, and depression among female 'postgraduate students' during COVID-19. Saha et al. (2021) applied clustering to analyse 'college students' attitudes toward yoga, noting similar perspectives among rural students and the influence of institutional location. Pate et al. (2021) found that 18% of pharmacy students experienced significant test anxiety affecting academic performance. Saha (2021) reported that attitudes toward yoga varied by residence and



stream but not by gender. Sen et al. (2021) found no significant ‘gender’, department, or semester differences in stress, anxiety, and depression among postgraduates during COVID-19. Gorain et al. (2022) identified three clusters linking personality, social isolation, and internet dependency, with generally low to moderate correlations. Nafuri et al. (2022) compared clustering models for categorising underperforming higher education students and found optimised k-means most effective in generating performance-based clusters. Adhikari et al. (2023) identified significant relationships among depression, anxiety, stress, and self-efficacy among postgraduate students. Adhikari and Sen (2023) found similar perceptions of ‘organisational climate’ and ‘institutional commitment’ across gender and rural-urban settings. Adhikari and Sen (2023a) demonstrated that increasing cluster numbers enhances predictor influence and socio-psychological differentiation in educational research. Bakete and Akurugu (2023) found no grade-level differences in cognitive test anxiety, though female students reported higher anxiety. Ansary et al. (2023) applied clustering to value-oriented education attitudes and found location as the strongest predictor, with no link to academic achievement. Mahato et al. (2023) confirmed significant interrelationships among ‘self-efficacy’, ‘stress’, ‘anxiety’, and depression among postgraduate students. Mahato et al. (2023) found no relationship between ‘internet addiction’ and academic resilience, though gender differences emerged in ‘internet addiction’ levels. Gayen (2024) showed that predictor complexity in smartphone addiction clustering increased with cluster numbers, with location and stream emerging as strong determinants. Ansary and Khatun (2025) found no significant gender or rural-urban differences in stress, anxiety, depression, or smartphone addiction among undergraduates. The application of the t-test has become highly prevalent in contemporary educational research as a robust parametric technique for examining mean differences between groups. Numerous empirical studies have relied on this method to investigate academic, psychological, and behavioural variables, including Gayen and Sen (2023); Mondal et al. (2018); Gayen et al. (2021); Ansary et al. (2021); Rajak and Gayen (2022); Ansary et al. (2022); Dandapat et al. (2021); Khatun et al. (2022); Adhikari et al. (2023); Karmakar et al. (2016); Mahato and Sen (2021); Mahato and Sen (2023); Ansary (2023); Ansary and Rakshit (2024); Mahanti, Mondal, and Saha (2016) and Khan et al. (2023), thereby strengthening comparative analysis within educational settings. Correlation analysis has likewise played a crucial role in advancing educational and psychological research by examining the strength and direction of relationships among variables. Studies such as Kar and Saha (2021); Sutradhar and Sen (2022); Sutradhar et al. (2023); Sen et al. (2023); and Das and Mahato (2024a) have extensively employed correlational techniques to explore inter-variable dynamics, contributing to a deeper understanding of associative patterns in educational contexts. Cluster analysis has emerged as a powerful multivariate classification technique in educational research, conceptually aligned with distance-based measures such as Mahalanobis distance for identifying homogeneous subgroups within heterogeneous populations. Its application is evident in studies by Mahato and Sen (2021); Sen and Pal (2020), where it has been used to uncover latent group structures and complex predictor patterns. The Mann-Whitney U test has been substantially utilized in non-parametric educational research, particularly when data violate normality assumptions. Investigations such as Saha and Adhikari (2021); Halder et al. (2022); and have effectively applied this technique to compare independent groups, demonstrating its utility in analysing ordinal or non-normally distributed educational data.

#### **Objectives of the study:**

1. To explore ‘Cognitive Test Anxiety’ by creating clusters based on Residence, Gender and Stream of Postgraduate students.
2. Find out the importance of the role of ‘predictors’ in ‘cluster’ formation.

### **III. METHODOLOGY**

**Research Design:** ‘Descriptive survey’ design conducted for this study.

**Population and Sample:** Postgraduate students are included and stratified random sampling used to collect 294 samples.



