Validating the University Climate Questionnaire

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ABSTRACT

This research paper defines and refers to the validation of a various dimensions of university climate, the University Climate Measure (UCM), based upon Malcolm G. Patterson, et al, (2005). A sample of 200 university teachers from the government and private universities of Lucknow, U.P., India, was surveyed to collect the primary data. 20 Items which were finally selected belonged to following dimensions:

- *Autonomy & Integration,*
- *Involvement in decision making & Management Support,*
- *Formalization & Tradition and*
- *Performance Feedback, Pressure to Produce & Quality,*

All these dimensions had acceptable levels of reliability and were ultimately selected.

Keywords: *University, University Climate, Teachers, Reliability & Validity.*

1. INTRODUCTION & LITERATURE REVIEW

The organizational climate or in this case the University climate is generally a term which is very often taken into account while ascertaining the overall atmosphere or feel of the particular educational institute. The Academicians have time again stressed upon the importance of a good and congenial university climate, which ultimately helps in creating a positive atmosphere for the growth of the institute and the system of education. The role of University Climate widely helps in procuring new talent as well as retaining the old ones. This is very crucial in terms of human resources and future growth of the educational institute.

Review of the literature in organisational climate reveals that Organisational Climate has significant and positive relationship with organisational commitment (Turon 1988) and students' scholastic achievement (Varshveya 1981, Suman Lata 2005). Educational institutions differ in their climate (Ahluwalia 1990) and it is found that climate has positive correlation with job satisfaction (Park 2001, Mishra 2005). Teachers, who perceive the institutional climate as autonomous and closed, show lesser teaching effectiveness (Sodhi Binakshi 2012). Effectiveness of the Teaching depends on the type of school climate (Riti 2012). Hence, it is clear that there is relationship between institute's climate in deciding effectiveness of the teaching as well as total efficiency of the institution.

Gupta M., Goel R., (2014), A significant difference was found in the organisational climates of residential and nonresidential schools. Organisational climate of residential schools was found to be better than nonresidential schools.

- There was a significant difference in the levels of disengagement and alienation in residential and nonresidential schools. More disengagement and alienation were found in organizational climate of nonresidential schools.

- There was no significant difference in esprit and intimacy levels in organizational climates of residential and nonresidential schools.

- There was a significant difference in psycho-physical hindrance, controls, production emphasis and humanized thrust in organisational climates of residential and nonresidential schools. Level of these four aspects was found to be more in organizational climates of residential schools.

Organizational climates in higher education institutions are very different from the organizational climates in other areas of business and industry. Thus, studies of the relationship between organizational climate and job satisfaction conducted in a setting other than an educational institution will not be very revealing in considering the nature of the relationship for college and university faculty. Indeed, the focus on teaching, learning, and student outcomes in higher educational institutions is very different from the focus on fiduciary concerns present in business and industry (Deas, 1994; Evans & Honeyman, 1998).

Research Objective: To identify the factors responsible for determining the University Climate in Lucknow, capital city of U.P., India.

2.0 RESEARCH METHODOLOGY & VALIDATION

2.1. Development of Research Constructs

For the purpose of study, several measures of university climate, were taken into account, after due discussion with research guide, academicians, and expert professors and literature survey.

2.2. Questionnaire Development and Administration

A well-structured questionnaire was developed after an extensive review of literature and the exploratory investigations. As this research study is for university teachers, a final questionnaire was developed to conduct the pilot study on the respondents.

2.3. Questionnaire had several parts-

- First Part consisted of questions related to the Demographic information of the respondents.
- Second part consisted of questions about the **University Climate.**

Respondents were asked to indicate their attitudinal response on several statements on **university climate** on a LIKERT scale based questions. There were five choices namely, **Strongly Disagree (1),**

Disagree (2), Undecided (neither agree nor disagree) (3), Agree (4), and Strongly Agree (5).

