



# COMPARISON AMONG DIFFERENT DIMENSIONS OF ORGANIZATIONAL CLIMATE OF SECONDARY SCHOOL TEACHERS OF WEST BENGAL BY MAHALANOBIS DISTANCE

**Dr. Ramkrishna Mohanta<sup>1</sup>, Prasanta Gayen<sup>2</sup>, Indranil Pal<sup>3</sup>,  
Ramesh Chandra Mahato<sup>4</sup>, Dr. Subir Sen<sup>5</sup>**

<sup>1</sup>Assistant Professor, Dishari College of Education, Burdwan, West Bengal, India

<sup>2</sup>Research Scholar, Department of Education, Sidho-Kanho-Birsha University, Purulia, W.B., India

<sup>3</sup>M.Ed. Student, Rajendra Academy for Teachers' Education, Durgapur, WB, India

<sup>4</sup>Research Scholar, Department of Education, Sidho-Kanho-Birsha University, Purulia, W.B., India

<sup>5</sup>Associate Professor, Department of Education, Sidho-Kanho-Birsha University, Purulia, W.B., India

Corresponding Author: Dr. Subir Sen

## ABSTRACT

Application of Mahalanobis Distance is of recent trend in social science research. The present work deals with the application of such to measure the difference in different dimensions of Organizational Climate like Employees' Perception of Autonomy, Trust on Manager, Team Work, Reward and Recognition, Employees' Perception towards Fairness and Employees' Perception towards Organizational Support taking together as a branch for different groups of secondary level teachers. Difference between groups of secondary level teachers for all the dependent variables taken together at a time is a matter of consideration here. Mahalanobis Distance is one of the most powerful way-out to find out the dynamical nature of group of variables. Two different dichotomous groups of teachers have been taken into consideration for this present study. Mahalanobis Distance is smeared to associate the dynamical nature of six dependent variables i.e. different dimensions of Organizational Climate like Employees' Perception of Autonomy, Trust on Manager, Team Work, Reward and Recognition, Employees' Perception towards Fairness and Employees' Perception towards Organizational Support considered as a branch. The result revealed that there is no significant difference in dynamical nature of six dependent variables for different groups of independent variables.

**KEY WORDS:** Mahalanobis Distance, Organizational Climate, Employees' Perception of Autonomy, Trust on Manager, Team Work, Reward and Recognition, Employees' Perception towards Fairness and Employees' Perception towards Organizational Support.

## INTRODUCTION

Individuals frequently go back to institutions with successful organisational climate. The culture that an institution fosters frequently brings back memories of its environment (Mohanta & Saha, 2022). The term 'organisational climate' was first coined by human relationists in the late 1940s. It is now a potent metaphor for comprehending and describing the social order (Venkatesh, n.d.). Employees' shared impressions and meaning associated with the rules, practises, and procedures they come across, as well as the behaviour they see being encouraged and supported, make up the organisational climate (Mohanta et al. 2023).

In the words of Litwin and Stringer (1968), "Organizational climate is a set of measureable properties of the work environment that is directly or indirectly perceived by the people who live and work in a particular environment and is assumed to influence their motivation and behaviour". In the context of research on racial similarity, P C Mahalanobis developed the Mahalanobis Distance (Mahalanobis, 1936; Adhikari, 2023). Various researches using Mahalanobis Distance have already been done in various fields. In the field of Education also specially in different psychological measurements and achievement analysis, Mahalanobis Distance is of recent trends. Mahalanobis Distance is also used in study by several domains, including anthropology, classification, clustering, image processing, etc. We can use a measure like the Mahalanobis Distance in the current investigation.

## LITERATURE REVIEW ON MAHALANOBIS DISTANCE

Ahmed et al. (2019) investigated the disparity in mathematics achievement for various students in various grades of higher secondary level in Assam, India focusing on the characteristics of mathematical success for two groups of higher secondary students. Sen and Pal (2020) used this distance for achievement analysis in a different investigation. Ahmed et al. (2021) also used



