Clustering Technique for Analyzing Attitude towards Value-oriented Education among Undergraduate Students

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ABSTRACT

The main purpose of this study is to compare the responses provided by the undergraduate students of Purulia District on their attitude towards value-oriented education. The study uses a two-step Cluster Analysis technique and a number of clusters are produced with the local of residence and gender of the students serving as a key predictor of the clusters. The impact of the predictors on cluster formation is also examined. Each cluster has a different formation in relation to the predictors. The result showed that, whenever the number of clusters is increased, the number of predictors also increases. It was also found that location becomes the most important predictor. Another finding of this study also revealed that the academic achievement and the score of attitude towards value-oriented education among undergraduate students are not correlated to each others.

Keywords: Undergraduate Students, Cluster Analysis, Predictors, Value, Value – oriented Education

Introduction

Education is a continuous and lifelong process by which a person can adjust to a changing environment by making a desired change in his behavior. Swami Vivekananda Said "Education is the manifestation of perfection already in men". On other side value is a kind of feeling through which a person can become aware of the norms and customs of the society and follow these norms and customs properly. Values are standards or principles considered important in life. They come from within (Love, Kindness, Compassion, Mercy, Sympathy, Empathy etc.) and also by inculcate (Punctuality, Discipline, Obedience, Behavior, Conduct, Character). Value oriented education is the education, through which values are inculcate among the students. It is possible to inculcate value among the students through real education. **Khatun, Ansary and Adhikari (2022)** said that Yoga is a medium through which students develop mentally as well as physically. The hierarchical cluster technique is used to organize these recent observations. The two-step Cluster Analysis algorithm may predetermine the number of clusters or may determine it itself. The sub clusters are sorted into the required number of cluster during the grouping phase. That serves as the foundation for the analysis. Because there are fewer sub clusters than data, it is simple to apply traditional grouping technique. The accuracy of the technique rises with the number of sub clusters. Mahalanobis Distance continues to play an important role in current research, especially in educational research. Various researchers have currently conducted various research activities using this Mahalanobis Distance. Studies like **Sen et al. (2023), Ahmed et al. (2022a), Ahmed et al. (2022b), Adhikari (2023), Mohanta et al. (2023a), Mohanta et al. (2023b), Gorain et al. (2021), Ahmed et al. (2021), Mahato and Sen (2021), Ahmed et al. (2020), Sen and Pal (2020). Saha, Sen and Adhikari (2021), Sen et al. (2023), Gorain et al. (2022), Mohanta et al. (2023), Adhikari et al. (2023),** etc. in these studies the researchers showed how to used Mahalanobis Distance in the field of educational research.

Literature Review

Review on Value-oriented Education

Zaki (2018) reported that no significant relationship was found between value orientation and psychological wellbeing of student teachers of DIETs. **Singh (2018)** explained that the higher education need to strike a balance among values while teaching different courses, otherwise individual may end up in developing one value at its extreme while missing squarely on the other values. **Khemani (2017)** find out that there are five prominent values (religious, social, democratic, knowledge and family prestige value) which have a direct impact on employee's performance. **Lartang (2014)** revealed a significant difference between first year and second year, and between rural and urban and no significant difference between male and female DIET's students teachers towards value oriented education. **Narad and Singh (2012)** revealed that different pedagogies and methodologies are to be applied for the transmission of accumulated normative values of truth, beauty and goodness to the succeeding generation for creating a noble and healthy nation.

Gayen (2023) explained that values are internalized cognitive frameworks that help people make decisions by instilling a feeling of fundamental moral standards. **Sutradhar et al. (2023)** said that value is an essence of education and is the very need of the hour, while we watch society's morality gradually deteriorate. **Ansary, Gorain and Saha (2023)** revealed that there is no significant difference existing between different demographic variables (gender, local of the students) of undergraduate students regarding their attitude towards value-oriented education.