The questionnaire was developed in English and then reviewed by experts. During the survey, researcher used questionnaire and schedule survey methods. A schedule is generally filled by the research worker, who can interpret the questions when necessary. Non response is very low because this is filled by enumerators who are able to get answers to all questions. The information collected is generally complete and accurate as enumerators can remove difficulties if any faced by respondents in correctly understanding the questions or related to language. As a result the information collected through schedule is relatively more accurate than that obtained through questionnaires.

2.4. Questionnaire Design

A close-ended structured questionnaire was used for the benefit of data analysis. As mentioned previously, questionnaire items were developed from related research and appropriately adapted.

Questionnaires contain close ended **dichotomous and multiple choice questions** especially for collecting demographic information. Questionnaire is mainly dominated by **5 point LIKERT scale** based questions, as it was meant to measure relationship among university climate and satisfaction of university teachers.

A rating scale was constructed to study **independent variables**, which are in the form of various factors supposed to be affecting teachers' satisfaction:

2.5. Validity

Validity is the extent to which a test measures what it claims to measure. It is vital for a test to be valid in order for the results to be accurately applied and interpreted.

The face validity of the rating scale was obtained. **Face validity** is a property of a test intended to measure something. It is the validity of a test at face value. In other words, a test can be said to have face validity if it "looks like" it is going to measure what it is supposed to measure. For instance, if one prepares a test to measure whether students can perform multiplication and the people you show it to all agree that it looks like a good test of multiplication ability; one has shown the face validity of one's test.

Thus the rating scale was finalized for the proposed research. This is a Five Point Likert Scale having five category of responses viz.: 5=*strongly agree*, 4=*agree*, 3=*neutral/undecided*, 2=*disagree*, 1=*strongly disagree*. Scoring for the scale is: Using scale value of 5 to 1 for a positive statement and 1 to 5 for a negative one.

2.6. Construction of Rating scale:

Rating Scale to study the University Climate has been constructed for data collection.

- For the research purpose, first 19 independent variables were included for assessing the University Climate from the perspective of university teachers. These factors expected to be affecting the University Climate, had been identified. For measuring the university climate, **19 questions** (variables) were included.

2.7. Framing of Items: Keeping in view the objectives of the study and the focus area of the each factor affecting teachers' retention items were framed for the tool construction.

The first blueprint of the rating scale was prepared with 87 statements. Then after due discussion with experts and academicians only 50 questions were finally kept in the questionnaire for the first pilot study.

2.8. Editing of the first Blueprint:

The first blueprint of the rating scale was handed over to the experts of the field and their suggestions were sought on the following aspects:

- Language of the statements
- Relevance of the items in context to concerned factors
- Relevance to be categorised under heading- more relevant, average & least relevant.
- Sequence of the items
- Is there any item in any factor which is overlapping to any other factor?
- Is the tool measuring what is meant to measure?

After receiving each one's suggestions and comparison of the suggestions given by each of the expert 50 items were selected for the rating scale that was prepared for the try out.

- The basis of the rejection of items, before preparing rating scale, for try-out has been following:
- Those items which have been mentioned least relevant by each expert. These were around 20 items.
- Then those items have been rejected which have been mentioned least relevant by majority of the experts. These were around 14 items.
- Then 3 items have been rejected on the basis of being having overlapping content.

Total 37 items were rejected.

2.9. First Pilot Study

First pilot study was conducted with a sample size of 50 respondents (university teachers including assistant professors, associate professors & professors), to clarify the overall structure of the final questionnaires. The respondents were assistant professors, associate professors & professors of the government and private universities situated in Lucknow, U.P., India. Then questionnaires were given to the respondents and these

respondents were chosen through personal contacts and **convenience sampling method.**

2.10. Item Analysis

Item analysis is a statistical method which is used for selecting items for inclusion in a psychological test. An item is a statement in the form of a question. For the Item analysis of the University Climate Questionnaire the researcher followed the following procedure:-

2.10.1. Reliability of the data

Table: 1 Reliability Statistics

	Reliability Statistics	
	Cronbach's Alpha	**N of Items**
ENTIRE DATA	.693	59
UNIVERSITY CLIMATE	.581	50

Factor analysis was applied to reduce the total number of items and keep the most important factors and increase the reliability of the data.

