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Survey Of Attributes To Measure Teaching Effectiveness- An Interdepartmental Analysis

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ABSTRACT

This research examines to measure four attributes of teaching effectiveness. The objective of this study is to evaluate the level of teaching effectiveness attributes and to compare the interdepartmental teaching effectiveness. 96 teachers from an engineering college in Ernakulam district, Kerala has participated in the study. The study revealed that there is a lack of team effort, teaching efficiency, and class room behavior. The teaching effectiveness of the engineering teachers is found to be medium. The study highlights those teaching attributes to be enhanced and suggestive measures are also mentioned to improve the performance of teachers and thereby increase the quality of education and students.

Keywords : communication, team effort, class room behavior, teaching efficiency

Introduction

Evaluating teachers can be approached from three different angles; measurement of inputs, processes and outputs. Inputs are what a teacher brings in to his position like teacher background, beliefs, experience, and knowledge. Processes refer to the interaction that occurs in a class room between teachers and students. Outputs represent the result of class room processes such as impact on student achievement, graduation rates, student behavior and attitude. Teacher effectiveness is the impact that class room factors such as teaching methods, teacher expectations, class room organization and use of class room resources have on student's performance (Campell et al, 2004).

Statement of the problem

There is a rapid growth in the body of research that examines differences in teachers' effectiveness and raising student achievement. The effectiveness and efficiency of a teacher in higher education institution is measured based on the results achieved in university results. The contribution of the teachers has a positive impact on the results and the quality of education. The University result of the sample college taken for the study has decreased for the last few years. The study is therefore focused to measure the comparative teaching efficiency of the teachers.

Literature review

Students' ratings should be only one of several forms of evaluation used to shed light on teaching effectiveness. Peer review, self-evaluation, teaching portfolios, and student achievement as examples should also be used (Seldin, 1999; Doyle, 1983; Centra, 1993). Research indicates that instructors benefit most from formative evaluation to improve teaching when they have helped to shape the questions posed, when they understand the feedback that is provided, and when assistance and resources for making improvements are available (Gaubatz, 2000). Institutions must carefully define those areas in which students are capable of giving feedback to faculty and those that are beyond their expertise (Ory, 2001).

Objectives of the study

The objectives of the study are as follows;

1. To assess the level of teaching effectiveness attributes across departments.

2. To explore the attribute of teaching effectiveness that is more consistent and reliable.

3. To measure the equality of means among the teaching effectiveness attributes in the college.

Methodology of the study

The study was conducted at one of the self-financing engineering colleges in Ernakulam district, Kerala State, during the academic period of 2011-2012 to identify the overall performance of the teaching fraternity of the institute. The interdepartmental effectiveness was measured by using four attributes like (1) communication, (2) team effort, (3) class-room behaviour, and (4) teaching efficiency. Data pertaining to various attributes were collected through questionnaire which was distributed to teaching faculty members across seven departments. Data was collected from 96 teachers of all the departments in the college. Hypothesis testing is done with the help of Chi-square and the level of the attributes are measured as low, medium and high by using Average ± S.D. Anova is used to identify the equality of means among the attributes.

Results

Table 1 Overall performance level of teachers

Factors and levels	Low	Medium	High	Total
Communication	8 (8%)	73 (76%)	15 (16%)	96
Team effort	16 (17%)	74 (77%)	6 (6%)	96
Class room behaviour	13 (13.5%)	69 (72%)	14 (14.5%)	96
Teaching efficiency	13 (13.5%)	70 (73%)	13 (13.5%)	96

Among the above four variables it is clear that team effort is the lowest (6%) and it a major factor that is lacking among the teachers of this engineering college. When compared among the entire variable the high levels of each factors is insignificantly low with communication (16%), team effort (6%), class room behaviour (14.5%) and teaching efficiency (13.5%). Majority of teachers have only medium level of communication, team effort, class room behaviour and teaching efficiency. Hence there should be an overall improvement in these factors for increasing the teaching efficiency and performance of teaching community.

It is clear also that level of communication is high (16%) compared with other variables. Hence the following hypothesis

is framed and tested. Ho: Communication is the prominent teaching attribute among the teachers compared with other factors. The calculated value of c2 (7.04) is less than the table value (12.59) at 5% confidence level with 6 degrees of freedom. Hence the null hypothesis is accepted and it is concluded that communication is the most important teaching attribute among the teachers.

The level of communication among the teachers is high (16%) compared with the other attributes. 77% of the teachers exhibit a medium level of team effort which is greater than the other variables. 17% of the teachers have a low level of team effort which is also greater compared with other teaching attributes. To identify whether equality of means exists among the various factors, the following hypothesis is framed and tested. Ho: There is no equality among the means of teaching attributes of the teachers.