Review on Cluster Analysis

Adhikari et al. (2023) conducted a study on multi-dimensional data analysis n education. In this study the researcher concluded that cluster analysis can be a powerful data-mining tool for any organization that needs to different groups of psychological measures. **Sen et al. (2023)** analyzed the leadership style of the head of the institutions through the use of clustering technique. The researcher revealed that whenever the number of clusters was increased, the number of predictors also increased. **Mohanta et al. (2023)** in their research work Introspecting Institutional Commitment Using Cluster Analysis attempts to study the likeness of the responses given by secondary school teachers regarding Institutional Commitment. The study uses a two-step cluster analysis technique, and various clusters are produced in relation to the gender of the teachers and the locations of the institutions. The impact of the Predictors on cluster formation is also examined. **Mohanta et al. (2023)** in their research work Perceptional Environment: A Study on Organizational Climate Using Cluster Analysis. The findings of this study showed that gender effects the conclusions about the institutional atmosphere. **Gorain et al. (2022)** in their research paper A Study on Relationship and Cluster Analysis among Internet Dependency, Social Isolation and Personality. Despite the weak and unreliable relationships between these elements, three clusters are produced. In order to achieve the aforementioned objectives, correlations between Internet Dependency, Social Isolation, and five distinct personality factors are looked into for art, science, and all art and science learners. Male and female students in the arts formed two distinct clusters, whereas science students formed a single cluster. **Saha et al. (2021)** in their research paper analysis of attitude towards yoga among college students using clustering techniques discuss views regarding yoga practice and examined among college students in the Purulia, India. To conduct the research, a two-step cluster analysis is used to establish five clusters. **Adhikari and Sen (2023)** conclude that with the increase in the number of the clusters the importance of the predictors also changes. **Adhikari, et al. (2023)** concluded that for a specific collection of experimental data or real-world research, statistic is a type of mathematical analysis that makes use of quantified models, representation, and synopses.

Review related to Co-relation

Saha (2012) found that creativity is positively correlated with socio-economic status. **Saha (2013)** have selected randomly 300 secondary students of Birbhum District in West Bengal. **Kundu, Saha and Mondal (2015)** showed significant relationship between social intelligence and adjustment of U.G. level students. **Naik, Dutta and Sutradhar (2015)** revealed negative relationship between mental health and Facebook addiction. **Karmakar et al. (2016)** have revealed significant relationship between IQ and height; and low significant relationship between IQ and weight; and also, no significant relationship between IQ and BMI. **Kar, Saha and Mondal (2016)** found that Emotional Intelligence affects home, school and peer adjustment through Pearson coefficient correlation. **Gorain et al. (2018)** revealed that while there is no discernible difference in internet usage between humanities and science graduate students, high internet users are more socially isolated than ordinary and low internet users. **Mondal et al. (2018)** revealed that neuroticism is highly correlated with internet affinity, whereas the other four personality factors are either negatively correlated with internet affinity or are not correlated at all, and that males have a higher internet affinity than their female counterparts. **Kar and Saha (2021a)** showed significant relationship between emotional intelligence and leadership style of undergraduate students of West Bengal. **Sutradhar and Sen (2022a)** revealed that emotional maturity and its dimensions have a significant effect on academic achievement of B.Ed. trainees. **Gayen and Sen (2021)** found significant relationship between anxiety and depression. **Kar and Saha (2021b)** revealed significant relationship between Adjustment Ability and Leadership style of undergraduate students of West Bengal. **Sutradhar and Sen (2022b)** found significant relationship between emotional maturity and study habits. **Gorain et al. (2022)** found positive relationship between Internet Dependency and Social Isolation. **Mahato and Sen (2023)** investigated the relationship among three variables Contexts Knowledge (CK1), Technological Pedagogical Content Knowledge (TPCK) and Attitude towards Creative Teaching (ACT) considering two variables at a time and found significant relationship in most of the cases. **Ansary, Saha and Gorain (2021)** showed that gender is not a determining factor for achievement motivation of the students. **Mahato, Gayen and Mahato (2023a)** revealed that there is no correlation between undergraduate students in the Purulia area of West Bengal's self-efficacy and m-learning. **Mahato, Gayen and Mahato (2023b)** revealed a significant relationship of internet addiction between boys and girls, but no difference has been found in academic resilience. Locality has no discernible influence on either academic toughness or internet addiction. **Mahato, Gayen and Mahato (2023c)** have explored a substantial association between cognitive failure and internet addiction among pupils in West Bengal's higher secondary Purulia area. However, no substantial differences in cognitive failure and internet addiction have been reported in terms of gender, region, or stream. **Ansary (2023)** said that an individual's social attitude is their attitude towards other people or things in society.

