Predictive Analytics on Contractual Faculty Future Retention Rate in Rural Areas of India with the help of Clinical Stress cum Retention Rate Model

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Subject Area: Management Science. Type of the Paper: Analytical Research. Type of Review: Peer Reviewed as per <u>[C|O|P|E]</u> guidance. Indexed In: OpenAIRE. DOI: <u>https://doi.org/10.5281/zenodo.6546970</u> Google Scholar Citation: <u>IJAEML</u>

How to Cite this Paper:

Mahajan, Vishal, & Aithal, P. S., (2022). Predictive Analytics on Contractual Faculty Future Retention Rate in Rural Areas of India with the help of Clinical Stress cum Retention Rate Model. *International Journal of Applied Engineering and Management Letters (IJAEML)*, 6(1), 267-279. DOI: <u>https://doi.org/10.5281/zenodo.6546970</u>

International Journal of Applied Engineering and Management Letters (IJAEML) A Refereed International Journal of Srinivas University, India.

Crossref DOI : https://doi.org/10.47992/IJAEML.2581.7000.0136

Received on: 04/04/2022 Published on: 16/05/2022

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ABSTRACT

Purpose: Predictive Analytics study has been conducted on contractual faculty working in various engineering and management colleges in the border area of Gurdaspur, Punjab to find the retention rate of these faculty members against the various personnel policies adopted by these institutions.

Objective: Stress is described as a state of physiological unevenness. Albeit contemporary education sector in an eminent country such as India where regular jobs become penurious obsolete perhaps people still accord in this sector because of their interest in the teaching. On the contrary, most of the new faculty work on contract basis and their jobs are not secured or may be secured for a few months depending upon the contract period. A repercussion of this probe, the purpose of the exploration is to review job satisfaction level and their retention rate.

Design/Methodology/Approach: Study has been conducted with the help of non-probability convenient sampling by distributing questionnaires and conducting interviews on 150 faculty members working on a contract basis in government and private engineering and management colleges surrounding near an area of Gurdaspur district of Punjab, India.

Findings/Result: Personnel policies, faculty development, career growth, research support and work culture, all these parameters should clearly have considered by the administration of the engineering and management colleges of district Gurdaspur, Punjab during making any policies for the contact faculty in the future so that their satisfaction level and retention rate won't be affected.

Research limitations/implications: Research has been conducted in Gurdaspur district of Punjab. Findings may vary from other geographical area of country. Study only covers faculty members; non-teaching faculty has not been covered in this study. Time constraint is another factor for the limiting sample size.

Originality/New knowledge/Interpretation/Value: Paradoxical to previous studies, this study also tests out the connection between anxiety feeling with job security of contract faculty dwelling in engineering colleges of Punjab, India with the aid of a stress model to assess the future of teaching in rural areas.

Paper Type: Analytical Research paper

Keywords: Anxiety, Stress, Satisfaction, Occupation, Contract Teachers, Punjab.

1. PREAMBLE :

In India education job is a respective job. Although in the present scenario there are hardly any permanent jobs in this sector, now contract system in education become reality in our country. However, in India most of the colleges and universities are equipped with newly joined contract faculty and they are relieved from their jobs when their contract period is over, they have to go for same recruitment procedure every year or some time twice a year. May be universities or colleges adopted these procedures to meet up the increasing cost of the expenditure they incurred for infrastructure and regular faculty salaries. Rather nobody thinking about these contract faculty



members and their stress which they receive from their jobs. In our country there is requirement to work on this system to save the future of the education.

