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Teaching effectiveness and academic environment in the Government Polytechnics of Assam

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ABSTRACT

Teaching effectiveness and academic environment are the two important variables that determine the quality of student output from any institution. There are large-scale variations among the polytechnics in w.r.t. teaching effectiveness and academic environment. Again, there are multiple factors that affect teaching effectiveness. The factors are related to students, teachers, teaching-learning, and the academic environment of the institution. The academic environment includes the dimensions: institutional resources and facilities, involvement of students in teaching-learning, organization of scheduled activities, interaction with faculty and other staff etc. The author carried out a study to find out any differences in teaching effectiveness and academic environment in the polytechnics of Assam. The sample of the study was final year students studying in different Government polytechnics of Assam. In the study, a total of nine Government polytechnics were targeted and a total of nineteen branches were selected by taking 50% of the total branches of each institute subject to the inclusion of at-least two branches from each institute. Fifteen final semester students were randomly selected from each branch hence, a total of 285 (two hundred eighty-five) students were included in the study. Students Evaluation of Educational Quality (SEEQ) and Academic Environment Scale (AES) tools were used for collecting the data. The study reveals that there are significant differences among the various Govt. polytechnics of Assam with respect to various dimensions of teaching effectiveness and academic environment. It was also observed that most of the dimensions of teaching effectiveness and academic environment of Assam Textile Institute had a significantly higher rating than other polytechnics wherever significant differences were observed.

Keywords: *Teaching effectiveness, Academic Environment, Students Evaluation of Educational Quality (SEEQ), Academic Environment Scale (AES).*

1. INTRODUCTION

Polytechnic education in India backs significantly to its social and economic development. The polytechnics in different states of India provides three years' diploma in various disciplines such as Civil, Electrical, Mechanical, Electronics, Computer Science, Medical Lab technology, Hospital Engineering, Architectural, Leather Technology, Textile Technology, and Printing Technology etc. under All India Council for Technical Education (AICTE), India. The aim of the polytechnic education is to create a pool of skill based manpower to support shop floor and field operations as a middle level link between technicians and engineers (Goel, 2009). That means the technicians job requires a level of scientific and technical knowledge and information higher than those of a craftsman or an operator but lower than those of a professional engineer or technologist. The diploma students can perform and manage the shop-floor operational works by virtue of their special skills in reading and interpreting drawings, supervisions, machine operation and maintenance, testing work etc.

In Assam, all the polytechnics are under the administrative control of Directorate of Technical Education (DTE), Assam and run by the State Govt. The students are admitted in the polytechnic based on the merit list prepared through "Polytechnic Admission Test" (PAT). It is observed that the PAT qualified candidates are preferred to take admission in the particular institutions like Assam Engineering Institute and H.R.H. Prince of Wales. There may be several reasons for such preference of an institution by the student. The reasons may include- better academic environment, teaching-learning processes, competent faculty, adequate physical and instructional resources, and better acceptability of the passed out students by the employers.

Teaching Effectiveness and Academic Environment

Teaching effectiveness and academic environment are the two important variables which determine the quality of output from any institution.

Effectiveness in general refers to producing a desired or intended results in successful manner. According to Barr (1952) 'Teaching effectiveness may be essentially a relationship between teachers, pupils and other persons concerned with the educational undertaking, all effected by limiting and facilitating aspects of immediate situation'. There are multiple factors which affect the teaching effectiveness. The factors are related to students, teachers, teaching-learning and academic environment of the institution. The academic environment means the academic atmosphere in the institution or college. The academic environment includes the dimensions: institutional resources and facilities, involvement of students in teaching-learning, organization of scheduled activities, interaction with faculty, and other staff, student involvement in community services and other activities for wholesome personality, academic challenge to students and fair dealings with students. It is also observed that the components of academic environment are related to the dimensions used in evaluating teaching effectiveness by student evaluation in educational quality (Entwistle, 1987). There are large scale variations among the polytechnic w.r.t. teaching effectiveness and academic environment on the above cited aspects. Till date no such study has been undertaken in the polytechnics of Assam. Thus, in the present study, an attempt has been made to study the teaching effectiveness and academic environment of the polytechnics of Assam with a hope to provide useful information to the teachers and administrators which may help them to bring improvement in the teaching effectiveness and academic environment of the polytechnics of Assam.

