

Effect of Human Factors on Technical Institute Performance

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Abstract—Higher education is gaining importance in today’s society rapidly. With lot of emphasis on research and good job opportunities for highly qualified people, more and more people are intending to go for higher education. These factors demand high quality of education system unquestionably. It is believed that higher education has direct impact on our society and improving higher education quality will reflect on the wellbeing of our society. Research shows that highly motivated human resource can play a pivotal role in defining the performance of a technical institute. In this research, a survey was conducted in technical institutes to examine the effect of human factors on the technical institute performance. A questionnaire was designed based on the available literatures and served to target population as per sampling. The results obtained from statistical analysis showed that motivational factors have positive influence on technical institute performance and also demographic factors such as marital status and work experience of the employees have substantial impact on the technical institute performance.

Index Terms—Demographic factors, motivational factors, technical institute performance, statistical analysis, regression analysis.

I. INTRODUCTION

Higher education plays an important role in preparing people to face the societal challenges leading to sustainable development of the mankind [1]. Research and teaching plays a vital part in improving today’s economy that is highly knowledge based. It is a widely accepted fact that higher education is highly influencing engineering, medical and management fields thereby playing an un-parallel role in negotiating the ever increasing societal challenges. Many researchers have argued that higher education definitely has direct impact on the society and a lot of studies have been conducted to identify the various parameters that hinder the progress of the higher education system. Fig.1 shows the tangible and intangible factors influencing the higher education system.

In this research an effort is made to apply the organizational behaviour concepts on higher education institute to understand dynamics of performance. The study of inter-relationship between these factors gives impact of individual and group human behavior on institute performance.

The research objective is to study the effect of human factors such as demographic characteristics and motivational factors on technical institute performance.

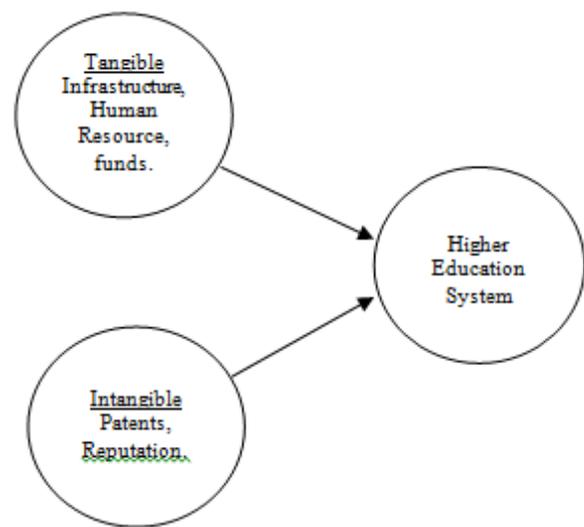


Fig.1. Factors Influencing Higher Education System

II. LITERATURE REVIEW

World class universities are now a days more flexible and much more dynamic than they were sometime back. This change can be constituted to the ever changing external environments and the rapid changing corporate and technological world. To deal with such situations, learning organization concepts can be followed for fruitful results [2]. This paper focuses on what people do in an organization and how their behavior affects the organization’s performance. Lot of studies has tried to understand the effect of human factors on business performance. This research is conducted to analyse the effect of individual factors like demographic factors and motivational factors on group factor such as the technical institute performance. Michael Bull [3] emphasized that enterprise need to have sufficient resources to obtain consistent results and defined various parameters to assess the performance.

The demographic characteristics considered in this paper are gender, age, marital status, educational qualification, work experience, & work position.

An employee's age, education, position and gender are significant antecedents of work values [4]. This can be of immense help to the management in theory as well as practice. It is possible for the firms to create healthy work environments where all feel like winners when they understand that demographic differences influence the work values [5]. The learning culture of an organization is very important and is influenced by the factors like age and education level [6].

Gender: Compared to females, males showed higher work value perceptions [4]. Studies conducted by researchers have highlighted the fact that women are no way lesser than men and women are capable of demonstrating required skills in management and leadership [7] [8].

Age: With age, an employee's ability and decision making at work gets better along with their work life balance and attitude towards work [4].

Marital Status: Married employees are more focused towards the job security factor and are comparatively more loyal and responsible. It is generally seen that married people are more likely to settle down at a place compared to the unmarried employees who are ready to relocate when it comes to better job positions [9].

Educational Qualification: It is observed in general that, with education people tend to be more motivated and focused to excel and seek recognition for good work. This holds good for jobs that are relatively complex such as research or medicine or engineering [10].