Methodology

Method: Descriptive survey method is used in this research work.

Sample: To undertake the research work a sample of 149 undergraduate students were taken.

Sampling procedure: Stratified random sampling has been employed by the investigators to collect responses from the respondents.

Statistical techniques used: Product moment method is applied to calculate the Coefficient of Correlation in the research work. In order to classify the total sample into different cluster, two step clustering technique is used in the research work.

Result and Discussion

Table 1: Coefficient of Correlation between the score of value-oriented education and academic achievement

Correlations			
		Value	Academic Achievement
Score of Attitude towards value-oriented Education	Pearson Correlation	1	.051
	Sig. (2-tailed)		.539
	N	149	149
Academic Achievement	Pearson Correlation	.051	1
	Sig. (2-tailed)	.539	
	N	149	149

Table 1, it was depicts that the coefficient of correlation between the score of value-oriented education and academic achievement is 0.051 which is not significant at 0.01 and 0.05 levels of significance. It indicates that adjustment ability and achievement motivation of higher secondary school students are not correlated with each other.

Clusters

Input (Predictor) Importance
☐ 1.0 ☐ 0.8 ☐ 0.6 ☐ 0.4 ☐ 0.2 ☐ 0.0
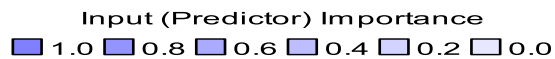
Cluster	1	2
Label		
Description		
Size	60.4% (90)	39.6% (59)
Inputs	Location Rural (100.0%)	Location Urban (100.0%)
	Marks 352.00	Marks 277.81
	Gender Female (63.3%)	Gender Male (52.5%)
	Value 248.07	Value 250.73

Table 2: Formation of 2 Clusters

Predictor Importance

Least Important   Most Important
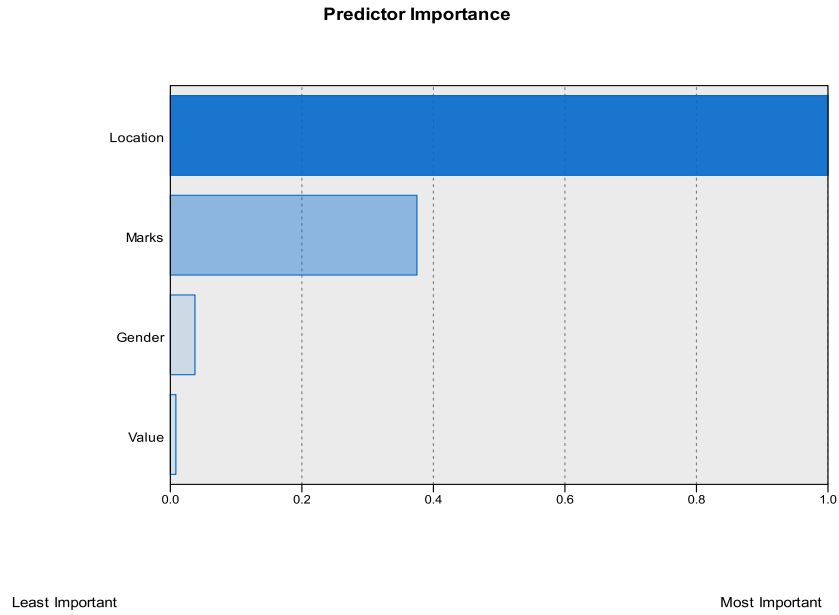
Figure 1: Predictor importance for the clusters described in Table 2

Table 2, represent the clusters formed by undergraduate students in which cluster 1 is the largest cluster consisting of rural areas students (100%), dominated by female undergraduate students (63.3%) and is (60.4%) of the total sample size. Cluster 2 dominated by male undergraduate students (52.5%) and made up of 39.6% of total sample size, consisting of urban institutions (100%). From figure 1 it is clear that location is major predictor of the cluster, where academic achievement (label as Marks in tables and figures)) is low predictor and score of value-oriented education and gender are very low predictors of the clusters mentioned in Table 2.