2. DESIGN OF THE STUDY

The study aimed at determining the current status of the teaching effectiveness and academic environments of the different polytechnics of Assam and to provide some suggestions for optimal learning and conducive environment to the students. Descriptive method of research (survey research) was used in undertaking the study.

3. SAMPLE OF THE STUDY

The study was targeted at the final semester students in government owned polytechnics, namely, Assam Engineering Institute (AEI), Assam Textile Institute (ATI), Bongaigaon Polytechnic (BP), Dibrugarh Polytechnic (DP), PCPS Girls' Polytechnic (GP), H.R.H. The Prince of Wales Institute of Engineering & Technology (POW), Residential Girls' Polytechnic (RGP), and Silchar Polytechnic (SP), in the states of Assam. A total of nineteen branches were selected by taking 50% of the total branches of each institute subject to at-least two branches from each institute. Fifteen final semester students were randomly selected from each branch from each institute hence, a total of 285 (two hundred eighty-five) students were included in the study.

4. TOOLS USED

The following tools were used for collecting the data: Students Evaluation of Educational Quality (SEEQ) and Academic Environment Scale (AES). The SEEQ tool developed by W. Marsh (1982) comprises 33 standardized questions and grouped into nine dimensions of teaching, namely- Learning (Questions 1-4), Enthusiasm (Questions 5-8), Organization (Questions 9-12), Group Interaction (Questions 13-16), Individual Rapport (Questions 17-20), Breadth and Scope (Questions 21-24), Examinations and Grading (Questions 25-27), Assignments (Questions 28-29), Workload and Difficulty (Questions 30-33). The SEEQ tool used for the study were comprised of five-point rating scale questionnaire, namely, very good, good, moderate, poor and very poor. The scores are calculated by assigning 5, 4, 3, 2 & 1 to very good, good, moderate, poor and very poor respectively.

The Academic Environment Scale (AES) was designed by Education & Educational Management Department, National Institute of Technical Teachers' Training and Research, Chandigarh in the year 2008. The scale consists of 60 statements measuring seven dimensions of academic environment, namely- Organisation of scheduled activities (Statements 1.1 – 1.8), Involvement of students in teaching-learning (Statements 2.1 – 2.8), Interaction with faculty and other staff (Statements 3.1 – 3.12), Students involvement in community services and other activities for development of wholesome personality (Statements 4.1 – 4.6), Academic challenge to students (Statements 5.1 – 5.6, Fair dealing with students (Statements 6.1 – 6.6), Institutional resources and facilities (Statements 7.1 – 7.14). This scale uses five-point ratings namely, strongly agree, agree, un-decided, disagree and strongly disagree. The scores are calculated by assigning 5, 4, 3, 2 & 1 to strongly agree, agree, un-decided, disagree and strongly disagree respectively.

5. COLLECTION OF DATA

The questionnaires were administered to the respondents on the spot. The purpose of the study and scale used in the questionnaire was explained before the administration. Students were assured of the complete confidentiality of their opinions. They were requested to respond to the questionnaires anonymously without any fear or favour. Approximately 40-50 minutes were taken by students to rating the two questionnaires.

6. DATA ANALYSIS

The questionnaire rated by the students in respect of "Students' Evaluation of Educational Quality" and "Academic Environment Scale" were scored, tabulated and then subjected to statistical analysis. Descriptive Statistics is used to ascertain the nature of distribution of scores and Inferential Statistics is applied to study the differences among the teaching effectiveness and academic environment of various institutions and branches as measured by SEEQ and AES. Wherever significant F-ratios are found, t-test is used to study the significance of differences between means.

7. RESULTS AND DISCUSSIONS

The findings of the study are discussed below in two major headings, namely, Teaching Effectiveness and Academic Environment.

7.1 Nature of Distribution of various dimensions of Teaching Effectiveness

In order to find out the nature of distribution of scores on nine dimensions of teaching effectiveness, viz., learning, enthusiasm, organization, group interaction, individual rapport, breadth of coverage, examinations, assignments and workload, the values of mean, median, standard deviation, skewness and kurtosis were computed dimension wise.