Table 2 Anova table showing the difference in teaching attributes

Source of variation	Sum of squares	Degrees of freedom	Mean square	F ratio 4681 = 421.33 11.11
Between group	9362	2 (k-1)	4681	
Within group	100	9 (n-k)	11.11	
Total	9462	11 (n-1)		

The calculated value of F ratio is greater than the table value (F2, 9 = 4.26) (α = 0.05) and hence the hypothesis is rejected. Thus it is proved that there is a relationship and equality among the means of the various teaching attributes.

Table 3 Civil Engineering department

Factors and levels	Low	Medium	High	Total
Communication	2 (14%)	11 (79%)	1 (7%)	14
Team effort	10 (71.5%)	3 (21.5%)	1 (7%)	14
Class room behaviour	0	13 (93%)	1 (7%)	14
Teaching efficiency	2 (14%)	11 (79%)	1 (7%)	14

Only 7% of the civil engineering staff members exhibit high level of communication, team effort, class room behaviour and teaching efficiency. Alarmingly, the level of team effort is very low (71.5%). The communication of teachers, class room behaviour and teaching efficiency of Civil Engineering staff members are lower compared to the overall score of the college. Ho: All the teaching factors in Civil Engineering department are the same. The calculated value of c2 (23.06) is greater than the table value (12.59) at 5% confidence level with 6 degrees of freedom. Hence the null hypothesis is rejected and it is concluded that the teaching factors among the civil engineering staff members are different.

Table 4 Mechanical Engineering department

Factors and levels	Low	Medium	High	Total
Communication	1 (6.5%)	13 (87%)	1 (6.5%)	15
Team effort	1 (6.5%)	13 (87%)	1 (6.5%)	15
Class room behaviour	1 (7%)	11 (73%)	3 (20%)	15
Teaching efficiency	3 (20%)	10 (67%)	2 (13%)	15

Among the four variables exhibited above, in Mechanical department, 20% of the teachers exhibit high level of class room behaviour, which is comparatively better than the overall average (14.5%). Comparing the above attributes with the overall score, it is found that communication is lacking among the faculties in this department. Ho: Class room behavior of teachers is high in mechanical department than other factors. The calculated value of c2 (4.14) is less than the table value (12.59) at 5% confidence level with 6 degrees of freedom. Hence the null hypothesis is accepted and it is concluded that teachers in Mechanical engineering department have better class behavior compared with other factors.

Table 5 Electrical Engineering department

Factors and levels	Low	Medium	High	Total
Communication	2 (20%)	4 (40%)	4 (40%)	10
Team effort	2 (20%)	8 (80%)	0	10
Class room behaviour	1 (10%)	8 (80%)	1 (10%)	10
Teaching efficiency	1 (10%)	9 (90%)	0	10

Compared with other departments, the staff members in Electrical Engineering department have high level of communication (40%) which is much greater than the overall score (16%). At the same time, the team effort of staff members and their teaching efficiency is medium. Attention should be given to these two factors in this department. Class room behaviour (10%) of teachers in Electrical Engineering department is also less than the overall average (14.5%). Ho: Communication is the prominent teaching attribute among the electrical engineering teachers. The calculated value of c2 (11.30) is less than the table value (12.59) at 5% confidence level with 6 degrees of freedom. Hence the null hypothesis is accepted and it is concluded that communication is the most important teaching attribute among the electrical engineering teachers.

Table 6 Electronics Engineering Department

Factors and levels	Low	Medium	High	Total
Communication	3 (15%)	15 (75%)	2 (10%)	20
Team effort	2 (10%)	17 (85%)	1 (5%)	20
Class room behaviour	8 (40%)	12 (60%)	0	20
Teaching efficiency	4 (20%)	14 (70%)	2 (10%)	20

In Electronics department, communication and team effort and teaching efficiency are much less compared with the respective overall score. None of the teachers exhibit a high level of classroom behaviour. Ho: There is a difference in the levels and the teaching attributes by the electronics engineering teachers. The calculated value of c2 (7.97) is less than the table value (12.59) at 5% confidence level with 6 degrees of freedom. Hence the null hypothesis is accepted and it is concluded that there is a difference among the teaching factors. It can be stated that the class room behaviour of the teachers in this department is very poor.

Table 7 Computer Science Engineering

Factors and levels	Low	Medium	High	Total
Communication	0	10 (71%)	4 (29%)	14
Team effort	0	12 (86%)	2 (14%)	14
Class room behaviour	1 (7%)	11 (79%)	2 (14%)	14
Teaching efficiency	0	7 (50%)	7 (50%)	14

The staff members in computer science department performs comparatively better than other departments in the above four parameters- communication, team effort, class room behaviour and teaching efficiency. The levels of all these four factors are comparatively higher than the overall average of the college. The level of teaching efficiency of Computer Science department is high (50%) which is much higher than the overall average (13.5%). Ho: Teaching efficiency is the prominent teaching attribute in computer engineering department. The calculated value of c2 (8.87) is less than the table value (12.59) at 5% confidence level with 6 degrees of freedom. Hence the null hypothesis is accepted and it is concluded that teaching efficiency is the most important teaching attribute among the computer engineering teachers.