Work Experience: Organizations should look to tap the experience of the older employees and see to it that they be given certain supervisory or mentorship positions so that they can guide the younger employees. This could work well with the organizational point of view [4].

Work Position: It was observed that with higher work responsibilities people may perform better and produce better results for the organizations [4].

Career satisfaction, job involvement, and organizational commitment are the factors that motivate employees to perform well towards goal achievement. Incentives, reward systems and responsibilities also act as encouraging elements which in turn influence individual performance [13].

III. RESEARCH METHODOLOGY

Based on the various literature studied, an attempt is made to answer to the research questions framed. Literatures were surveyed to identify the individual level variables and group level variables that are effecting organization or business environment. A qualitative research was undertaken in the field of higher education.

The purpose of this research is to study the impact of human behavior on technical institute performance. On completion of the literature study a questionnaire was developed to be used as measuring instrument [11]. A structured, closed-ended questionnaire was used to collect data from 21 engineering colleges of Udipi and South-Canara districts, India.

A. Population and Sampling

Population size is found to be 2344 persons and sample size (n) can be calculated using the formula as given [12].

$$n = \frac{z^2 \cdot p \cdot q \cdot N}{e^2 (N-1) + z^2 \cdot p \cdot q} = 174 \text{ samples.}$$

Where, $z = 1.96$, (as per table of area under normal curve for the given confidence level of 95%);

$p = 0.02$, (probability value which is the result of a pilot study);

$N = 2344$ persons

$e = 0.02$ (since the estimate should be within 2% of true value).

B. Sampling Method

In order to obtain better results questionnaires were distributed uniformly to the population with exact cadre ratio. Therefore dis-proportionate stratified sampling method is used in this research with population size of 1544 is considered for the calculation of proportions as shown in table I.

TABLE I:
SAMPLING TABLE.

Dis-Proportionate Stratified Sampling				
Sl.No	Work Position	No. of Employees	Proportion	Sample Size of Strata
1	Professor	166	0.11	19
2	Associate Professor	131	0.08	15
3	Assistant Professor	857	0.56	97
4	Others	390	0.25	44
Total		1544	1	174

IV. DATA ANALYSIS AND RESULTS

The data is collected from the survey conducted by using web questionnaire supported by surveygizmo. This web questionnaire was sent to respective respondents to their e-mails and same was collected in surveygizmo.

Then this data was extracted from the surveygizmo and analyzed using Statistical Package for the Social Science (SPSS). Each questionnaire data was carefully coded before the analysis.

The analysis indicates that the highest number of samples of gender is 144 male respondents or 80%; the highest number of samples of age is between 20-30 years old is 90 or 50%; the marital status of the hypothesis test

recommend to population is 91 or 51% of married people is highest, the education levels of the hypothesis test suggest to population is PG with 122 or 68% that is highest; the work experience of the samples less than 5years is 87 or 48% that is more respondent than other work experience; In the work positions assistant professor are 113 or 63% which is the highest of respondent.

**TABLE II:
THE ANALYSES OF DEMOGRAPHIC FACTORS HAVE EFFECT ON TECHNICAL INSTITUTE PERFORMANCE**

A. The results of gender has effect on technical institute performance – Independent Sample t-Test					
<i>Variable</i>	<i>Gender</i>	<i>Mean</i>	<i>Standard Deviation (S.D)</i>	<i>Statistics</i>	<i>Significance Value</i>
Technical Institute Performance	Male	28.69	4.620	0.913	0.341
	Female	30.41	4.272		
B. The results of age has effect on technical institute performance - One Way Anova Test					
<i>Variable</i>	<i>Age</i>	<i>Mean</i>	<i>Standard Deviation (S.D)</i>	<i>Statistics</i>	<i>Significance Value</i>
Technical Institute Performance	20-30	28.71	4.02	2.303	0.079
	31-40	30.11	5.1		
	41-50	27.48	5.57		
	above 50	30	2.31		
C. The results of marital status has effect on technical institute performance - Independent Sample t-Test					
<i>Variable</i>	<i>Marital Status</i>	<i>Mean</i>	<i>Standard Deviation (S.D)</i>	<i>Statistics</i>	<i>Significance Value</i>
Technical Institute Performance	Unmarried	28.71	3.97	4.021	0.046
	Married	29.36	5.13		
D. The results of education level has effect on technical institute performance -One Way Anova Test					
<i>Variable</i>	<i>Education Level</i>	<i>Mean</i>	<i>Standard Deviation (S.D)</i>	<i>Statistics</i>	<i>Significance Value</i>
Technical Institute Performance	UG	31	4.21	2.039	0.133
	PG	28.66	4.04		
	Above PG	29.4	5.96		
E. The results of work experience has effect on technical institute performance -One Way Anova Test					
<i>Variable</i>	<i>Work Experience</i>	<i>Mean</i>	<i>Standard Deviation (S.D)</i>	<i>Statistics</i>	<i>Significance Value</i>
Technical Institute Performance	Less than 5 Years	28.28	3.89	3.272	0.022
	5 to 10 Years	30.63	4.06		
	10 to 15 Years	30.38	6.59		
	Above 15 Years	28.38	4.92		
F. The results of work position has effect on technical institute performance - One Way Anova Test					
<i>Variable</i>	<i>Work Position</i>	<i>Mean</i>	<i>Standard Deviation (S.D)</i>	<i>Statistics</i>	<i>Significance Value</i>
Technical Institute Performance	Professor	30.41	3.55	1.228	0.301
	Associate Professor	28.19	6.98		
	Assistant Professor	28.84	4.01		
	Others	30	4.42		

