



Analysis of Students' Feedback in a Faculty Award System

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Introduction

The ABET report 'Engineering Change: A Study of the Impact of EC2000' refers to the Criteria for Accrediting Engineering Programs, which states that the teaching faculty is the heart of any educational program¹. We contend that the motivation and quality of faculty members is the most critical success factor for an educational institute. It also significantly influences the other success factors - student intake and infrastructure. Furthermore, the faculty is an active and more stable factor and requires more attention. Therefore, administrators need to pursue various organizational and managerial techniques to keep the faculty at their best motivation level.

A properly designed award system could help to improve the motivation of faculty members. There are two types of motivations: intrinsic and extrinsic. A faculty member is said to be intrinsically motivated if there is no apparent reward other than the activity itself or the satisfaction which results from the activity². While such faculty members do not require external awards for their motivation, they are far fewer in number. We argue that majority of the faculty members move up the ladder of motivation only when they receive external rewards. We verified this premise by conducting a survey of 22 faculty members at a workshop on engineering education. We asked them to rate the statement, 'A proper reward and recognition system must be developed at colleges' on the Likert scale of 1 to 5 and received the rating of 4.54, which underlines the desperate need for an award system. Richardson, et al. conducted a study to find the factors that influence faculty motivation wherein they spoke to 26 faculty members at a college across ranks, genders and departments. They found that 19 of the faculty members referred to 'Incentives and rewards: Types of external benefits including monetary awards, grants, and release time' as one of the factors³.

We decided that the award system must primarily depend on students' feedback. Michael Johnson, et al. ² state that SETs (student evaluations of teaching effectiveness) are widely used metric to assess effectiveness of teachers. Benton and Cashin⁴ have concluded that SETs are primarily a function of the instructor who teaches a course. They are reliable and stable, do not depend on the course that is taught, are relatively unaffected by a variety of potential biases, and are seen to be useful by faculty, students, and administrators. At the same time, one has to cognize that no single source of information – including student ratings – provides sufficient information to make a valid judgment about an instructor's overall teaching effectiveness. There are several important aspects of teaching that students are not competent to rate.⁴ There are many other dimensions that must be taken into account to judge performance of a faculty member. Some of the examples are, research in education domain, academic initiatives like developing new courses, specifics of the courses taught like such as class size, and other organizational initiatives.

Literature is replete with studies pertaining to student rating of faculty ^{4,5} but is lacking with its use for awards – even though such schemes are available at some institutes. We believe that analyzing such schemes and the data emerging from them, can significantly help understand the dynamics of education and improve the performance of faculty.

The major contribution of this paper is in analyzing student rating used in an award system. It brings out the fact that poor performers tend not to participate in such polls and the faculty appears to be not doing very well on student centeredness factor as compared to other factors. The short list prepared based on the poll had better representation of female and PhD teachers i.e. percentage of female and Ph D teachers in the short list were higher than percentage of female and Ph D teachers in the total faculty population. We also noticed that male teachers are rated better on knowledge and devotion factors.

The paper explains the award system, dwells on the factors and process used in the student poll and analyses its result. It ends with concluding remarks.

Award System

At our college - College of Engineering, Pune - we have come across many splendid performers amongst faculty members but not any formal recognition programs. We seem to largely rely on self-motivation for better performances which is not very common and posited that we require an award system. We validated our assumption by carrying out a survey of a heterogeneous group of 22 faculty members and designed an award system.

The system is based on two unequivocal findings that have stemmed from years of research in the area. They are 1). Student ratings are the most reliable and valid method of measuring teachers' effectiveness. 2). The ratings are only one source of data and must be used in combination with multiple sources of information if one wishes to make a judgment about teaching.^{4,5}

Student Poll

This section describes the method that we adopted for polling students. There probably are more studies of student ratings than all of the other data used to evaluate college teaching combined⁴. In general, student ratings tend to be statistically reliable, valid, and relatively free from bias or the need for control, perhaps more so than any other data used for faculty evaluation⁴. Benton and Cashin⁴ also quote McKeachie who argued that, when it comes to personnel decisions, student ratings of attainment of educational goals and objectives are preferable to many other dimensions. Benton and Cashin⁴ have also found that multiple classes provide more reliable results and average split half reliability - even for 10-14 student size - is as high as 0.78. The multi-section studies show that classes in which the students gave the instructor higher ratings tended to be the ones where the students learned more (i.e., scored higher on the external exam)⁴. Based on the above, we accorded the highest score of 50 % to student ratings in our award system.

Factors

Centra, Braskamp and Ory⁴ have identified six factors commonly found in student-rating forms: 1. course organization and planning; 2. clarity, communication skills; 3. teacher student interaction, rapport; 4. course difficulty, workload; 5. grading and examinations; and 6. student self-rated learning. Hoyt and Lee⁴ reported five dimensions of teaching based on

IDEA Diagnostic Form Items 1 to 20: 1) providing a clear classroom structure, 2) stimulating student interest, 3) stimulating student effort, 4) involving students, and 5) student interaction. Marsh's Students' Evaluations of Educational Quality (SEEQ) form⁴ has nine dimensions: learning/value, enthusiasm, organization, group interaction, individual rapport, breadth of coverage, examinations/grades, assignments, and workload. Other student-rating instruments have items measuring some or all of the above dimensions.

