FORMULATION OF STRATEGIES FOR QUALITY MANAGEMENT OF INDIAN TECHNICAL INSTITUTES THROUGH PERSONALITY DEVELOPMENT OF STUDENTS

Anamika Kumari*, Chandan Bhar, P. C. Pal*****

chandanbhar@hotmail.com

ABSTRACT

Personality development of students has been found to be one of the important factors affecting the performance of the technical institutes. This paper discusses the process of formulation of strategies for improving personality of students studying in technical institutions. Appropriate hypotheses were developed to study the impact of various factors affecting the personality of the students. A specially designed questionnaire was administered to the select stakeholders of the technical education sector – students, family of students pursuing technical education, and faculty members of technical institutes. The responses received from the respondents were used to check the acceptance of the hypotheses. Finally, the accepted hypotheses were used to formulate appropriate strategies for improving the personality of the students pursuing technical education, which will ensure quality management of technical institutes in India.

1. INTRODUCTION

Technical institutes in India face several problems for maintaining quality of services rendered by them. Quality problem in technical institutes arises mainly due to lack of dedicated faculty members along with shortage of technically qualified staff members, lack of interest among students in gaining knowledge, results in non-fulfilment of requirements of industries, which finally results in low placement of students in industries. In India, it is expected that all academic programmes offered by technical institutes are required to be accredited by National Board of Accreditation (NBA), but many institutes have not opted for it as the accreditation of technical education programme by NBA is not mandatory. This results in degradation in quality of programmes offered by the institutes [Prasad and Bhar, 2010].

The problems affecting the quality of services rendered by the technical institutes in India as well as the expectations of the stakeholders have been identified through extensive review of literature, which have led to the identification of factors affecting the performance of institutes. It has been observed that personality development of students is one of the key factors affecting the quality of service rendered by the institutes [Anamika, 2010]. To study the impact of the various factors affecting the personality of the students, appropriate hypotheses were formulated. A specially designed questionnaire was developed and administered to major stakeholders of the sector for testing these hypotheses. Finally the accepted hypotheses were used to formulate the strategies for improving the personality of students. It is expected that the strategies designed through this process will improve the personality of the students studying in the institutes and will help the institutes to improve the quality of its output.

2. DEVELOPMENT OF HYPOTHESES

It has been observed through extensive review of literatures that Personality Development of Students plays a major role in maintaining quality of output of the technical institutes. In order to study

** Ex-JRF, *** Professor, Department of Applied Mathematics, Indian School of Mines, Dhanbad (Jharkahnd)*

***Professor, Department of Management Studies, Indian School of Mines, Dhanbad (Jharkhand)*

the impact of various factors on the personality of students, following hypotheses were formulated [Anamika, 2010].

H_{01}: Inclusion of business communication in course curriculum will help to develop the personality of students.

H_{02}: Employment of career counsellor will assist the personality development of students.

H_{03}: Participation in extra-curricular activities (technical/social) will ensure the personality development of students.

3. DEVELOPMENT OF QUESTIONNAIRE FOR TESTING OF HYPOTHESES

One of the pre-requisite for testing the hypotheses is to develop an appropriate questionnaire for collecting responses from the respondents. A structured questionnaire consisting of the following questions was prepared on five point Likert's scale taking into consideration hypotheses formulated for this study.

Q.1. "Inclusion of business communication in course curriculum will help to develop the personality of students."

Q.2. "Employment of career counsellor will assist the personality development of students."

Q.3. "Participation in extra-curricular activities (technical/social) will ensure the personality development of students."

The questionnaire was administered to select stakeholders of the sector, i.e., students, faculty members and family of students. To obtain appropriate responses, relevant questions were administered to each group of stakeholders. Accordingly, the questionnaire containing Q.1 and Q.2 was administered to faculty members; Q.3 was administered to family members of students, while the questionnaire containing all the three questions was administered to the students. .

