

MANAGEMENT FACULTY PERFORMANCE EVALUATION WITH SIGNED AND UNSIGNED STUDENT FEEDBACK USING LINEAR REGRESSION TECHNIQUE

Chandrani Singh¹, Arpita Gopal² & Santosh Mishra³

The process of extracting faculty performance from student feedback has become an established approach nowadays since it has been found that faculty performance is very much dependent on Management, Student, Self and Peer feedback. Student feedback being an important component in faculty's performance prediction shows many traits of its own. Some of the traits as identified in our previous papers are as follows:

- Students prioritizing some of the feedback parameters over the others.
- Variation in student behavior while marking on different feedback parameters

The two other traits which have been found while analyzing faculty performance from student feedback are as follows:

- Difference in the marking pattern on implementing the signed and unsigned feedback mechanism.
- Difference in marking pattern between male and female students

This paper deals with the analysis and results of the last two traits and puts forth important findings for the same. The results are generated making use of statistical tools and aims at conveying important conclusions arrived at while assessing faculty performance from student feedback using Regression Technique.

Keywords: Statistical Analysis, Regression, Behavioral Pattern.

1. INTRODUCTION

Evaluation of faculty by students is important for ongoing educational program improvement and to maintain accreditation of the courses. In addition a major portion of career advancement and faculty compensation is directly tied to learners' evaluations of their effectiveness in teaching. Faculty members vary in their views and beliefs about whether their evaluations should be obtained using signed or unsigned feedback. Some faculty members believe that unsigned ratings can be influenced by unfair bias and argue that students should be required to sign their evaluations of faculty members to promote accurate assessments. Others believe that students may not be honest in their evaluations of faculty for fear of retribution if they provide criticism or negative feedback [20]. Consequently, their views are that known evaluators produce inflated evaluation ratings referred to as the "generosity factor" or "halo effect" [17, 18]. In this paper we have considered our Institute's data over six years of which the first three years the feedback taken was through the signed feedback system and the next three years using the unsigned technique. In

both the cases to attach more relevance to the feedback system we have also considered only student attendance and allocated appropriate weights to the feedback in the range of 0 to 1.

2. ANALYSIS USING REGRESSION TECHNIQUE

The snapshot of the data used to conduct the study between the known and the unknown evaluations is given in the Table 1 below. Previous researches show that

- (1) Evaluations in which student identities are known result in higher faculty ratings than unsigned forms.
- (2) Student ratings are higher when forms are completed in the presence of the faculty member being rated.
- (3) Student ratings are higher when the directions indicate that results will be used for personnel decisions, as opposed to use solely by the faculty member for instructional improvement[19].

But the studies were conducted for students pursuing traditional courses and here we have considered student community pursuing management courses where teaching learning structure and methodology is quite different. We have not only considered the signed and unsigned feedback but have also considered the gender bias for the same. Here

^{1,2,3}Sinhgad Institute of Business Administration and Research
Kondhwa (Bk.), Pune-411048, India, Affiliated to University
of Pune, India

E-mail: ¹singh.chandrani@gmail.com, ²arpita.gopal@gmail.com,
³ssantosh.k.mishra@gmail.com

we have also taken into consideration the faculties who have worked in this Institute for a period not less than five years because both the signed and the unsigned approach could be implemented on the same set of faculties to make the study more concrete. The signed evaluations were cumulated semester wise and the unsigned evaluations also followed the same approach. Fifteen parameters were taken into consideration and ratings were in the scale of 5 and 10. Linear regression was used to examine the relationship between faculty members' ratings in signed and unsigned feedback systems.

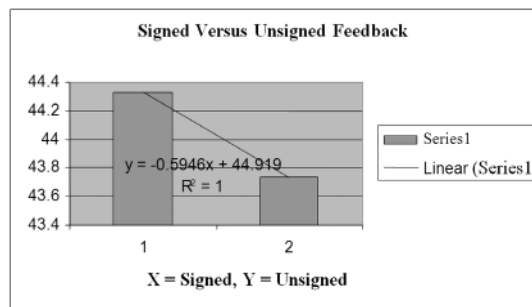


Fig. 1: The Aggregate of the Signed Evaluations Compared to the Unsigned Evaluations of the Same Faculty, with 95% Confidence Interval Bars