Table-1: Mean, SD and Sk of Scores on various dimensions of TE

Dimensions	Mean	Median	Standard Deviation (SD)	Skewness (Sk)	Kurtosis
Learning (LER)	4.042	4.10	0.509	-0.506**	0.074
Enthusiasm (ENT)	4.011	4.05	0.564	-0.602**	0.686
Organisation (ORG)	4.036	4.10	0.556	-0.684**	0.748
Group Interaction (GRI)	3.980	4.05	0.650	-0.707**	0.889
Individual Rapport (INR)	3.869	3.90	0.667	-0.756**	1.370
Breadth (BRE)	3.920	4.00	0.645	-0.860**	1.820
Examination (EXA)	3.884	4.00	0.713	-0.858**	1.557
Assignment (ASS)	4.070	4.10	0.692	-0.936**	1.570
Workload (WOL)	3.097	3.10	0.478	-0.152	0.987

Sk Significant 0.01 level = ± 0.374, ** Significant at .01 level

From Table 1, it is evident that mean (M) scores for the various dimensions of teaching effectiveness lie between 3.09 (workload) and 4.06 (assignment). The standard deviation (SD) is found to be minimum in the workload (0.48) and maximum in examination (0.71) dimension. Dispersion of scores around the mean was found to be highest in case of examination. The mean and median for all the dimensions of teaching effectiveness are approximately equal.

The distributions of scores on various dimensions of teaching effectiveness were found to be significantly negatively skewed at 0.01 level except for the dimension of workload (0.15). The results of skewness indicated that there was concentration of scores on the higher end of the curve i.e., most of the students had given high rating to the dimensions of teaching effectiveness except the dimensions of workload. The workload scores were found to be normally distributed.

7.2 One way ANOVA on Dimensions of Teaching Effectiveness

The results of one way ANOVA for nine dimensions of Teaching Effectiveness, namely, learning, enthusiasm, organisation, group interaction, individual rapport, breadth, examinations and grading, assignments and workload and difficulty are given in Table-2.

Table-2: Summary of One way ANOVA for Teaching Effectiveness

Dimensions of TE	Source of Variation	Sum of Squares	df	Mean Square	F
LER	Between Groups	8.770	7	1.253	5.343**
	Within Groups	64.948	277	0.234	
	Total	73.718	284		
ENT	Between Groups	8.204	7	1.172	3.945**
	Within Groups	82.290	277	0.297	
	Total	90.494	284		
ORG	Between Groups	8.434	7	1.205	4.209**
	Within Groups	79.291	277	0.286	
	Total	87.725	284		
GRI	Between Groups	15.785	7	2.255	5.999**
	Within Groups	104.134	277	0.376	
	Total	119.920	284		
INR	Between Groups	14.232	7	2.033	5.029**
	Within Groups	111.989	277	0.404	
	Total	126.221	284		
BRE	Between Groups	17.005	7	2.429	6.649**
	Within Groups	101.204	277	0.365	
	Total	118.209	284		
EXA	Between Groups	10.871	7	1.553	3.218**
	Within Groups	133.661	277	0.483	
	Total	144.532	284		
ASS	Between Groups	7.626	7	1.089	2.351*
	Within Groups	128.327	277	0.463	
	Total	135.952	284		

WOL	Between Groups	4.376	7	0.625	2.861*
	Within Groups	60.526	277	0.219	
	Total	64.901	284		

F - Significant value at .05 level = 2.05, F-Significant value at .01 level = 2.92 (df7, 284)
* Significant at 0.05 level, ** Significant at 0.01 level

All F-values were found to be significant at either at .05 or .01 level. The results indicate that there exist significant differences among the eight polytechnics w.r.t ratings given to nine dimensions of teaching effectiveness. Further t-ratios were calculated for all the dimensions of teaching effectiveness to study the significance of difference between mean scores. The major findings of the study based on t-test results on Teaching Effectiveness are stated dimension wise:

- **Learning:** The students of ATI had significantly higher rating to the dimension of learning than all other polytechnic. RGP & AEI had significantly lower ratings on the dimension of learning than POW, SP, GP & ATI.
- **Enthusiasm:** POW, SP and ATI showed significant higher ratings than RGP and GP on the dimension of enthusiasm. GP also showed significant higher rating on this dimension than AEI.
- **Organisation:** POW, SP & ATI had significantly higher ratings on the dimension of organisation than GP & AEI. RGP also had significantly higher rating than GP. ATI was given significantly higher rating on organisation than RGP & BP. GP was assigned significantly lower rating on this dimension than POW, RGP, SP & ATI.
- **Group Interaction:** Significantly higher rating was given to group interaction in ATI than other six polytechnics, namely, POW, RGP, GP, AEI, BP & DP. The dimension group interaction was rated significantly lower in case of GP than the POW, RGP, SP & ATI.
- **Individual Rapport:** Highest rating on the dimension of individual rapport was given to SP and it was significantly higher than the ratings given to all other polytechnics. Whereas, GP had the lowest rating on individual rapport and significantly lower than POW, SP, ATI, AEI & BP.
- **Breadth of Coverage:** Both SP & ATI had significantly higher rating on the dimension of breadth of coverage than most of the polytechnics, namely, POW, RGP, SP, ATI, AEI & BP.
- **Examination and Grading:** Both SP & ATI had significantly higher rating on examination & grading than the ratings assigned to RGP, GP, AEI & DP.
- **Workload and Difficulty:** Significant differences were observed in the ratings assigned to workload and difficulty between RGP & SP, SP & GP, SP & ATI, SP & BP, SP & DP, POW & ATI and POW & BP. Significantly lower ratings indicating moderate workload and difficulty were observed in case of ATI (M = 2.96) and BP (M= 3.04). Significantly higher workload and difficulty was observed in the case of SP.

7.3 Nature of Distribution of various dimensions of Academic Environment

In order to study the nature of distribution of scores on seven dimensions of academic environment, namely, organization of scheduled activities, involvement of students in teaching-learning, interaction with faculty and other staff, student involvement in community services and other activities for development of wholesome personality, academic challenge to students, fair dealings with students and institutional resources and facilities, the values of mean, median, standard deviation, skewness and kurtosis were computed dimension wise.

Table-3: Mean, SD and Sk of scores on various dimensions of AE

Dimensions	**Mean**	**Median**	**Standard Deviation (SD)**	**Skewness (Sk)**	**Kurtosis**
Organization of Scheduled Activities (OSA)	3.6877	3.875	0.7904	-0.855**	0.312
Involvement of Students In Teaching-Learning (IST)	3.9588	4.000	0.58635	-0.754**	0.537
Interaction with Faculty and Other Staff (IFO)	3.7143	3.8333	0.69317	-0.682**	0.21
Student Involvement in Community Services and other Activities for Development of wholesome Personality (SICS)	3.607	3.6667	0.74611	-0.444**	0.046
Academic Challenge to Students (ACS)	3.5234	3.6667	0.62489	-0.358*	-0.175
Fair Dealing with Students (FDS)	3.6187	3.6667	0.60598	0.020	0.271
Institutional Resources and Facilities (IRF)	3.3905	3.5714	0.84391	-0.617**	-0.16
Total	25.5	26.071	3.88362	-0.612**	0.298

Sk significant at 0.01 level = ± 0.374, Sk significant at 0.05 level = ± 0.287
** Significant at .01 level / * Significant at .05 level

From Table 3 it is evident that mean (M) scores for the various dimensions of academic environment lie between 3.39 (institutional resource facilities) and 3.96 (involvement of student in teaching learning). The standard deviation (SD) is found to be minimum on the involvement of student in teaching learning (0.59) and maximum on the institutional resource facilities (0.84) dimension. Dispersion of scores around the mean was found to be highest in case of institutional resource and facilities (0.84).

7.4 One way ANOVA on Dimensions of Academic Environment

The results of one way ANOVA for seven dimensions of academic environment, namely, Organization of scheduled activities, Involvement of students in teaching-learning, Interaction with faculty and other staff, Student involvement in community services and other activities for development of wholesome personality, Academic challenge to students, Fair dealing with students and institutional resources and facilities are given in Table 4.

Table-4: Summary of One way ANOVA for Academic Environment

Dimensions	Source of Variation	Sum of Squares	df	Mean Square	F
OSA	Between Groups	24.629	7	3.518	6.379**
	Within Groups	152.796	277	0.552	
	Total	177.426	284		
IST	Between Groups	11.946	7	1.707	5.516**
	Within Groups	85.695	277	0.309	
	Total	97.641	284		
IFO	Between Groups	28.119	7	4.017	10.271**
	Within Groups	108.338	277	0.391	
	Total	136.457	284		
SICS	Between Groups	31.954	7	4.565	10.024**
	Within Groups	126.144	277	0.455	
	Total	158.097	284		
ACS	Between Groups	9.535	7	1.362	3.722**
	Within Groups	101.365	277	0.366	
	Total	110.900	284		
FDS	Between Groups	5.1580	7	0.737	2.059*
	Within Groups	99.131	277	0.358	
	Total	104.289	284		
IRF	Between Groups	41.760	7	5.966	10.296**
	Within Groups	160.500	277	0.579	
	Total	202.260	284		
Total AE	Between Groups	767.568	7	109.653	8.639**
	Within Groups	3515.873	277	12.693	
	Total	4283.441	284		