4. LIKERT'S SCALING

This method is used to discriminate respondents on the basis of total score obtained. Those items or statements that best meet this sort of discrimination test are included in the final instrument. Respondents indicate their agreement or disagreement with each statement in the instrument. Each response is given a numerical score, indicating its favourableness or unfavourableness and the scores are totalled to measure the respondent's attitude. The respondent is asked to respond to each statement in terms of several degrees, usually five degrees of agreement or disagreement - Strongly Agree, Agree, No comment, Disagree, and Strongly Disagree. Response indicating the least favourable is given the least score and the most favourable is given the highest score [Kothari, 2000].

5. PRE-TESTING OF QUESTIONNAIRE

Pre-testing of the survey instrument is important to ensure that respondents have properly understood the questions framed. In this survey, the pre-testing was done through the administration of questionnaire to some of the family members of students, faculty members, and students. For pre-testing of the questionnaire, responses were collected from 11 students, 5 faculty members and 30 families of students. The sample size for pre-testing the questionnaire was decided according to the population size to be sampled for final administration of the questionnaire. Reliability refers to the extent to which a scale produces consistent results if measurements were made repeatedly. This was done by determining the association between scores obtained from different administrators of the scale. If the association is high, the scale yields consistent results and the scale is reliable. One of the approaches used for assessing the reliability of the questionnaire is to determine 'co-efficient alpha' or 'Cronbach's alpha', which refers to average of all possible split-half coefficients resulting from different ways of splitting the scale items. The value of this coefficient varies between 0 and 1, and a value of 0.6 or less generally indicates unsatisfactory internal consistency reliability [Malhotra, 2001].

The reliability of the developed questionnaire was tested by deploying the statistical test 'Cronbach's alpha' to the responses received from all the categories of respondents selected randomly. The Cronbach's alpha have come out to be 0.836, 0.826, 0.630 for questionnaires designed for faculty members, family members, and students respectively, which indicates a good sign of reliability of questionnaires.

6. IDENTIFICATION OF SURVEY POOL

This study was planned for technical institutes located within the state of Jharkhand and Bihar, i.e., the technical institutes run by Government of India, institutes run by state governments, deemed universities offering technical education, and private technical institutes. However, in this study the samples were selected from the following institutes only :

- Indian School of Mines, Dhanbad

- Birla Institute of Technology, Mesra
- National Institute Technology, Patna

The reason for selection of these institutes lies on the fact that respondents from these institutes took active interest in responding the questionnaire. The samples from students as well as faculty members were selected from these institutes only. The family members of students pursuing technical education were selected from the state of Jharkhand.

6.1. Identification of Family Members of Students Pursuing Technical Education

The total population of this category of respondents were quiet large in the state of Jharkhand and Bihar and it was difficult to identify them for the purpose of this study. Thus a residential colony owned by a coal company was selected, which was providing residential accommodation to all categories of executives and staff members working in that company. During the year, 2009 it was observed that 1600 families of that colony had sent their children for technical education. This total population of 1600 families were divided into three strata as mentioned below:

- Executives occupying grade M1 and above were placed in one stratum
- Executives of grade E2 to E5 were placed in second stratum
- Third stratum was consisting of Executives of grade E1 and senior staff members

The sample size for this study was considered as 30% of the population size. Thus the sample size works out to be 480 families. The sampling was done by stratified sampling with proportional allocation. All families selected for sampling were visited personally for collecting their responses. Out of 480 families, 439 families participated in this study and remaining 41 families declined to give their responses. The detailed information regarding samples collected from family member of students have been presented in Table 1.

Table 1: Response Size of Each Stratum of Family Members of Students

Name of Stratum	Population size	Sample size	Response
Executives occupying grade M1 and above	143	43	35
Executives of grade E2 to E5	251	75	57
Executives of grade E1 and senior staff members	1206	362	347

6.2. Faculty Members of Institutes

Faculty members from all the three selected institutes were considered for sampling. List of faculty members from all the departments of each technical institute during the academic session, 2009-2010 were collected and were stratified according to the designation of faculty members. The total population of faculty members were divided into four stratums as presented below:

- Professors formed the first stratum
- Second stratum was formed with Associate Professors
- Assistant Professors formed the third stratum
- Senior Lecturers and Lecturers formed the fourth stratum

The total population of faculty members of these institutes were found to be 492. The sample size was considered as 30% of the total population and it works out to be 148. In this case, sampling design considered was stratified sampling with proportional allocation. The selected faculty members were visited personally for collecting their responses. Out of 148 selected faculty members, 130 had responded in this study. Table 2 presents detailed information regarding the response size of each stratum of faculty members of selected technical institutes.