2. RETROSPECT OF LITERATURE :

Anton et al (2016) [1] found that learning is required in higher education for finding the reasons for faculty resistance. Anna et al (2018) [2] explores that there is lack of confidence in teachers due to lack of international language exposure. Bourdon et al (2007) [3] investigates that shortage of teachers and contract system has significant impact on education system in Africa. Chaudhury et al (2006) [4] explains about the absent problem of teachers in primary schools of Bangladesh, India, Ecuador, Peru and Uganda. Darling et al (2016) [5] finds out that the qualified teachers can bring the best out from students. David et al (2004) [6] study reveals that salary satisfaction is important factor in job satisfaction. Deshields (2005) [7] et al examines that Herzberg's two-factor theory works in student satisfaction if faculty satisfied their positive teaching brings positive satisfaction among students otherwise, they feel dissatisfied with bad teaching experience. Dev et al (2017) [8] investigation reveals that there is positive relationship between work culture and employee satisfaction. Gary et al (2005) [9] explains that the students and faculty perceptions are different for academic's success. Hill et al (2003) [10] research reveals that lecture quality and student support system are most important factors for quality education. Kreamer et al (2005) [11] explores that experienced and old teachers have more absent rate than new teachers. Luis et al (1984) [12] examines that union faculty members have higher satisfaction rate than non-union faculty members. Muhammad et al (2010) [13] said that job design, work culture and autonomy in decision making are important influencer in higher education. Murlidharan et al (2009) [14] reveals that salary should be given to teacher's performance basis. Rivkin et al (2005) [15] explores that reduction in class size increase the efficiency of teachers.

3. PROBLEM FORMULATION :

The main objective of the study is to find the anxiety level of the contract faculty working in engineering colleges and their effect on job satisfaction level.

4. INTENT OF THE STUDY :

To finding the solution of the research problem the below hypothesis has been constructed to find the relationship between employment assessment level and anxiety level with job satisfaction. Remembering the ultimate objective to achieve the already specified goals, the hypothesis was delivered and attempted at 0.05 significance level with the help of conceptual model shown in figure 1.





5. HYPOTHESIS :

 H_0 : There is no significant relationship between stress level and better employment policies resultant in job satisfaction of contract faculty and more retention rate in future

 H_1 : There is a significant relationship between stress level and better employment policies resultant in job satisfaction of contract faculty and more retention rate in future

6. TOOLS & TECHNIQUES :

Stability of the research: Total 150 faculty members of different engineering and management colleges as well as university responded the survey and their demographic profile as shown in Table 1. For stability of the research the Cronbach alpha has been established to find the concreteness of the instrument items used for research. The Cronbach alpha values of .922 have been established for the 12 items of occupation fulfilment level which ensures its stability as shown in Table 1.

Table 1: Demographics of the study with Cront	oach's Alpha
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Cronbach's Alpha	No. of Items	
.922	12	
Demograp	hic Profile	
Gender	Frequency	
Male	82	
Female	68	

Table 1.1: Strength of the instrument with KMO and Bartlett's Test

KMO and Bartlett's Test				
Kaiser-Meyer- Olkin Measure of Sampling Adequacy				
Bartlett's Test of Approx.Chi Square				
Sphericity	Df	91		
	Sig.	0.000		

The Kaiser-Mayer-Olkin (KMO) measure of sampling adequacy is 0.8 which is high and adequate that means the instrument parameters are strong and can be used for further research as shown in Table 1.1.

Table 2.1: Contract policies impact on Job Dis satisfaction

ANOV	A ^b
------	----------------

Mode	1	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	79.866	1	79.866	91.394	.000 ^a
	Residual	260.414	298	.874		
	Total	340.280	299			

a. Predictors: (Constant), Contract Policies

b. Dependent Variable: Job Dissatisfaction

Table 2.2: Contract policies Impact on Job Dis satisfaction

Coefficients **Unstandardized Standardized** Coefficients Coefficients Model В Std. Error Beta Sig. f 1.027 .132 .000 (Constant) 7.772 Contract .428 9.560 .045 .484 .000 policies

* Significance level ($a \le 0.05$).

We can find out from above table 2.1. and 2.2 linear regression method of Anova that there is positive job dis satisfaction impact on teachers, teaching in border areas is immense as significance level falls under 0.05 which is positive and significant becomes factor of faculty turnover.

Table 3.1:	Contract policies	impact or	n Stress Level

	ANOVA						
Mod	lel	Sum of Squares	Df	Mean Square	F	Sig.	
1	Regression	2.711	1	2.711	2.474	.117 ^a	
	Residual	326.635	298	1.096			
	Total	329.347	299				

a. Predictors: (Constant), Contract Policies

b. Dependent Variable: Stress level

Table 3.2: Contract policies on Stress Level

Coefficients^a **Unstandardized Standardized** Coefficients Coefficients Model В Std. Error Beta Sig. t 2.074 (Constant) .148 14.017 .000 Contract .079 .091 .050 1.573 .117 Policies

* significance level (a≤0.05).