Mahalanobis distance to compare the academic performance of two groups of students from the Bodoland Territorial Region (BTR) in the Indian state of Assam in the subjects of physics, chemistry, biology, and mathematics. With the aid of Mahalanobis Distance, Mahato and Sen (2021) directed a study on academic stress, self-efficacy in mathematics, and anxiety in mathematics for two groups of higher secondary level students. In an article, Gorain et al. (2021) argue how social isolation is a crucial factor in the growth of the internet in the twenty-first century because of its negative effects on human personality and potential for social withdrawal. The article by Ahmed et al. (2022a) reviews a recent study that compares the academic success of two student groups in the Bodoland Territorial Region (BTR), Assam, India, across four subject areas: mathematics, English, general sciences, and social studies. The academic performance of higher secondary students in the Bodoland Territorial Region (BTR) area of Assam, India was compared by Ahmed et al. (2022b) using the Mahalanobis Distance in five different subject areas, like Mathematics, English, and other studies.

## LITERATURE REVIEW ON ORGANIZATIONAL CLIMATE

Berberoglu (2018) in his study discovered that organizational commitment and perceived organisational performance were significantly positively correlated with organisational climate. Moslehpour et al. (2018) in their study concluded that the association between leadership style and job satisfaction is mediated by organizational climate and work style. Atallah Salah & Al-Attili (2019) also found strong relationship between organizational climate such as structure of organization, use of technology, type of work of the company, communication as well as participation of the employees and the performances of the employees within the organization. A study by Beri et al. (2020) on organizational climate concluded that academic optimism and organizational climate have no significant difference in them whereas Reetu et al. (2020) in their study found that organizational climate had a strong relationship with organizational effectiveness and job satisfaction.

Present work is performed to compare the dynamical nature of different dimensions of organizational climate for different dichotomous variables like male and female, and rural and urban teachers of secondary level of West Bengal, India.

## OBJECTIVES

Objectives of this study is to compare different dimensions of Organizational Climate like Employees' Perception of Autonomy, Trust on Manager, Team Work, Reward and Recognition, Employees' Perception towards Fairness and Employees' Perception towards Organizational Support taking together as a branch for different group of secondary level teachers. And for this the objectives of the study are framed accordingly:

1. To compare the difference between male and female teachers regarding the present condition of above mentioned variables.
2. To compare the difference between teachers of urban and rural institutions regarding the present condition of above mentioned variables.

## HYPOTHESES

For the present work, following hypotheses may be taken into consideration:

H<sub>0</sub>1: There is no significant difference between male and female secondary level teachers on different dimensions of organizational climate taken together as a unit.

H<sub>0</sub>2: There is no significant difference between secondary level teachers of urban and rural institutions on different dimensions of organizational climate taken together as a unit.

## METHODOLOGY

1. **Method:** Descriptive Survey method has been applied for the current study.
2. **Population:** All the secondary level school teachers of West Bengal, India have been considered as the population of the study.
3. **Sample & Sampling Technique:** Data for the present study have been collected from 400 secondary level school teachers of West Bengal, India using Stratified Random sampling technique.
4. **Independent Variables:** Gender (Male and Female) and Location of Institution (Rural and Urban).
5. **Dependent Variables:** Different dimensions of Organizational Climate like Employees' Perception of Autonomy, Trust on Manager, Team Work, Reward and Recognition, Employees' Perception towards Fairness and Employees' Perception towards Organizational Support.

Mahalanobis Distance may be defined as

$$\Delta^2 = (A - B)^T \zeta^{-1} (A - B)$$



Where  $A$  and  $B$  are the column vectors representing means of each variable for two groups and  $\zeta$  is pooled covariance matrix of two groups of data.

$$\text{Mahalanobis Distance } \Delta = [(A - B)^T \zeta^{-1} (A - B)]^{\frac{1}{2}}$$

Pooled Covariance Matrix

$$\zeta = [N_1 \zeta_1 + N_2 \zeta_2] / N$$

Where  $\zeta_1$  and  $\zeta_2$  be the Covariance Matrices,  $N_1$  and  $N_2$  be the sample size for first and second group respectively and  $N = N_1 + N_2$ .

### RESULTS AND DISCUSSIONS

In Table 1, 2 & 3, following abbreviations are used to represent six different dimensions of Organizational Climate:

1. Autonomy= Employees' Perception of Autonomy,
2. Manager= Trust on Manager,
3. Team= Team Work,
4. Reward= Reward and Recognition,
5. Perception= Employees' Perception towards Fairness
6. Support=Employees' Perception towards Organizational Support.