In the table of total variance explained, output lists the eigen values associated with each linear component (factor) before extraction, after extraction and after rotation. Before extraction, Output has identified **50** linear components within the data set (we know that there should be as many eigenvectors as there are variables and so there will be as many factors as variables). The Eigen values associated with each factor represent the variance explained by that particular linear component and output also displays the Eigen value in terms of the percentage of variance explained. Before rotation, some factors accounted for considerably more variance, and some factors accounted for considerably less variance. It should be clear that the first few factors explain relatively large amounts of variance (especially factor 1) whereas subsequent factors explain only small amounts of variance. **Then all factors with Eigen values greater than 1 are extracted**, which leaves us with **nine factors**. According to Kaiser Criterion, only first **9 factors** should be used because subsequent eigenvalues are less than 1.

But after extraction and rotation, The **3** factors explain the following percentage of total variance. **So, factor 1 explains 28.550% of total variance, factor 2 explains 22.525% of total variance & factor 3 explains 15.168% of total variance.** We find out that from the total 50 components (play role in determining university climate), 3 factors are extracted and these 3 factors together account for around **76%** of the total variance (Information contained in original 19 variables) hence we have reduced the number of variable from 50 to 3 underlying factors. So, around **24%** of the total variation or Information is sacrificed.

And these 3 factors included 25 items of university climate.

Researcher finally included only aforementioned 25 questions of **University Climate** in the final

questionnaire for the **second phase of the Pilot Study.**

2.11. Final Pilot Study

A pilot study was conducted with a sample size of 200 respondents (university teachers including assistant professors, associate professors & professors), to clarify the overall structure of the final questionnaires. The respondents were assistant professors, associate professors & professors of the government and private universities situated in Lucknow, U.P., India. Questionnaire for the pilot study was developed after reliability test and factor analysis and only 25 items related to university climate were kept in the questionnaire. Then questionnaires were given to the respondents and these respondents were chosen through personal contacts and **convenience sampling method.**

2.12. Reliability data analysis

According to Hair, Andersson, Tatham, Black and William (1998), the purpose of the reliability analysis is to determine whether data are trustworthy or not. Testing reliability is to measure consistency in the data that is defined as "an assessment of the degree of consistency between multiple measurements of a variable". A commonly accepted type of measuring reliability is internal consistency, which applies to consistency between the variables in a summated scale. The concept for internal consistency is that individual items or indicators of the scale should all be measuring the same construct and thus be highly correlated. Furthermore Hair *et al.* (1998) suggest that a series of diagnostic measures are to be used to assess internal consistency:

Inter-item correlation (correlation should exceed 0.30), which measure correlation among items. Another method is item to total correlation (correlation should exceed 0.40), that measures the correlation of items to the summated scale score. Both these measures are relating to each separate item.

Reliability investigation through Cronbach's Alpha is a method that is frequently used for assessing the consistency of entire scale. Due to its heavy usage, it is generally agreed that Cronbach's Alpha should exceed 0.60 to have reliability.

Table: 2 Reliability Statistics

	Reliability Statistics	
	Cronbach's Alpha	**N of Items**
ENTIRE DATA	.893	34
UNIVERSITY CLIMATE	.881	25

3.0 DATA ANALYSIS & INTERPRETATION

3.1. Factor Analysis: University Climate and its determinants.

Research Objective: To identify the factors responsible for determining the University Climate in Lucknow, capital city of U.P., India.

Factor Analysis was performed to determine the Factors which decide the University Climate and its determinants of the government and private universities in Lucknow, capital city of U.P., India.