According to above table 3.1 and 3.2 there is positive impact of contract policies on stress level of teachers maybe it will increase due to hectic job hours and discriminative human resource management these resultants in lower retention rate of faculty members in future.

Table 4.1: Contract Policies impact on Salary dissatisfaction

ANOVA ^b

Mod	el	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	110.070	1	110.070	84.512	.000 ^a
	Residual	388.117	298	1.302		
	Total	498.187	299			

a. Predictors: (Constant), Contract Policies Impact

b. Dependent Variable: Salary Dis satisfaction

Table 4.2: Contract Policies impact on Salary Dissatisfaction

Coefficients^a

Unstandardized Coefficients		Standardized Coefficients				
Model		В	Std. Error	Beta	t	Sig.
1 (Ce	Constant)	1.353	.161		8.388	.000
Co Po	ontract olicies	.503	.055	.470	9.193	.000

* significance level (a≤0.05).



Above table 4.1 and 4.2 also indicates that there is positive impact of contract policies on salary dis satisfaction as significance level is under 0.05 which is positive and significant may be due to unethical policies. This may help the turnover of faculty more rigorously.

 Table 5.1: Contract Polices impact on Career Stagnation

 ANOVA

			люта			
Mode	1	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	128.413	1	128.413	132.473	.000 ^a
	Residual	288.867	298	.969		
	Total	417.280	299			

a. Predictors: (Constant), Contract Policies Impact

b. Dependent Variable: Career Stagnation

Table 5.2: Contract Policies impact on Career Stagnation

	Coefficients ^a								
Unstandardized Coefficients		Standardized Coefficients							
Model		В	Std. Error	Beta	t	Sig.			
1	(Constant)	1.218	.139		8.752	.000			
	Contract Policies Impact	.543	.047	.555	11.510	.000			

* significance level (a≤0.05).

As above table 5.1 and 5.2 indicates that there is hardly any opportunity of career growth due to these policies. As significance level under 0.05 which shows there is positive relation between contract policies on career growth. This stagnation contributes more on turnover and resultant in less retention rate.

Table 6.1: Contract Policies impact on Job Security

ANOVA^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	203.195	1	203.195	201.874	.000 ^a
	Residual	299.951	298	1.007		
	Total	503.147	299			

a. Predictors: (Constant), Contract Policies Impact

b. Dependent Variable: Job Security Feeling

 Table 6.2: Contract Policies impact on Job Security

	Coefficients								
Model		Unstandardized Coefficients		Standardized Coefficients					
		В	Std. Error	Beta	t	Sig.			
1	(Constant)	1.548	.142		10.913	.000			
	Contract Policies Impact	.683	.048	.635	14.208	.000			

* significance level (a≤0.05).



Above table 6.1 and 6.2 illustrates that due to contract policies there is hardly any job security for faculty as significance level is under 0.05. This contract policies impact further contributes to the less retention rate which is danger signs for the administration.

Table 7 also elucidates ANOVA test there is a positive relationship between work culture and anxiety level of the contract faculty, if work culture in the colleges offers better culture for work, then contract faculty anxiety level decreases resultant in more retention rate and if college work culture hinders the work, then anxiety increases which results less retention. At last Table 7 shows that there is no relationship between feelings of job security and anxiety level as ANOVA test significance value falls around 0.72 which is above 0.05 means does not have any impact on retention rate of faculty members in border area.

	ANXIETY LEVEL						
Personnel	Sum of	10					
policies	Squares	df	Mean Square	F	Sig.		
Between Groups	20.250	5	5.063	5.083		0.00	
Within Groups	144.423	145	.996				
Total	164.673	150	. <u> </u>				
Faculty							
development	Sum of	10		-	<i></i>		
programme	Squares	df	Mean Square	F	Sig.		
Between Groups	26.292	5	6.573	6.887		0.00	
Within Groups	138.382	145	.954				
Total	164.673	150					
Career growth	Sum of Squares	df	Mean Square	F	Sig.		
Between Groups	10.366	5	2.591	2.435		0.05	
Within Groups	154.308	145	1.064				
Total	164.673	150	· · · · · ·				
Appreciation of good work	Sum of Squares	df	Mean Square	F	Sig.		
Between Groups	2.072	5	.518	.462	~-8.	0.76	
Within Groups	162.602	145	1.121				
Total	164.673	150					
Research	Sum of						
Support	Squares	df	Mean Square	F	Sig.		
Between Groups	9.615	5	2.404	2.248		0.05	
Within Groups	155.058	145	1.069				
Total	164.673	150					
Work culture	Sum of Squares	df	Mean Square	F	Sig.		
Between Groups	13.670	5	3.418	3.282		0.01	
Within Groups	151.003	145	1.041				
Total	164.673	150					
Job security	Sum of Squares	df	Mean Square	F	Sig.		