A. The results of gender has effect on technical institute performance

The research used independent sample t-test to test the hypothesis 1.1

Hypothesis 1.1

H₀1.1.1: Gender has no effect on technical institute performance.

H_a1.1.2: Gender has effect on technical institute performance

The result found that the female has higher mean (mean = 28.69, Standard Deviation (S.D.) = 4.620) than male (mean = 30.41, S.D. = 4.272) and also found that the t-value is 0.913, p-value is 0.341. Since the p-value is greater than 0.05, null hypothesis is accepted at 5% level of significance. Therefore, gender has no effect on technical institute performance at the 5% significant level as described in table II.

B. The results of age has effect on technical institute performance

The research used one way Anova test to test the hypothesis 1.2

Hypothesis 1.2

H₀1.2.1: Age has no effect on technical institute performance.

H_a1.2.2: Age has effect on technical institute performance.

The analysis of variance indicates that the highest mean is age between 31-40 years old and the second ranking is age above 50 years. The third ranking is age between 41-50 years old and last ranking is age between 20-30 years. Moreover, the analysis also shows that the F-value is 2.303 and p-value is 0.079 ($p > 0.05$), therefore, we have accepted the null hypothesis or alternate hypothesis was rejected.

So, age has no effect on technical institute performance at 5% significant levels as described in table II.

The analysis found that age has no effect on technical institute performance, the difference between each age level and technical institute performance. The table shows that the age between 41-50 years old is significantly different from the other age groups.

C. The results of Marital Status has effect on technical institute performance

The research used Independent Sample t- test to test the hypothesis 1.3

Hypothesis 1.3

H₀1.3.1: Marital status has no effect on technical institute performance.

H_a1.3.2: Marital status has effect on technical institute performance.

The analysis shows that the highest mean is married, the second ranking is unmarried. The analysis also shows that the t-value is 4.021 and p-value is 0.046 ($p < 0.05$), which means the null hypothesis was rejected. Therefore, marital status has effect on technical institute performance at 5% significant level as described in table II.

D. The results of Education level has effect on technical institute performance

The research used one way Anova test to test the hypothesis 1.4

Hypothesis 1.4

H₀1.4.1: Education level has no effect on technical institute performance.

H_a1.4.2: Education level has effect on technical institute performance.

The analysis of variance shows that the highest mean is for UG, the second ranking is for above PG, the third ranking is for PG. The analysis also shows that the F-value is 2.039 and p-value is 0.133 ($p > 0.05$), which means we have accepted the null hypothesis or alternate hypothesis was rejected. Therefore, education level has no effect on technical institute performance at 5% significant level as described in table II.

E. The results of Work experience has effect on technical institute performance

The research used one way Anova test to test the hypothesis 1.5

Hypothesis 1.5

H₀1.5.1: Work experience has no effect on technical institute performance.

H_a1.5.2: Work experience has effect on technical institute performance.

The analysis of variance indicates that the highest mean is for 5 to 10 years of experience, the second ranking is for 10 to 15 years of experience, the third ranking is for above 15 years of experience, and last ranking is for less than 5 years of experience. The analysis also shows that the F-value is 3.272 and p-value is 0.022 ($p < 0.05$), which means the null hypothesis was rejected. Therefore, work experience has strong effect on technical institute performance at 5% significant level as described in table II.