Table: 3 KMO and Bartlett's Test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.765
Bartlett's Test of Sphericity	Approx. Chi-Square	3308.803
	Df	300
	Sig.	.000

Adequacy of the data is tested and the KMO measure of sampling adequacy is **0.765**, which indicates the present data is suitable for factor analysis. Similarly, Bartlett's test of sphericity was significant ($p < 0.001$); that explains existence of sufficient correlation between variables to proceed with the analysis.

Table: 4 Total Variance Explained

Total Variance Explained									
Compo nent	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulat ive %	Total	% of Variance	Cumulat ive %	Total	% of Variance	Cumulat ive %
1	7.198	28.794	28.794	7.198	28.794	28.794	4.114	16.457	16.457
2	3.895	15.579	44.373	3.895	15.579	44.373	3.106	12.422	28.879
3	2.292	9.168	53.541	2.292	9.168	53.541	2.919	11.677	40.556
4	1.415	5.659	59.200	1.415	5.659	59.200	2.492	9.967	50.523
5	1.260	5.040	64.240	1.260	5.040	64.240	2.393	9.573	60.095
6	1.236	4.945	69.185	1.236	4.945	69.185	1.883	7.530	67.626
7	1.043	4.174	73.358	1.043	4.174	73.358	1.433	5.733	73.358
8	.877	3.507	76.865						
9	.787	3.150	80.015						

10	.663	2.653	82.668						
11	.623	2.492	85.160						
12	.518	2.072	87.231						
13	.485	1.939	89.170						
14	.456	1.825	90.995						
15	.421	1.686	92.681						
16	.359	1.437	94.118						
17	.309	1.237	95.356						
18	.210	.840	96.196						
19	.200	.801	96.996						
20	.188	.750	97.747						
21	.153	.611	98.358						
22	.123	.493	98.851						
23	.115	.458	99.309						
24	.108	.431	99.740						
25	.065	.260	100.000						
Extraction Method: Principal Component Analysis.									

In table-4, this output lists the eigen values associated with each linear component (factor) before extraction, after extraction and after rotation. Before extraction, Output has identified **25** linear components within the data set (we know that there should be as many eigenvectors as there are variables and so there will be as many factors as variables). The Eigen values associated with each factor represent the variance explained by that particular linear component and output also displays the Eigen value in terms of the percentage of variance explained. Before rotation, some factors accounted for considerably more variance, and some factors accounted for considerably less variance. It should be clear that the first few factors explain relatively large amounts of variance (especially factor 1) whereas subsequent factors explain only small amounts of variance. **Then all factors with Eigen values greater than 1 are extracted**, which leaves us with **seven factors**. According to Kaiser Criterion, only first **7 factors** should be used because subsequent eigenvalues are less than 1.

But after extraction and rotation, all the **7** factors explain the following percentage of total variance.

So, factor 1 explains 28.794% of total variance, factor 2 explains 15.579% of total variance, factor 3 explains 9.168% of total variance, & factor 4 explains 5.659% of total variance, factor 5 explains 5.040% of total variance, factor 6 explains 4.945% of total variance & factor 7 explains 4.174% of total variance.

As evident from the **table-4.1.2.** (Total Variations Explained) we find out that from the total 25 components

(play role in determining university climate), 7 factors are extracted and these 7 factors together account for only **73.358%** of the total variance (Information contained in original 25 variables) hence we have reduced the number of variable from 25 to 7 underlying factors. So, around **26.642 %** of the total variation or Information is sacrificed.