Table 7: ANOVA for different variables of contract faculty in relation to anxiety level

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ANXIETY LEVEL						
Personnel policies	Sum of Squares	df	Mean Square	F	Sig.	
Between Groups	20.250	5	5.063	5.083	0.00	
Within Groups	144.423	145	.996			
Between Groups	2.302	4	.575	.514	0.72	
Within Groups	162.372	145	1.120			
Total	164.673	149				

Table 8: Job satisfaction level of contract faculty of various engineering institutions with Scheffe Test.

	Scheffe Test		
		Subset	t for alpha = 0.05
College or University name.	Ν	1	2
Sri Sai College of Engineering and Technology (SSCET)	11	1.3636	
Swami Sarvanand Institute of Engineering and Technology. (SSIET)	25	1.8000	1.8000
Aman Bhalla College of Engineering and Technology (ABCET)	10	1.9000	1.9000
Beant College of Engineering and Technology (BCET)	59	2.2034	2.2034
ArniUniversity (AU)	18	2.4444	2.4444
Sukhjindra College of Engineering and Technology (SCET)	15	2.5333	2.5333
Golden College of Engineering and Technology (GCET)	12	-	3.0000
Sig.		.123	.103

*Means for groups in homogeneous subsets are displayed.

Table 8 represents Scheffe test results for all the colleges which has been used for research for contract faculty. The first column represents the group of college or university name with the lowest to the highest mean and second column represents the frequency details and third set represents subsets for alpha = 0.05.

Table 8 describes that the only college that are different are Sri Sai College of Engineering and Technology (SSCET) and Golden College of Engineering and Technology. (GCET). Finding the causes of significant statistically variations among the means of job satisfaction level of the faculty of



different engineering institutions, Scheffe test used for post comparisons for all the engineering institutions as seen in Table 9.

Engineering Institutions Mean	BCET	SSIET	SCET	ABCET	GCET	SSCET	AU	
Total BCET 2.20								
SSIET 1.80								
SCET 2.53								
ABCET 1.90								
GCET 3.00	*	*	*	*		*	*	
SSCET 1.36								
AU 2.44								

Table 9: Statistically significant variations for different engineering institutions of district Gurdaspur

* significance level (a ≤ 0.05).

As seen in Table 9, there are significant statistically variations in the job satisfaction level among the faculty of different engineering institutions of Gurdaspur district. Mean value of Golden College of Engineering and Technology (GCET) was highest, i.e., 3.00 and resulted in higher level job satisfaction results in more retention rate than the other institutions. This may be possible due to strong social bonds among the faculty members, clear policies, location advantages, etc.

The study shown satisfaction index with the help of following graphical representation in Figure 1.



Fig. 1: Scheffe test with mean satisfaction index for contract faculty of Engineering institutions

The present study shown scheffe test with mean satisfaction index Figure 1 that the mean level of colleges BCET (Beant College of Engineering and Technology) 2.20, SSIET (Swami Sarvanand Institute of Engineering and Technology) 1.80, SCET (2.53), ABCET (Aman Bhalla College of Engineering and Technology) 1.90, GCET (Golden college of Engineering & Technology) 3.00, SSCET (Sri Sai College of Engineering and Technology) 1.36 and AU (Arni University) 2.44 never crosses 3.00 for any college in the district at significance level 0.002 which is less than 0.05.