**Research Tool:** Data were collected by using ‘Cognitive Test Anxiety scale’ employed by Cassidy and Johnson (2002).

**IV. FINDINGS OF THE STUDY**

**Result and Discussion:**

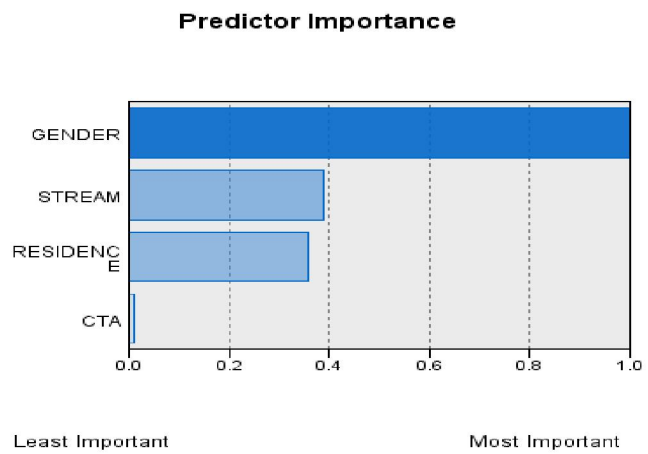
**Table 1: Formation of Two Step -Clusters:**

**Clusters**

Input (Predictor) Importance  
 ■ 1.0 ■ 0.8 ■ 0.6 ■ 0.4 ■ 0.2 ■ 0.0

Cluster	2	1
Label		
Description		
Size	64.6% (164)	35.4% (90)
Inputs	GENDER female (100.0%)	GENDER male (90.0%)
	RESIDENCE rural (100.0%)	RESIDENCE rural (70.0%)
	CTA 60.18	CTA 58.61
	STREAM arts (100.0%)	STREAM arts (100.0%)

**Figure 1: Predictors of Two Step Clusters**



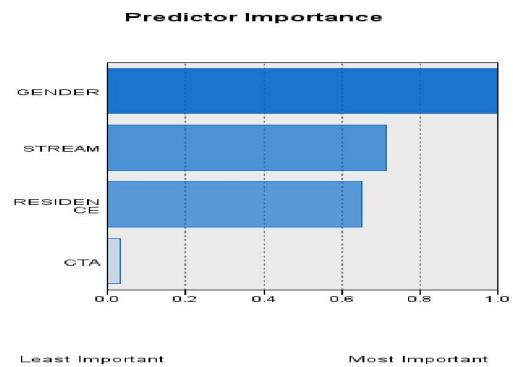
**Table 2: Formation of Three Step Clusters**

**Clusters**

Input (Predictor) Importance  
 ■ 1.0 ■ 0.8 ■ 0.6 ■ 0.4 ■ 0.2 ■ 0.0

Cluster	3	1	2
Label			
Description			
Size	64.6% (164)	24.8% (63)	10.6% (27)
Inputs	RESIDENCE rural (100.0%)	RESIDENCE rural (100.0%)	RESIDENCE urban (100.0%)
	GENDER female (100.0%)	GENDER male (100.0%)	GENDER female (66.7%)
	CTA 60.18	CTA 56.81	CTA 62.48
	STREAM arts (100.0%)	STREAM arts (100.0%)	STREAM arts (100.0%)

**Figure 2: Predictors of Three Step Clusters**



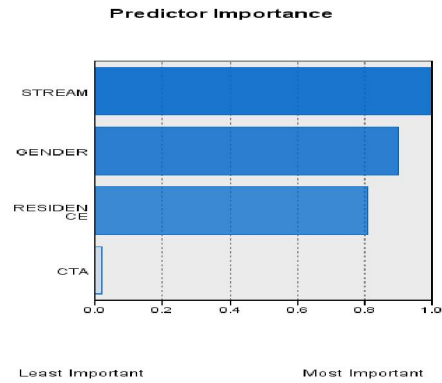
**Table 3: Formation of Five Step Clusters**

Clusters

Input (Predictor) Importance  
 1.0 0.8 0.6 0.4 0.2 0.0

Cluster	5	1	4	2	3
Label					
Description					
Size	43.7% (111)	24.6% (63)	20.9% (53)	7.1% (18)	3.5% (9)
Inputs	GENDER female (100.0%)	GENDER male (100.0%)	GENDER female (100.0%)	GENDER female (100.0%)	GENDER male (100.0%)
	RESIDENCE rural (100.0%)	RESIDENCE rural (100.0%)	RESIDENCE rural (100.0%)	RESIDENCE urban (100.0%)	RESIDENCE urban (100.0%)
	CTA 53.85	CTA 56.81	CTA 73.43	CTA 64.22	CTA 59.00
	STREAM arts (100.0%)	STREAM arts (100.0%)	STREAM arts (100.0%)	STREAM arts (100.0%)	STREAM arts (100.0%)