Table 8 Information Technology department

Factors and levels	Low	Medium	High	Total
Communication	2 (17%)	7 (58%)	3 (25%)	12
Team effort	1 (8.5%)	10 (83%)	1 (8.5%)	12
Class room behaviour	2 (17%)	9 (75%)	1 (8%)	12
Teaching efficiency	1 (8%)	10 (84)	1 (8%)	12

In Information Technology department the communication level (25%) and team effort (8.5%) of the staff members are

higher than the overall average. But the class room behaviour and teaching efficiency is lower than the overall average of the college. Ho: Communication is the prominent teaching attribute among the Information Technology teachers. The calculated value of c_2 (3.33) is less than the table value (12.59) at 5% confidence level with 6 degrees of freedom. Hence the null hypothesis is accepted and it is concluded that communication is the most important teaching attribute among the Information Technology engineering teachers.

Table 9 Science Department

Factors and levels	Low	Medium	High	Total
Communication	0	11 (100%)	0	11
Team effort	0	11 (100%)	0	11
Class room behaviour	0	5 (45%)	6 (55%)	11
Teaching efficiency	2 (18%)	9 (82%)	0	11

From the above table, it is clear that the communication and team effort of the staff members of science department are medium. 55% of the staff members of Science department exhibit high level of class room behaviour which is more than the overall average (14.5%). When compared with the high level of these factors, the teachers in this department are poor in communication, team effort and teaching efficiency. Ho: Classroom behaviour is the prominent teaching attribute among the science teachers. The calculated value of c_2 (26.66) is greater than the table value (12.59) at 5% confidence level with 6 degrees of freedom. Hence the null hypothesis is rejected and it is concluded that there is no difference among the teaching attributes in science department.

Table 10 Coefficient of variation of teaching atributes

Sl No	Teaching attributes	Average	S.D	C.V
1	Communication	4.06	0.40	9.85
2	Team effort	4.26	0.43	10.09
3	Class room behaviour	4.31	0.48	11.13
4	Teaching efficiency	3.89	0.28	7.19

Among the teaching attributes, teachers possess high class room behavior with an average of 4.31. The least attribute is teaching efficiency with a mean of 3.89. The coefficient of variation values further reveals the consistency and reliability of teaching attributes of the teachers. The coefficient of variation is less for teaching efficiency and communication with coefficient values 7.19 and 9.85 respectively. These attributes are highly consistent and reliable among the teachers. The mean of Class room behavior is high but it is least consistent and reliable among the teaching factors with coefficient value of 11.13. This analysis shows that the teachers possess high communication and teaching efficiency but there is a lack of class room behavior and team effort.

Findings of the study
1. All the teaching attributes are medium in the engineering college, but communication of the teachers and class room behavior are better compared with other variables.

2. Teaching efficiency and communication are the two important attributes that are highly consistent and reliable among the teachers.
3. Teaching efficiency and team effort are the two important factors that are lacked by the teachers in the engineering colleges. An improvement in these attribute will help to increase the performance and quality of the students.
4. The levels of teaching attributes revealed that 16% of the teachers show high level of communication, team effort (6%), class room behaviour (14.5%) and teaching efficiency (13.5%). Majority of teachers have only medium level of communication, team effort, class room behaviour and teaching efficiency. These are the leading indicators for engineering colleges to improve the teaching effectiveness in future.
5. There is a relationship and equality among the means of the various teaching attributes. The attributes of communication, team effort, class room behavior, teaching efficiency are interrelated in improving the teaching effectiveness.

Conclusion
The result of this study leaves scope for future research in many directions of teaching effectiveness. A high level of the four variables; communication, team effort, class room behavior and teaching efficiency used in this study definitely increases the teaching effectiveness. This research is an eye opener for many self financing engineering institutes to effectively utilize their teacher resources. Teachers need to be assured that ratings are a formative method of evaluation and that assistance to improve their teaching will be made available to them. The authors do not claim this as the single best measure to provide sufficient information in teaching effectiveness. Hence multiple measures to measure different aspects of teaching effectiveness must be employed.

Recommendations
1. Design appropriate strategies to improve the level of instruction in class rooms.
2. Improve human resource practices that include teacher recruitment and induction, professional development activities, communication of expectations for teacher performance, specifications of class room teaching strategies, provision of encouragement and incentives, and removal of poorly performing teachers.
3. The management can also initiate to conduct interdepartmental competitions annually for the teachers that help to improve their team effort and coordination.
4. Choose an individualized approach to improve instruction, allowing teachers to plan their own professional growth.
5. Permit considerable flexibility for teachers to decide how they will improve instruction.
6. In collaboration with Principal and heads, teachers can create a plan for professional development including taking courses that will address the gaps in their knowledge.
7. Teachers and their supervisors can use evaluation results from class room observations and student achievement gains to help them determine areas that need to be addressed.

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