Male Teachers (N=218)						
Dependent variable	Autonomy	Manager	Team	Reward	Perception	Support
Mean	33.28	30.03	33.10	41.32	40.71	36.82
Female Teachers (N=182)						
Dependent variable	Autonomy	Manager	Team	Reward	Perception	Support
Mean	33.81	29.56	33.26	41.18	40.47	36.35
Urban Teachers (N=211)						
Dependent variable	Autonomy	Manager	Team	Reward	Perception	Support
Mean	34.00	30.26	33.28	41.25	40.69	37.02
Rural Teachers (N=189)						
Dependent variable	Autonomy	Manager	Team	Reward	Perception	Support
Mean	32.99	29.32	33.04	41.26	40.49	36.14

**Table 1: Descriptive statistics for different group of teachers**

Table 1 represents the statistics required for calculating Mahalanobis Distance. We have to compare different groups to test the hypotheses  $H_01$  and  $H_02$  by calculating Mahalanobis Distance.

	Autonomy	Manager	Team	Reward	Perception	Support
Autonomy	12.04521	2.35236	2.323285	6.839566	-1.85759	3.485505
Manager	2.35236	12.05183	1.170907	1.101217	1.87434	1.520218
Team	2.323285	1.170907	8.210168	3.644959	6.344785	3.196509
Reward	6.839566	1.101217	3.644959	13.05629	1.009735	2.754116
Perception	-1.85759	1.87434	6.344785	1.009735	17.29787	2.048138
Support	3.485505	1.520218	3.196509	2.754116	2.048138	9.734327

**Table 2: Pooled variance-covariance matrix for male and female teachers**

Table 2 represents pooled variance-covariance matrix for dichotomous variable gender (male and female). And from this table both positive and negative covariances are noted.



	Autonomy	Manager	Team	Reward	Perception	Support
Autonomy	11.85712	2.053706	2.283866	6.825196	-1.93851	3.199185
Manager	2.053706	11.88774	1.095657	1.121182	1.85578	1.367752
Team	2.283866	1.095657	8.202495	3.640219	6.322733	3.124336
Reward	6.825196	1.121182	3.640219	13.06133	1.019241	2.773523
Perception	-1.93851	1.85578	6.322733	1.019241	17.30126	2.03162
Support	3.199185	1.367752	3.124336	2.773523	2.03162	9.590562

**Table 3:Pooled variance-covariance matrix for urban and ruralteachers**

Table 3 represents pooled variance-covariance matrix for dichotomous variable location of institution (urban and rural). And from this table both positive and negative covariances are noted.

Mahalanobis Distance can compare two or more variables as a unit of variables. Here the unit is employees’ perception of autonomy, trust on manager, team work, reward and recognition, employees’ perception towards fairness and employees’ perception towards organizational support. Mahalanobis Distance is represented by a number as measure of distance.If it is found that Mahalanobis Distance is greater than 1, it may be concluded that the difference between two sets of multiple variable is significant. Obviously Mahalanobis Distance may be treated as insignificant if it is less than 1.

Independent variables	Male vs Female	Urban vs Rural
Mahalanobis Distance	0.3564	0.4734

**Table 4:MD for dependant variables:Employees’ Perception of Autonomy, Trust on Manager, Team Work, Reward and Recognition, Employees’ Perception towards Fairness and Employees’ Perception towards Organizational Support**

Table 4 represents the MahalanobisDistance between dichotomous variables. Values of Mahalanobis Distance listed in table2 express that the differences are insignificant. So, there is no significant difference in dynamical nature of the dichotomous groups when six dependent variables i.e. Employees’ Perception of Autonomy, Trust on Manager, Team Work, Reward and Recognition, Employees’ Perception towards Fairness and Employees’ Perception towards Organizational Support composed as a branch. So,  $H_0$ 1 and  $H_0$ 2are failed to be rejected.

## CONCLUSION

A set of dependent variables (Employees’ Perception of Autonomy, Trust on Manager, Team Work, Reward and Recognition, Employees’ Perception towards Fairness and Employees’ Perception towards Organizational Support)is measured using Mahalanobis Distance. Response of teachers showed that no significant difference is present in different dimensions of organizational climate with reference to gender and location of the institutions.

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