Figure: 1 Cartell's Scree test
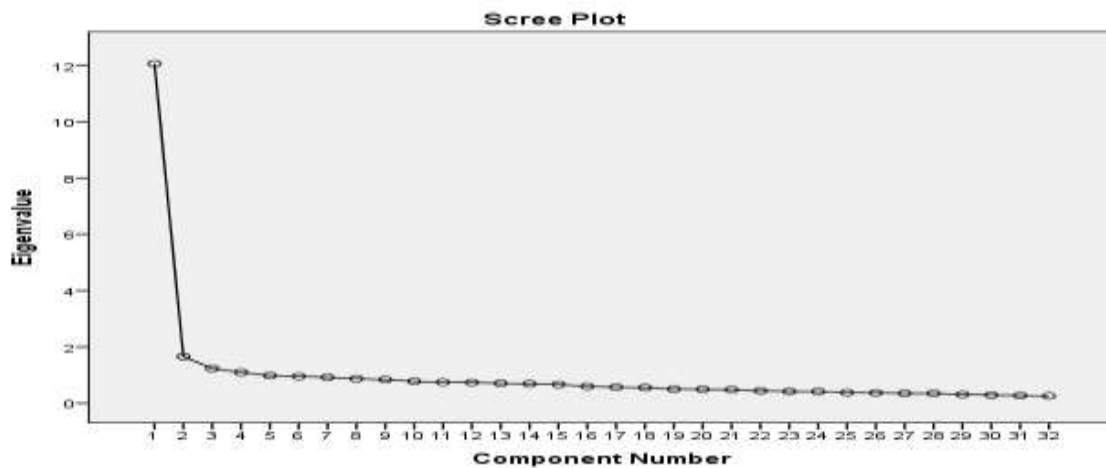
Cartell's Scree test (**Figure-4.1**) involves plotting each of the eigenvalues of the factors and inspecting the plot to find a point at which the shape of the curve changes direction and becomes horizontal. This test recommends retaining all factors above the elbow or break in the plot as these factors contribute the most to the explanation of the variance of the data set.

Usually the number of factors can also be extracted using the scree plot yet such a decision may be rather subjective. The analysis also showed that 7 factors may be obtained, as the line afterwards was almost straight. After careful examination researcher decided to obtain 7 factors as they produce the most meaningful solution.

Table: 5 Rotated Component Matrix

Rotated Component Matrix[a]							
	Component						
	1	2	3	4	5	6	7
Teachers believe the university's success depends on high-quality work.	.864						
Quality is taken very seriously here.	.759						
This university does not have much of a reputation for top-quality on national or international level.	.759						

Teachers' performance is measured on a regular basis.	.735					
Management/Administration trust people to take work-related decisions without getting permission first.	.693					
Teachers usually receive feedback on the quality of work they have done.		.862				
There are regular discussions as to whether people in the university are working effectively together.		.856				
Teachers are prepared to make a special effort to do a good job.		.853				
Ways of improving service to the students are not given much thought.		.547				
People in different departments are prepared to share information.			.862			
Collaboration between departments is very effective.			.849			
Management/Administration is responsive and reliable and can be relied upon for guidance.			.777			
Management/Administration keep too tight a reign on the way things are done around here.			.524			
This university is continually looking for new opportunities to be the best.				.820		
Students' needs are not considered top priority here.				.697		
There is very little conflict between departments here.				.571		
In this university, the way teachers work together is readily changed in order to improve performance.				.562		
It's important to check things first with the boss before taking a decision.					.755	
Management/Administration involve people when decisions are made that affect them.					.729	

Management/Administration gets too upset if teachers break the rules around here.					.719		
Management/Administration is understanding and empathetic.						.751	
Management/Administration is supportive and easy to approach.						.650	
This University is quite inward looking; it is not concerned with what is happening in the other universities.						.516	
Management/Administration is very much concerned for the proper training and development of the teachers.						.486	
This University cares about its employees.							.760
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.[a]							
a. Rotation converged in 10 iterations.							

4. FINDINGS and FINAL VALIDATION of the items of University Climate: Factors determining University Climate

In the present study Factor Analysis exhibits the rotated factor loading for the statements (Variables) of **University Climate** in Lucknow, U.P., India. Looking at table of Rotated Component Matrix, we find out that-

Factor/Component 1 contains the 5 items-

1. Teachers believe the university's success depends on high-quality work.
2. Quality is taken very seriously here.
3. This university does not have much of a reputation for top-quality on national or international level.
4. Teachers' performance is measured on a regular basis.
5. Management/Administration trust people to take work-related decisions without getting permission first.