Table 2: Response Size of Each Stratum of Faculty Members of Selected Technical Institutes

Stratum of Faculty Members		Indian School of Mines, Dhanbad	Birla Institute of Technology, Mesra	National Institute of Technology, Patna
Professors	Total number of Faculty Members	25	37	10
	Sample size	8	10	3
	Response	6	8	2
Associate Professors	Total number of Faculty Members	51	0	0
	Sample size	15	0	0
	Response	13	0	0
Assistant Professors	Total number of Faculty Members	64	60	14
	Sample size	19	18	4
	Response	17	16	3
Senior Lecturers and Lecturers	Total number of Faculty Members	18	188	25
	Sample size	6	57	8
	Response	4	55	6

6.1 Students Pursuing Technical Education

Considering the maturity level, students of master's degree as well as research programmes of selected institutes were considered for sampling. List of students pursuing master's degree and research programmes in these institutes during the academic session, 2009-2010 were collected and the total number of students in these categories were found to be 834. It was decided to sample 30% of the total population for this study. Accordingly, the total sample size was found to be 250. The population of students were stratified into two stratums, i.e., students pursuing master's degree programme and students pursuing research programme in the institutes. In this case also stratified sampling with proportional allocation was considered as sampling technique for obtaining the responses. Out of 250 samples, 226 students responded in this study. Table 3 provides the detailed information regarding the sampling of students from the selected institutes.

Table 3: Response Size of Each Stratum of Students of Selected Technical Institutes

Name of Institution	Master's Degree Programme			Research Programme		
	Total number of students	Sample size	Number of samples responded	Total number of students	Sample size	Number of samples responded
Indian School of Mines, Dhanbad	482	145	139	83	25	22
Birla Institute of Technology, Mesra	196	58	47	51	15	13
National Institute of Technology, Patna	22	7	5	0	0	0

To avoid any errors in response, students were contacted personally by the researcher to obtain their responses.

7. Method Applied for Testing of Hypotheses

The survey was conducted as per the availability and convenience of each group of respondents. Opinions of respondents were collected in five point Likert's scale with -2 for strongly disagree, -1 for disagree, 0 for no comment, 1 for agree, and finally 2 for strongly agree with the question asked. The survey responses were coded and the survey findings were analysed through the application of non-parametric statistical technique, χ^2 test at 5% level of significance.

χ^2 value is calculated as follows (Gupta & Kapoor, 2002)

$$\chi^2 = \sum \frac{(f_i - e_i)^2}{e_i}$$

Where, fi is the observed frequency of each scale of response,

e_i is the expected frequency of each scale of response.

The value of i depends on the type of opinions, i.e. strongly disagree, disagree, no comments, agree, strongly agree.

For the acceptance or rejection of the hypothesis, the calculated χ^2 value is compared with tabulated χ^2 value at particular degrees of freedom and % level of significance. The hypothesis H0 is accepted if the calculated χ^2 value is less than the tabulated χ^2, otherwise hypothesis is rejected. The tabulated χ^2 value depends on the value of degrees of freedom which varies according to the type of responses received, as well as, the level of significance. The degree of freedom is computed as (n-1), where n is the kind of scaling adopted by respondents for responding a question. If respondents have given their responses for Question No. 1 covering all the five points of the Likert scale, the degree of freedom for that question will be computed as 4. On the other hand, if the responses of the respondents for a particular question are restricted within three points of the 5-point Likert's scale, the degree of freedom will be computed as 2. Coldeway suggested (Coldeway, 1989) that for research publication and publication standards, 95% confidence level may be adopted as cut-off for testing of hypotheses. In this study, SPSS 10 software was used to conduct χ^2 test for testing of hypotheses.