**Figure 3: Predictor of Five step Clusters**



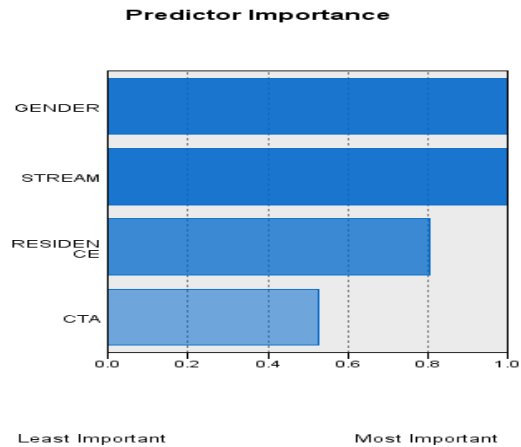
**Table 4: Formation of Seven Step Clusters**

Clusters

Input (Predictor) Importance  
 1.0 0.8 0.6 0.4 0.2 0.0

Cluster	7	1	6	4	3	2	5
Label							
Description							
Size	37.8% (111)	21.4% (63)	18.0% (53)	8.5% (25)	6.1% (18)	5.1% (15)	3.1% (9)
Inputs	GENDER FEMALE (100.0%)	GENDER MALE (100.0%)	GENDER FEMALE (100.0%)	GENDER FEMALE (100.0%)	GENDER FEMALE (100.0%)	GENDER MALE (100.0%)	GENDER MALE (100.0%)
	STREAM ARTS (100.0%)	STREAM ARTS (100.0%)	STREAM ARTS (100.0%)	STREAM SCIENCE (100.0%)	STREAM ARTS (100.0%)	STREAM SCIENCE (100.0%)	STREAM ARTS (100.0%)
	RESIDENCE RURAL (100.0%)	RESIDENCE RURAL (100.0%)	RESIDENCE RURAL (100.0%)	RESIDENCE RURAL (100.0%)	RESIDENCE URBAN (100.0%)	RESIDENCE RURAL (100.0%)	RESIDENCE URBAN (100.0%)
	CTA 53.85	CTA 56.81	CTA 73.43	CTA 62.40	CTA 64.22	CTA 59.00	CTA 59.00

**Figure 4: Predictors of Seven Step Clusters**



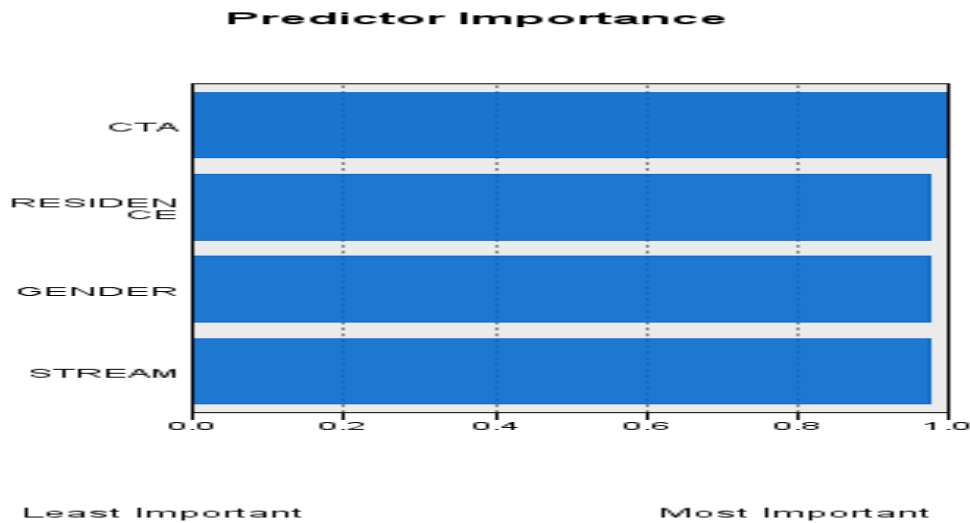
**Table 5: Formation of Ten Step Clusters**