Clusters

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

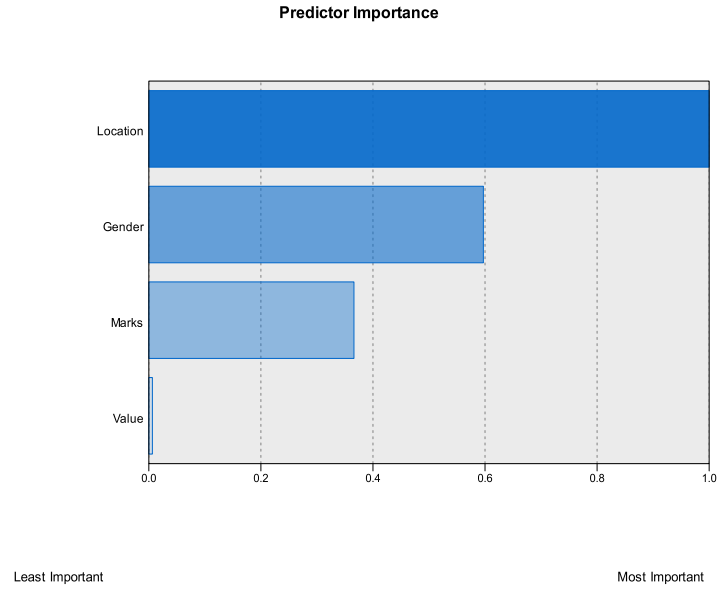| Cluster	2	3	1
Label			
Description			
Size	39.6% (59)	38.3% (57)	22.1% (33)
Inputs	Gender Male (52.5%)	Gender Female (100.0%)	Gender Male (100.0%)
	Location Urban (100.0%)	Location Rural (100.0%)	Location Rural (100.0%)
	Marks 277.81	Marks 357.02	Marks 343.33
	Value 250.73	Value 246.61	Value 250.58

Table 3: Formation of 3 clusters

Figure 2: Predictor importance for the clusters described in Table 3

Table 3 represents the clusters formed by undergraduate college students in which cluster 2 is the largest cluster with urban undergraduate students (100%), consisting of male students (52.5%) and is (39.6%) of the total sample size. Cluster 3 formed bymale (100%) and cluster 1 male (100%) consist of 38.3% and 22.1% of total sample size. Cluster 1 is the smallest cluster with rural undergraduate students (100%), consisting of male students (100%) and is (22.1%) of the total sample size. From Figure 2 it is clear that location and gender are major predictors of the clusters, where academic achievement is low predictors of the clusters mentioned in Table 3. There was no influence of value oriented education for formation of clusters.

Table 4: Formation of 4 clusters

Predictor Importance

Least Important   Most Important
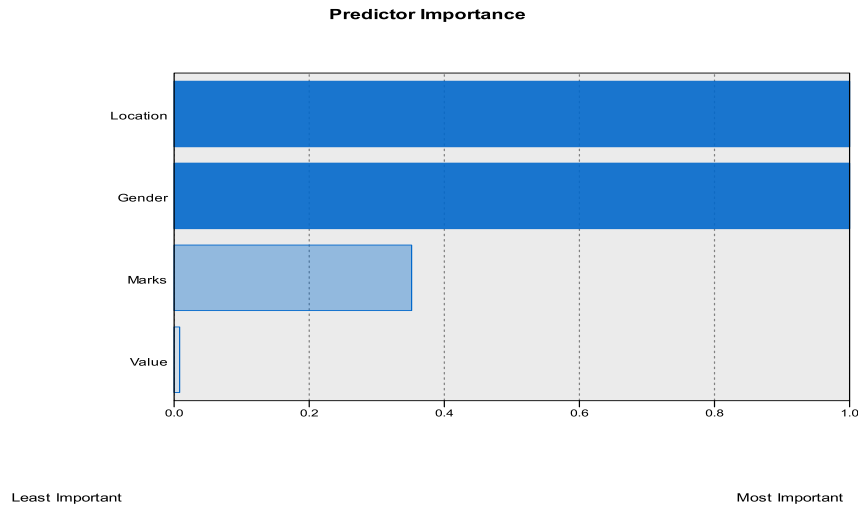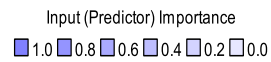
Figure 3: Predictor importance for the clusters described in Table 4