Bases on these prior studies, we developed our award system that sought the three best teachers from students. We chose students who had spent at least one year at the college. We also asked them to rate those three teachers on knowledge, delivery, student centeredness, devotion and discipline on a 1-5 Likert scale as defined in the table 1 below;

Factor	Definition
Knowledge	The teacher has all round and complete knowledge - Not only in his subject area but also beyond.
Delivery	The teacher uses various means very effectively to impart his / her knowledge.
Discipline	The teacher has a very high degree of self-discipline.
Student Centeredness	Students go to this teacher whenever they come across any technical or non-technical problem.
Devotion	The teacher has the highest devotion / passion for the teaching profession.

Table 1: Factors and their definition

Course organization and planning, clarity, communication skills, providing a clear classroom structure group interaction / stimulating student effort involving students are covered in delivery and to some extent in discipline. Teacher student interaction, individual rapport; stimulating student interest and student interaction are covered in Student Centeredness. While enthusiasm is covered in devotion, breadth of coverage reflects in knowledge. We did not explicitly include grading and examinations but believe that they (grading and examination) may have impacted rating of Student Centeredness. We did not use student self-rated learning, assignments, course difficulty and workload as that could vary based on the courses taught by the same faculty.

Process

We formed an award committee consisting of the head of the college, his deputy, and the head of the Innovation Centre. The committee deliberated all the aspects of the award process and ran it by all the deans and department heads. Their feedback was taken into account to baseline the system.

The baseline system was announced to all 2879 eligible students over email to seek an ordered list of three best teachers from amongst 251 teachers along with a comment for each nomination and a comment about the overall award system. We chose online polling over Moodle. Online delivery offers several advantages over paper-and-pencil administration. Students can respond outside of class at their convenience, freeing class time for other activities⁴. Response rates to open-ended questions posted online tend to be higher and written comments lengthier⁴. Moreover, online directions and procedures can be uniform for

all classes, enabling instructors to be less involved in the administration process⁴. The chief disadvantage of online ratings is lower student response rates to the fixed items, which threaten class representation. Lower response rates occur for several reasons. Among them student concern about anonymity, difficulties in using computers, and the time required outside of class to respond appear to impact the most⁴.

We ensured student confidentiality and asked only for department and enrollment year information to allow us to monitor responses by class. We also announced an award for the class providing the maximum response to increase the % polling. A special meeting of all the student leaders - Class Representatives (CRs) - was called to explain the system, and they were requested to relay the message to all students. We received response from 511 students in 3 weeks. We conducted another meeting with the Class Representatives (CRs) that took the count to 673 resulting in overall yield of 23 %. We monitored response rates on continuous basis and informally encouraged students to participate in the process.

The details of the voting summary are given in table 2. There are three reasons for lower yield; 1. The system was seeking the best three teachers and some students were probably unhappy to choose any one. Some students chose only one or two teachers. 2. There was apathy about faculty evaluation programs –in general - as some students perceived that it is not acted on. 3. We used an online system which some students were not comfortable with.

Voting Summary													
	S B Tech	Y B Tech	T B Tech	Y B Tech	Final B Tech	Final M Tech	Total	Avail able UG Votes	% UG Votes	Availab le PG Votes	% PG Votes	Total Avail able Votes	Total %
Civil	6	28	3	13	50	248	15%	107	12%	355	14%		
Computer & IT	65	88	64	6	223	517	42%	18	33%	535	42%		
Electrical	19	7	5	29	60	255	12%	38	76%	293	20%		
E & TC	13	31	14	22	80	264	22%	75	29%	339	24%		
Instrumentation	18	11	7	19	55	129	28%	36	53%	165	33%		
Mechanical	23	32	8	6	69	528	12%	56	11%	584	12%		
Metallurgy	22	20	20	30	92	240	26%	44	68%	284	32%		
Production	3	5	16	20	44	252	10%	72	28%	324	14%		
Year wise Total Votes	169	222	137	145	673	2433	22%	446	33%	2879	23%		
Year wise Available Votes	784	780	869	446	2879							2879	
Year wise % Votes	22%	28%	16%	33%	23%								

Table 2: Voting Summary.

We decided to choose approximately the top 10 % teachers from each department to realize a short list of 25 teachers.

There were four emeritus faculty members in the list. They proposed their withdrawal from the process so that the younger and regular faculty members receive awards. We also had two regular faculty members who opined that they do not need such extrinsic motivation and requested their withdrawal from the process. We honored views of all the six faculty members that reduced the short list to 19 faculty members.

Other factors

Since the student ratings are only one source of data and must be used in combination with multiple sources of information if one wishes to make a judgment about faculty, we researched and decided to use additional factors like teaching plans, research in the area of education, developing new courses, redesigning old ones, guiding UG, PG and research scholars, helping other colleagues, teaching electives versus core courses, involvement in any other organizational activities, and results of interview with the award committee.