Factor/Component 2 contains the 4 items-

1. Teachers usually receive feedback on the quality of work they have done.
2. There are regular discussions as to whether people in the university are working effectively together.
3. Teachers are prepared to make a special effort to do a good job.
4. Ways of improving service to the students are not given much thought.

Factor/Component 3 contains the 4 items-

1. People in different departments are prepared to share information.
2. Collaboration between departments is very effective.
3. Management/Administration is responsive and reliable and can be relied upon for guidance.
4. Management/Administration keep too tight a reign on the way things are done around here.

Factor/Component 4 contains the 4 items-

1. This university is continually looking for new opportunities to be the best.
2. Students' needs are not considered top priority here.
3. There is very little conflict between departments here.
4. In this university, the way teachers work together is readily changed in order to improve performance.

Factor/Component 5 contains the 3 items-

1. It's important to check things first with the boss before taking a decision.
2. Management/Administration involve people when decisions are made that affect them.
3. Management/Administration gets too upset if teachers break the rules around here.

Factor/Component 6 contains the 4 items-

1. Management/Administration is understanding and empathetic.
2. Management/Administration is supportive and easy to approach.
3. This University is quite inward looking; it is not concerned with what is happening in the other universities.
4. Management/Administration is very much concerned for the proper training and development of the teachers.

Factor/Component 7 contains the 1 item-

1. This University cares about its employees.

Hence, we can say that our **Research Objective** is fulfilled.

5. CONCLUSION:

A major contribution of this study is to identify the factors that determine **University Climate** in U.P.,

India. Results of factor analysis have produced aforementioned factors, which can be considered as most important factors of **determining university climate**.

Factor 1 to 5 have been accepted but **Factor 6 and factor 7** are not taken into account as they are explaining a very small amount of variance. Only following 20 items are included in the final questionnaire for measuring University Climate.

Human Relations Autonomy
Autonomy & Integration
1. Management/Administration trusts people to take work-related decisions without getting permission first.
2. Management/Administration keeps too tight a reign on the way things are done around here.
3. It's important to check things first with the boss before taking a decision.
4. There is very little conflict between departments here.
5. People in different departments are prepared to share information.
6. Collaboration between departments is very effective.
Involvement in decision making & Management Support
7. Management/Administration involves people when decisions are made that affect them.
8. Management/Administration is responsive and reliable and can be relied upon for guidance.
Internal Process
Formalization & Tradition
9. Management/Administration gets too upset if teachers break the rules around here.
10. Ways of improving service to the students are not given much thought.
11. Students' needs are not considered top priority here.
12. This university is continually looking for new opportunities to be the best.
13. In this university, the way teachers work together is readily changed in order to improve performance.
14. There are regular discussions as to whether people in the organization are working effectively together.
Rational Goal

Clarity of Organizational Goals, Efficiency and Effort
15. Teachers are prepared to make a special effort to do a good job.
Performance Feedback, Pressure to Produce & Quality
16. Teachers usually receive feedback on the quality of work they have done.
17. Teachers' performance is measured on a regular basis.
18. Quality is taken very seriously here.
19. Teachers believe the university's success depends on high-quality work.
20. This university does not have much of a reputation for top-quality on national or international level.

These aforementioned 20 items belong to five dimensions of University Climate as described by Malcolm G. Patterson, et al., (2005).

Human Relations Autonomy

Dimension-1: Autonomy & Integration

Dimension-2: Involvement in decision making & Management Support

Internal Process

Dimension-3: Formalization & Tradition

Rational Goal

Dimension-4: Clarity of Organizational Goals, Efficiency and Effort

Dimension-5: Performance Feedback, Pressure to Produce & Quality

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