Table 4 represent the clusters formed by undergraduate students in which cluster 4 is the largest cluster consisting of rural undergraduate students (100%) of female students (100%) and is 38.3% of the total sample size. Cluster 1 (rural 100%) and cluster 2 (urban 100%) consist of 22.1% and 20.8% of total sample size respectively with male students (100%) male (100%) for each cluster. Cluster 3 (urban 100%) is the smallest cluster consisting of 18.8% of the total sample size with female (100%) undergraduate students. From figure 3 it is clear that location and gender are high predictors where, academic achievement is low predictor and score of value-oriented education is negligible predictor of the clusters mentioned in Table 4.

Clusters

Input (Predictor) Importance

■1.0 ■0.8 ■0.6 □0.4 □0.2 □0.0

Cluster	1	5	2	3	4
Label					
Description					
Size	22.1% (33)	21.5% (32)	20.8% (31)	18.8% (28)	16.8% (25)
Inputs	Gender Male (100.0%)	Gender Female (100.0%)	Gender Male (100.0%)	Gender Female (100.0%)	Gender Female (100.0%)
	Location Rural (100.0%)	Location Rural (100.0%)	Location Urban (100.0%)	Location Urban (100.0%)	Location Rural (100.0%)
	Marks 343.33	Marks 359.56	Marks 277.94	Marks 277.68	Marks 353.76
	Value 250.58	Value 230.19	Value 254.00	Value 247.11	Value 267.64

Table 5: Formation of 5 clusters
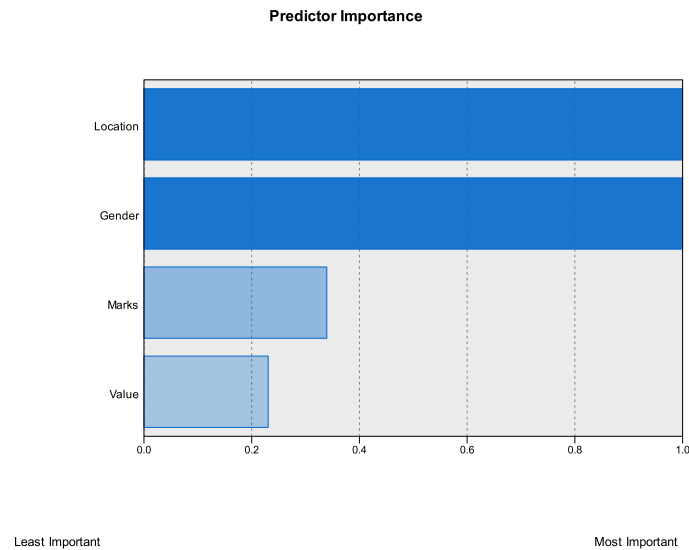
Predictor Importance

Figure 4: Predictor importance for the clusters described in Table 5

Table 5 represent the clusters formed by undergraduate students in which cluster 1 is the largest cluster consisting of rural areas undergraduate students (100%) of male students (100%) and is 22.1% of the total sample size. Cluster 5 is the second largest cluster consisting of rural (100%) of female students (100%) and is 21.5% of total sample size. Cluster 2 (male 100%) consist of urban (100%) with sample size 20.8% of total sample size. Cluster 3 (female 100%) consist of urban (100%) with sample size 18.8% of total sample size. Cluster 4 (female 100%) consist of rural (100%) with sample size 16.8% of total sample size. From figure 4 it is clear that location and gender are high predictors where, academic achievement and score of value-oriented education are low predictors respectively of the clusters mentioned in Table 5.

Conclusion

The finding of this study revealed that the academic achievement and the score of attitudes towards value-oriented education among undergraduate students are not correlated to each other. From the above analysis it was also found that when there are two clusters, location is the only important predictor of the clusters. With increase of one more cluster, gender and location become two important predictors but when the number of cluster are increased four or five then predictors like gender and location become important predictors. Therefore, to summarize, whenever the number of clusters are increased, the number of predictors also increase. It was also found that location becomes the most important predictor.

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