Clusters

Input (Predictor) Importance  
 1.0 0.8 0.6 0.4 0.2 0.0

Cluster	8	9	2	7	1	4	3	10	5	6
Label										
Description										
Size	23.5% (69)	19.0% (56)	13.6% (40)	13.3% (39)	7.8% (23)	6.1% (18)	5.1% (15)	5.1% (15)	3.4% (10)	3.1% (9)
Inputs	CTA 61.19	CTA 48.18	CTA 62.68	CTA 75.62	CTA 46.61	CTA 64.22	CTA 58.60	CTA 59.53	CTA 66.70	CTA 59.00
	GENDER FEMALE (100.0%)	GENDER FEMALE (100.0%)	GENDER MALE (100.0%)	GENDER FEMALE (100.0%)	GENDER MALE (100.0%)	GENDER FEMALE (100.0%)	GENDER MALE (100.0%)	GENDER FEMALE (100.0%)	GENDER FEMALE (100.0%)	GENDER MALE (100.0%)
	RESIDENCE RURAL (100.0%)	RESIDENCE RURAL (100.0%)	RESIDENCE RURAL (100.0%)	RESIDENCE RURAL (100.0%)	RESIDENCE RURAL (100.0%)	RESIDENCE URBAN (100.0%)	RESIDENCE RURAL (100.0%)	RESIDENCE RURAL (100.0%)	RESIDENCE URBAN (100.0%)	RESIDENCE URBAN (100.0%)
	STREAM ARTS (100.0%)	STREAM ARTS (100.0%)	STREAM ARTS (100.0%)	STREAM ARTS (100.0%)	STREAM ARTS (100.0%)	STREAM ARTS (100.0%)	STREAM SCIENCE (100.0%)	STREAM SCIENCE (100.0%)	STREAM SCIENCE (100.0%)	STREAM ARTS (100.0%)

**Figure 5: Predictor of Ten Step Clusters**



**Table 6: Represent the Overall Cluster Summary in High Predictors to Low Predictors**

Number of Cluster	Very High Predictors	High Predictors	Mediocre Predictors	Low Predictors	Very Low Predictors
2	Gender			Residence and stream	CTA
3	Gender	Stream and residence			CTA
5	Stream, Gender and residence				CTA
7	Gender, stream and residence		CTA		
10	Residence, gender, stream and CTA				

**For Tables of the study**

Table 1 represent that cluster 1 filled with 35.4% with sample size 90. In case of gender 80.0% male students are involved with 70.0% rural students and 100.0% arts students with 58.51% ‘cognitive test anxiety’. Cluster 2 made up by 64.6%with sample size 164. In case of gender 100.0% female students are involved with 100.0% rural and 100.0% arts students with 60.18% ‘cognitive test anxiety’.

Table 2 represent that cluster 1 filled with 24.8% with sample size 63. In case of gender 100.0% male students are involved with 100.0% rural students and 100.0% arts students with 56.81% ‘cognitive test anxiety’. Cluster 2 made up by 10.6%with sample size 27. In case of gender 66.7% female students are involved with 100.0% urban and 100.0% arts students with 62.48% ‘cognitive test anxiety’. cluster 3 filled with 64.6% with sample size 164. In case of gender 100.0% female students are involved with 100.0% rural students and 100.0% arts students with 60.18% ‘cognitive test anxiety’.

Table 3 represent that cluster 1 filled with 24.8% with sample size 63. In case of gender 100.0% male students are involved with 100.0% rural students and 100.0% arts students with 56.81% ‘cognitive test anxiety’. Cluster 2 made up by 7.1%with sample size 18. In case of gender 100.0% female students are involved with 100.0% urban and 100.0% arts students with 64.22% ‘cognitive test anxiety’. cluster 3 filled with 3.5% with sample size 9. In case of gender 100.0% male students are involved with 100.0% urban students and 100.0% arts students with 59.00% ‘cognitive test anxiety’. Cluster 4 made up by 20.9%with sample size 53. In case of gender 100.0% female students are involved with 100.0% rural and 100.0% arts students with 73.43% ‘cognitive test anxiety’. cluster 5 filled with 43.7% with sample size 111. In case of gender 100.0% female students are involved with 100.0% rural students and 100.0% arts students with 53.85% ‘cognitive test anxiety’.

Table 4 represent that cluster 1 filled with 21.4% with sample size 63. In case of gender 100.0% male students are involved with 100.0% rural students and 100.0% arts students with 56.81% ‘cognitive test anxiety’. Cluster 2 made up by 5.1%with sample size 15. In case of gender 100.0% male students are involved with 100.0% rural and 100.0% science students with 58.60% ‘cognitive test anxiety’. cluster 3 filled with 6.1% with sample size 18. In case of gender 100.0% female students are involved with 100.0% urban students and 100.0% arts students with 64.22% ‘cognitive test anxiety’. Cluster 4 made up by 8.5%with sample size 25. In case of gender 100.0% female students are involved with 60.0% rural and 100.0% science students with 73.43% ‘cognitive test anxiety’. cluster 5 filled with 3.1% with sample size 9. In case of gender 100.0% male students are involved with 100.0% urban students and 100.0% arts students with 59.00% ‘cognitive test anxiety’. Cluster 6 made up by 18.0%with sample size 53. In case of gender 100.0% female students are involved with 100.0% rural and 100.0% arts students with 73.43% ‘cognitive test anxiety’. cluster 7 filled with 37.8% with sample size 111. In case of gender 100.0% female students are involved with 100.0% rural students and 100.0% arts students with 53.85% ‘cognitive test anxiety’.