The top three awards and a special jury awards were announced over email to the entire college community. The awards carry cash component, a memento and a certificate. We have not planned any explicit linking of these awards with annual appraisal process; however, we do expect that the award winners will have a distinct advantage in the appraisal process. We have appealed to all the faculty members to discuss better practices that the short listed teachers have been following. We also have proposed to start a regular weekly digest to highlight the better practices and other education methodology material.

Result

The section examines overall ratings as well as the results with respect to profile of participants in the poll and correlation between overall and factor-wise rating between PhD and non PhD, and male and female teachers.

Overall Ratings

One way stacked ANOVA (Tukey Method) of Minitab Version 16 was used to find out grouping between different factors of student poll (Table 3). As per Tukey's method, the factors that do not share a letter are significantly different. It is interesting to note that student-centeredness has received the least rating as compared to the other factors. This could be due to heavier expectations from faculty by the students.

Factor	N	Mean	Grouping
Devotion	25	4.5543	A
knowledge	25	4.5467	A
Discipline	25	4.4649	A
Delivery	25	4.4340	A
Student Centeredness	25	4.1474	B

Table 3: Grouping Information Using Tukey Method

Participants

We analyzed the academic performance of students who voted in the poll. The two sample T test (using Minitab version 16) for both SGPA (Semester Grade Point Average) and CGPA (Cumulative Grade Point Average) indicated that the responding students had better academic performance than the entire student contingent.

Davis has concluded that there is little or no relationship between student ratings and GPA based on various studies performed by different researchers⁴. We did not find any reported research on participation of students in the survey based on their academic performance. It seems that poor performers don't participate in such surveys thus impairing the survey results.

Gender of Teacher

We studied the short list of teachers and found contribution of female teachers to the list to be 40 % although we have only 30.4 % female faculty teachers. We also compared rating on the five factors between male and female teachers resulting in the following table;

	Knowledge	Delivery	Discipline	Student Centeredness	Devotion
Female Average	4.4	4.4	4.4	4.1	4.4
Male Average	4.6	4.4	4.5	4.1	4.6

Table 4: Rating by Gender of teachers

The two sample T test indicated statistically significant difference in knowledge and devotion for male faculty members (p value for knowledge was 0.1 and for devotion 0.09).

Literature reports slightly higher rating for women faculty on student-centeredness – but not an overall high rating⁴. We did not find any gender based difference on student-centeredness but found proportionately more female faculty members making it to the short list. The female faculty members fared much better, even though; the male ratio in the 2879 eligible student was 70 %. We found male faculty's rating to be statistically different (higher) on knowledge and devotion. This could be because of some emeritus faculty members – all of them being males – having very high ratings on those attributes. We did not capture the voting pattern based on the gender. That may have been helpful for doing further analysis.

PhD and non PhD Teacher

We studied the short list of the teachers and found contribution of the PhD teachers to the list to be 40 % although we have only 32 % PhD faculty teachers. We also compared ratings on the five factors between PhD and non-PhD teachers resulting in the following table;

	Knowledge	Delivery	Discipline	Student Centeredness	Devotion
Non PhD	4.5	4.4	4.4	4.1	4.5
PhD	4.6	4.5	4.5	4.1	4.6

Table 5: Rating by PhD teachers

The two sample T test indicated no statistically significant difference in any of the five dimensions. The fact that there is better representation of the PhD Teachers in the short list may have to do more with their experience than having PhD degree.

Concluding Remarks

The greatest asset of an educational institute is its faculty which requires a great deal of nurturing. This is more pertinent in engineering education due to the significant shortage of faculty members with a very few of them having intrinsic motivation. A properly designed and implemented award system can be of great help towards that objective. The award system has to hinge on ratings given by students that can be analyzed to understand the dynamics of the educational processes at play.

We designed an award system and analyzed the student feedback data. We found that students rated faculty less on student centeredness than on other factors. We also found that academically poor performers' participation in the poll was significantly lower. While doctorate teachers' representation in the short list was better, they did not fare better on any of the five factors. Female teachers had better representation in the short list but were found lacking on knowledge and devotion factors as compared to the male teachers.

An award process is a human process and therefore cannot be perfect. While majority of the faculty members welcomed the initiative, there were some detractors. While a few of them believed that the faculty members should have intrinsic motivation and need not require such award system, some others felt that the award system is not completely fair. It provided undue advantage to teachers who teach junior classes, they felt.

The study can be extended in many ways. The process is just the first step and will evolve into a better one. While we can perform more analysis and repeat the experience over years, the most important extension would be to use the data to develop a performance improvement plan for the faculty, to track the plan and achieve its objectives. The plans need to be made keeping in mind that research indicates that combining consultation with feedback is significantly more useful for bringing in improvements. The earlier study has showed that female faculty members are often rated lower on the knowledge scale even when they are as knowledgeable as their male counterparts. It may be due to the disproportionately higher number of male students. We need to analyze the voting pattern and see if there was any gender bias in voting and explore possible ways of correcting it. The study is performed only at one college and must be repeated at other colleges in different cultural and geographical settings to validate the findings.

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