8. Testing of Hypotheses regarding Personality Development of Students

The responses received from the respondents against the formulated questions were analysed through the computation of χ^2 values. The computed χ^2 values were compared with tabulated χ^2 values for determining acceptance or rejection of hypotheses. Table 4 presents the results obtained through the testing of hypotheses developed for ensuring personality development of students.

It can be seen from Table 4 that the following hypotheses were accepted on the basis of responses received from respondents.

- Inclusion of business communication in course curriculum will help to develop the personality of students.
- Employment of career counsellor will assist the personality development of students.

However, respondents have rejected the following hypothesis.

- Participation in extra-curricular activities (technical / social) will ensure the personality development of students.

Thus, it can be concluded that appropriate action must be taken by institutes for inclusion of business communication in course curriculum as well as employment of career counsellor for personality development of students.

9. FORMULATION OF STRATEGIES FOR PERSONALITY DEVELOPMENT OF STUDENTS

Personality development is one of the major factors affecting the performance of students. The accepted hypotheses were used for formulation of strategies to ensure personality development of students. The following strategies have been designed for this purpose.

i) Introduction of Business Communication in Course Curriculum

Table 4: Testing of Hypotheses for Personality Development of Students

Hypotheses	Frequency Table				Calculated χ^2	df	Tabulated χ^2	Result
Inclusion of Business Communication		Observed N	Expected N	Residual	9.197	4	9.488	Accepted
	-2.00	59	71.2	-12.2				
	-1.00	70	71.2	-1.2				
	.00	67	71.2	-4.2				
	1.00	85	71.2	13.8				
	2.00	75	71.2	3.8				
	Total	356						
Employment of Career Counsellor		Observed N	Expected N	Residual	5.236	4	9.488	Accepted
	-2.00	82	71.2	10.8				
	-1.00	64	71.2	-7.2				
	.00	55	71.2	-16.2				
	1.00	86	71.2	14.8				
	2.00	69	71.2	-2.2				
	Total	356						
Participation in Extra-curricular Activities		Observed N	Expected N	Residual	14.692	4	9.488	Rejected
	-2.00	105	133.0	-28.0				
	-1.00	149	133.0	16.0				
	.00	124	133.0	-9.0				
	1.00	161	133.0	28.0				
	2.00	126	133.0	-7.0				
	Total	665						

10. CONCLUSION

Increased demand for technical education has led to the mushroom growth of technical institutes in India letting private sector getting involved in sharing burdens of government. To maintain the quality of education, management requires development of appropriate quality management strategies for the institutes. It has been found that personality development of students plays a major role in maintaining quality of output of the technical institutes. This paper has presented the formulation of strategies for personality development of students studying in technical institutes in India.

The accepted hypotheses were used to formulate strategies for personality development of students studying in the technical institutes. These strategies if implemented suitably will ensure personality development of students, which will finally help the institutes to maintain their quality of output.

REFERENCES

1) Coldeway, A. E. (1989). "Using Basic Statistics in Behavioural Sciences", Prentice-Hall, Scarborough.
2) Gupta, S. C. and Kapoor, V. K. (2002). "Fundamentals of Mathematical Statistics. India" .Sultan Chand & Sons, New Delhi.
3) Kothari, C. R. (2000), "Research Methodology: Methods & Techniques", Wishwa Prakashan, New Delhi.
4) Kumari, Anamika. (2010). "Development Of Quality Management Strategies For Technical Institutes in India- A Study of Select Technical Institutes" Unpublished Doctor of Philosophy in Applied Mathematics, ISM, Dhanbad, May 2010.
5) Malhotra, N.K. (2001), "Marketing Research-An Applied Orientation", 3rd edition, Pearson Education Asia Publication, India.p-282-287.
6) Prasad, G. and Bhar, C. (2010),, "Accreditation system for technical education programmes in India: A critical review", European Journal of Engineering Education, Vol. 35, No. 2, pp.187-213, May 2010.