Table 5 represent that cluster 1 filled with 7.8% with sample size 23. In case of gender 100.0% male students are involved with 100.0% rural students and 100.0% arts students with 46.61% ‘cognitive test anxiety’. Cluster 2 made up by 13.6%with sample size 40. In case of gender 100.0% male students are involved with 100.0% rural and 100.0% arts



students with 62.68% 'cognitive test anxiety'. cluster 3 filled with 5.1% with sample size 15. In case of gender 100.0% male students are involved with 100.0% rural students and 100.0% science students with 58.00% 'cognitive test anxiety'. Cluster 4 made up by 6.1% with sample size 18. In case of gender 100.0% female students are involved with 100.0% urban and 100.0% arts students with 64.22% 'cognitive test anxiety'. cluster 5 filled with 3.4% with sample size 10. In case of gender 100.0% female students are involved with 100.0% urban students and 100.0% science students with 66.70% 'cognitive test anxiety'. Cluster 6 made up by 3.1% with sample size 9. In case of gender 100.0% male students are involved with 100.0% urban and 100.0% arts students with 59.00% 'cognitive test anxiety'. cluster 7 filled with 13.3% with sample size 39. In case of gender 100.0% female students are involved with 100.0% rural students and 100.0% arts students with 75.62% cognitive test anxiety. cluster 8 filled with 23.5% with sample size 69. In case of gender 100.0% female students are involved with 100.0% rural students and 100.0% arts students with 61.19% 'cognitive test anxiety'. Cluster 9 made up by 19.0% with sample size 56. In case of gender 100.0% female students are involved with 100.0% rural and 100.0% arts students with 48.18% 'cognitive test anxiety'. cluster 10 filled with 5.1% with sample size 15. In case of gender 100.0% female students are involved with 100.0% rural students and 100.0% science students with 59.53% 'cognitive test anxiety'.

Table 6 represent the overall cluster summary in high 'predictor' to low predictor. In cluster 2 gender plays a major role and residence and stream plays moderate level and CTA plays a very low importance. When the 'cluster' increase in level 3 all 'predictors' remain the same. When the level increases in 5 to 7, all 'predictors' become the high in their role. Finally, researcher found that all variables play a great role in 'cluster' formation and CTA becomes high significant when the level of 'cluster' increases.

#### **For Figure of the study**

Figure 1: 'Predictors' of Two Step 'Clusters': Represents that the Gender emerged as the very high 'predictor' of 'cluster' formation, while residence and stream were low 'predictors'. CTA is the very low 'predictor' detected by two 'clusters' formed as mentioned in Table 1.

Figure 2: 'Predictors' of Three Step 'Clusters': Represents that the Gender emerged as the very high 'predictor' of 'cluster' membership, while 'academic stream and residence' is high predictors. CTA is the very low predictor detected by three 'clusters' formed as mentioned in Table 2.

Figure 3: 'Predictor' of Five step 'Clusters': Represents the stream, gender and residence are emerged as very high 'predictors' of 'cluster' formation. CTA is the very low 'predictors' detected by five 'clusters' formed as mentioned in Table 3.

Figure 4: 'Predictors' of Seven Step 'Clusters': Represents that Gender, stream and residence were all very high 'predictors' of 'cluster' formation. CTA is the moderate 'predictor' detected by seven 'clusters' formed as mentioned in Table 4.

Figure 5: 'Predictor' of Ten Step 'Clusters': Represents that residence, gender, stream and CTA are very high 'predictors' of 'cluster' formation in Table 5.

#### **V. CONCLUSION**

The study examined cognitive test anxiety among postgraduate students by forming cluster based on gender, stream, and residence, and by analysing the importance of these predictors across different cluster sizes. The findings indicate that demographic variables, particularly gender, stream, and residence, consistently play a significant role in forming clusters. In smaller cluster solutions, these variables show stronger predictive importance, while cognitive test anxiety initially appears as a less influential factor. However, as the number of clusters increases, CTA gradually gains importance and becomes a major predictor in the ten-cluster solution. Overall, results suggests that demographic characteristics strongly influence the grouping of students, While the role of cognitive test anxiety becomes more evident when the clustering structure becomes more detailed.



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