This result explains that the satisfaction level of the contract faculty in all the colleges are not good and resultant in less retention rate in the future [16].



level of contract faculty					
Anxiety significance level in relation to contract faculty employment assessment level					
Parameters	Significance level (stress indicator)				
Personnel Policies	0.00				
Faculty Development Programme	0.00				
Career Growth	0.05				
Appreciation of Good work	0.76				
Research Support	0.05				
Work Culture	0.01				
Feeling of job security	0.72				

Table 10: Anxiety significance level in relation to different parameters of employment assessment level of contract faculty

* significance level (a ≤ 0.05).

The relationship between anxiety level and personnel policies has been conducted with the help of ANOVA and it shows in Table 10 that there is a positive relationship between the parameters as it falls under range of 0.05 significance level. It means if personnel policies are better anxiety level decreases results in more retention rate, if worst it increases result in less retention rate. There is a positive relationship between faculty development programmes and with anxiety level as its significance level is 0.00 as shown in the Table 9 which means this factor helps in retention rate. Table 10 also explain there is a positive relationship between career growth and anxiety level. If college administration provides suitable path for career growth, the anxiety level decreases results in more retention rate else increases results in less retention rate. It further illustrates that there is no relationship between anxiety level and appreciation of good work as significance value falls around 0.76 which is above 0.05 means no effect on retention rate. Table also demonstrates that there is positive relationship between anxiety level and research support means it positive impact increases the retention rate. As ANOVA test reaches around 0.05 significance level. It means if good research support facilities provided for the faculty, then anxiety level decreases if facilities are not up to the mark, then it increases. Table 11 illustrates the Clinical stress analysis model with retention rate for contract faculty which has been developed to define the stress level of the faculty along with retention rate, parameters which produces more stress during the job in the above study like feeling of job security and appreciation of good work fall under stress indicator poor with a scale of -2 which is not a good signal for the institutions in the district resultant in less retention rate in future whereas parameters like faculty development programme and personnel policies fall under outstanding category of stress indicator with a scale rating of 5 and so the parameter of work culture which is a good signal for the institutions resultant in more retention rate whereas parameters like career growth and research support are fall under normal category of stress indicator with scale rating of 0 means it should be taken care otherwise beyond this they will reach bad stress indicator category and resultant in worst retention rate of faculty in future.

Significance Level	Stress Indicator	Scale Rating (Retention Rate)
0.00	Outstanding	5
0.01	Magnificent	4
0.02	Excellent	3
0.03	Very Good	2
0.04	Good	1
0.05	Normal	0
0.05 - 0.10	Bad	-1
0.11 - 0.90	Poor	-2
0.91 - 1.00	Very Poor	-3
1.01 - 1.90	Worst	-4
1.91- 2.00	Dangerous	-5

Table 11: Clinical Stress Analysis Model along with Retention Rate for contract faculty





Fig. 2: Graphical representation of significance level of contract faculty with different variables

The subject has not been considered earlier, consequently, now an engineering college of fringe territory Gurdaspur, have a chance to use the data from this paper to plan their future line of activity that can help them to outline their long-haul approaches. With the aid of this manuscript, administrators should assess the future of teaching in developing country like India and try to build new policies and models to control the stress level which will increase their retention rate of faculty and also help to raise the teaching standards for the nation.

7. OUTCOMES ANALYSIS :



Fig. 3: Modified conceptual model of study



From the above findings the alternate hypothesis has been accepted that there is a significant relationship between stress level and better employment policies resultant in job satisfaction of contract faculty and more retention rate in future with modified conceptual model shown in figure 3. So, above model has been developed after analysis of the findings.

8. CONCLUSION :

In view of the repercussion of this research, the investigation finishes up with thrilled discoveries about the inevitable alternative hypothesis acceptance has been represented through figure 1 which explain it clearly that personnel policies, faculty development, career growth, research support and work culture falls clearly under significance level of 0.05 as shown in Table 10, which exorbitant accord that these parameters should clearly considered by the administration of the engineering colleges of district Gurdaspur, Punjab while endow any policies for the contact faculty in the future so that their satisfaction level and retention rate amid their jobs won't detrimental. Graphical representation of significance level of different variables also shown in the Figure 2 which clearly embark the two factors as appreciation of good work and feeling of job security falls above the 0.05 significance level which represents there is no relation of these factors to anxiety level of contract faculties and retention rate.

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