F - Significant value at .05 level = 2.05, F-Significant value at .01 level = 2.92 (df 7, 284)
* Significant at 0.05 level ** Significant at 0.01 level

All F-values were found to be significant at either at .05 or .01 level. The results indicate that there exist significant differences among the eight polytechnics w.r.t ratings given to seven dimensions of academic environment. Further t-ratios were calculated for all the dimensions of academic environment to study which two means differ significantly. The results of significance of differences between mean scores for all the dimensions of academic environments and total academic environments are analysed and the major findings of the study of academic environment are stated dimension wise:

Organisation Scheduled Activities: The academic environment with respect to organisation scheduled activities was found to be significantly better in SP & ATI than the polytechnics, namely RGP, GP & DP. ATI had significant differences on the dimension with POW. GP had the lowest rating on the dimension of schedule activities and had significantly lower ratings than POW, SP, ATI, AEI & BP.

Involvement of Students in Teaching Learning: The highest mean rating on the dimension of involvement of students in teaching learning was given to ATI and it was significantly higher than POW, RGP, SP, GP, AEI and DP. Significantly lower rating was assigned to DP than POW, SP, ATI, AEI & BP.

Interaction with Faculty and Other Stuff: On the dimension of interaction with faculty and other staff ATI had significantly higher rating than all other polytechnics and DP had significantly lower rating than the ratings assigned to POW, RGP, SP ATI, AEI and BP.

Students Involvement in Community Services and other Activities for Development of Wholesome Personality: ATI had significantly higher rating on the dimension of Students involvement in community services and other activities for development of wholesome personality than the ratings assigned to all other polytechnics. DP was accorded significantly lower rating on Students involvement in community services and other activities for development of wholesome personality dimensions than POW, RGP and GP.

Academic Challenge to Students: Both ATI and BP had significantly higher rating on Academic challenge to students than the ratings assigned to POW, RGP, SP and DP. RGP had the lowest rating and significantly lower than the ratings of ATI, AEI and BP.

Fair Dealing with Students: On the dimension fair dealing with students significantly higher rating assigned to SP than the ratings assigned to POW, GP and DP. Significantly lower rating was assigned to GP than ATI.

Institutional Resources and Facilities: Both ATI and BP had significantly higher ratings on the dimension on Institutional resources and facilities than the ratings assigned to POW, RGP, SP, GP, AEI and DP.

8 CONCLUSIONS

The following conclusions are inferred after analysing the data:

Teaching Effectiveness

The distributions of scores on various dimensions of teaching effectiveness were found to be significantly negatively skewed at 0.01 level except for the dimension of workload (0.15). The results of skewness indicated that there was concentration of scores on the higher end i.e., most of the students had given high rating to the dimensions of teaching effectiveness except the dimensions of workload. The workload scores were found to be normally distributed. All F-values were found to be significant at either at .05 or .01 level. The results indicate that there exist significant differences among the eight polytechnics w.r.t ratings given to nine dimensions of teaching effectiveness. Thus, it was concluded that there are significant differences among the various polytechnics of Assam with respect to various dimensions of teaching effectiveness. It was also observed that on most of the dimension of teaching effectiveness ATI had significantly higher rating than other polytechnics wherever significant differences were observed.

Academic Environment

The distributions of scores on various dimensions of academic environment were found to be significantly negatively skewed. The skewness values on various dimensions of academic environment were found to be significant at 0.01/0.05 level. All distribution of scores were found to be negatively skewed except for the dimension of fair dealing with students (0.02). All F-values were found to be significant at either at .05 or .01 level. The results indicate that there exist significant differences among the eight polytechnics w.r.t ratings given to seven dimensions of academic environment. Further, it was also observed that ATI had significantly higher ratings than other polytechnic as per as overall academic environment is concern. GP had significantly lower rating on overall academic environment than POW, SP, ATI, AEI & BP.

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