F. The results of Work position has effect on technical institute performance

The research used one way Anova test to test the hypothesis 1.6

Hypothesis 1.6

$H_{01.6.1}$: Work position has no effect on technical institute performance.

$H_{a1.6.2}$: Work position has effect on technical institute performance.

The analysis of variance indicates that the highest mean is for professor cadre, the second ranking is for lecturer cadre which is specified as others in the sampling table-I, the third ranking is for assistant professor cadre, the fourth ranking is for associate professor cadre. The analysis also shows that the F-value is 1.228 and p-value is 0.301 ($p > 0.05$), which means that null hypothesis is accepted. Therefore, work position has no effect on technical institute performance at 5% significant levels as described in table II.

G. The results of motivational factors have effect on technical institute performance

The research used regression analysis test to test the hypothesis 2.1

Hypothesis 2.1

$H_{02.1.1}$: Motivational factors have no effect on technical institute performance.

$H_{a2.1.2}$: Motivational factors have effect on technical institute performance.

**TABLE III:
REGRESSION ANALYSIS RESULTS**

Variables/ Predictors	Unstandardized Coefficients		t-value	p-value
	B	Std. Error		
(Constant)	15.053	1.495	10.071	0.000
Motivational Factors	0.659	0.069	9.526	0.000
Model summary				
Model			Regression	
Multiple R-Value			0.581	
R-Square Value			0.338	
Adjusted R-Square Value			0.334	
F-Value			90.742	
Significance of F			0.00	

Simple regression analysis was performed to study the inter-relationship between motivational factors and technical institute performance. Based on the above results the R-Square Value is 0.338 which means that 33.8 percent of related variation to the technical institute performance can be estimated by the motivational factors. From the above results p-value is found to be 0.00 ($p < 0.01$), this implies that motivational factors have a substantial influence on technical institute performance. Column of unstandardized coefficient shows 0.069 which means there is a positive influence. Based on the analysis it is clear that for each unit rise of the motivation level, technical institute performance increases to 0.069 units consequently. Thus, the formulated null hypothesis (2.1.1) will be rejected in this study. Therefore, motivational factors have effect on technical institute performance at 1% significant level as described in table III.

According to above results, the regression equation is:
 $Y = 15.053 + 0.659X$

Technical Institute

Performance = $15.053 + 0.659(\text{Motivational Factors})$.

H. Summary of effect of Human factors on technical institute performance

**TABLE IV:
SUMMARY OF EFFECT OF HUMAN FACTORS ON
TECHNICAL INSTITUTE PERFORMANCE**

Hypotheses	Description of H_0	Significance Value	Result
1.1.1	Gender has no effect on technical institute performance	0.341	Accept
1.2.1	Age has no effect on technical institute performance	0.076	Accept
1.3.1	Marital Status has no effect on technical institute performance	0.046*	Reject
1.4.1	Education Level has no effect on technical institute performance	0.133	Accept
1.5.1	Work Experience has no effect on technical institute performance	0.022*	Reject
1.6.1	Work Position has no effect on technical institute performance	0.301	Accept
2.1.1	Motivational factors have no effect on technical institute performance	0.000**	Reject

Note: * Reject null hypothesis at 5% significance level.
** Reject null hypothesis at 1% significance level.

The table IV shows the results obtained from the statistical test conducted to analyze the influence demographic factors on technical institute performance. All the tests were performed at 5% significance level and the results are obtained based on the statistics indicates that marital status and work experience has influence on technical institute performance. Other factors like gender, age, education level, work position has no influence on technical institute performance. Regression analysis is performed at 1% significance level and results indicate that motivational factors are positively related to technical institute performance.

V. CONCLUSION

The statistical analysis conducted in this research to examine the influence of various parameters showed that demographic characteristics and motivational factors had significant influence on the technical institute performance. In demographic characteristics, factors like marital status and work experience have significant impact on technical institute performance and other demographic factors like gender, age, education level, work position have no much influence over technical institute performance. This research suggests the managers to look upon the current performance appraisal system and modify it based on the motivational factors. Managers have to identify motivating factors in employees that influences them positively in bringing good results.

This research could facilitate the managements to understand the various significant aspects that influence the technical institute performance and also help in maintaining transparency about the overall quality of the institute.

This study could also help the management to develop plans to overcome the hitches that they are facing and take actions accordingly that could possibly give them competitive advantage.

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