Table 1
Snapshot of Student Feedback Data

Pallavi Deshpande	Mini proj WST	0	0	0	0	0	0	0	0	0	Known	SEM 3	Sushil Kadam	M
Pallavi Deshpande	Mini proj WST	0	0	0	0	0	0	0	0	0	Known	SEM 3	Swanand Sathe	M
Pallavi Deshpande	Mini proj WST	7	7	3	3	2	2	5	3	32	Known	SEM 3	Abhinav Agwan	M
Pallavi Deshpande	Mini proj WST	10	10	5	5	5	5	5	5	50	Known	SEM 3	Aniruddha Bhoot	M
Pallavi Deshpande	Mini proj WST	10	10	5	5	5	5	5	5	50	Known	SEM 3	Kaiwalya Wategaonkar	M
Pallavi Deshpande	Mini proj WST	7	6	3	3	3	3	4	4	33	Known	SEM 3	Pankaj Deshpande	M
Pallavi Deshpande	Mini proj WST	10	10	4	4	4	4	4	5	45	Known	SEM 3	Rahul Alkatwar	M
Pallavi Deshpande	Mini proj WST	8	7	3	3	3	4	3	4	35	Known	SEM 3	Rakesh Kanchalwar	M
Pallavi Deshpande	Mini proj WST	10	9	5	4	4	4	4	4	44	Known	SEM 3	Kaustubh Kale	M
Pallavi Deshpande	Mini proj WST	8	9	4	3	3	4	4	3	38	Known	SEM 3	Girish Pmrubhakta	M
Pallavi Deshpande	Mini proj WST	8	9	4	3	3	4	4	3	38	Unknown	SEM 3	Abhijeet Khare	M
Arpita Gopal	DS	10	10	5	5	5	5	5	5	50	Unknown	SEM 2		
Arpita Gopal	DS	9	8	4	5	5	0	5	4	40	Unknown	SEM 2		
Arpita Gopal	DS	10	10	5	5	5	5	5	5	50	Unknown	SEM 2		
Arpita Gopal	DS	10	10	5	5	5	5	5	5	50	Unknown	SEM 2		
Arpita Gopal	DS	10	10	5	5	5	5	5	5	50	Unknown	SEM 2		
Arpita Gopal	DS	10	10	5	5	5	5	5	5	50	Unknown	SEM 2		
Arpita Gopal	DS	10	10	5	5	5	5	5	5	50	Unknown	SEM 2		
Arpita Gopal	DS	10	10	5	5	5	5	5	5	50	Unknown	SEM 2		

The aggregate evaluation score through signed feedback system was 43.70 with 95% Confidence and unsigned was 43.01 with 95% Confidence. Of the 20 faculty members, the mean evaluation score for 15 individuals was lower for unsigned feedback than for signed feedback Examination revealed that faculty evaluation ratings were lower in unsigned systems than the signed systems for all individuals, except five. Five individuals had higher mean scores for unsigned raters than for signed raters. Figure 2 shows the results of regression analysis for ratings in the unsigned system on ratings for the signed system. Results reflect a statistically significant relationship with r value =.33

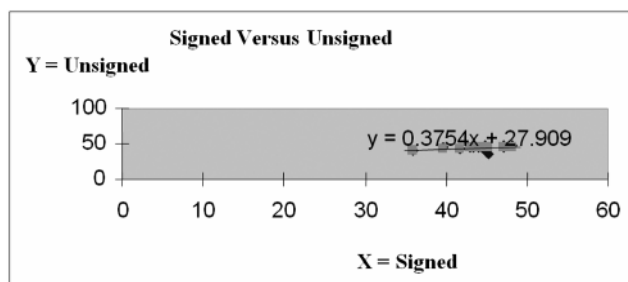


Fig. 2: Signed Versus Unsigned Data Bears a Statistically Significant Relationship with r = .33

Supplemental analysis on the difference in signed versus unsigned feedback, examined the data by gender also wherein certain important revelations were made. Here the same dataset has been considered for the study. The average feedback received gender wise is shown in Figure 3.

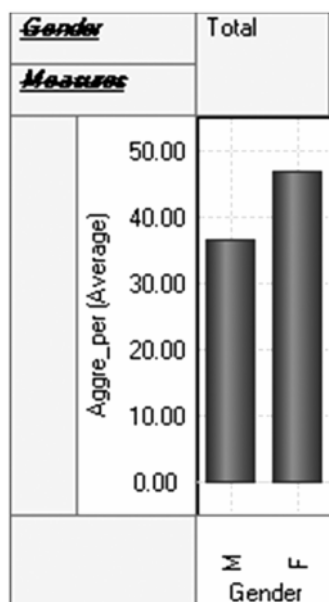


Fig. 3: Male Versus Female Feedback Ratio

The next investigation we performed was in the category male faculty -> (male, female) student and female faculty->(male, female) student and the results derived on the basis of mean score is given in the Figure 4. The conclusion as derived from the analysis is that mean feedback given by female students shows a high for both male and female as compared to male students. Here we have taken into consideration only those faculties who are associated with the Institute for a minimum of five continuous years. The correlation coefficient value r shows a value of 1 when male and female student’s feedback values have been plotted using line fit plots showing the extent of linear association between the two as in Figure 4.

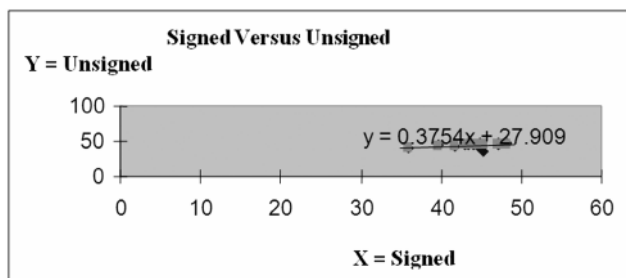


Fig. 4: Male-Female Feedback Ratios with r = 1

The other results which have been derived are as shown in Table 2 below

Table 2
Level Wise Analysis of Signed and Unsigned Feedback System

Change in signed versus unsigned feedback for faculties at the level of Professor – 2 %
Change in signed versus unsigned feedback for faculties at the level of Associate Professor – 2.75 %
Change in signed versus unsigned feedback for faculties at the level of Assistant Professor – 4.5 %

The data from which the above results were derived and the Table 1 which displays the data has been formed from these parameters taken into consideration:

1. Subject Knowledge
2. Knowledge beyond syllabus
3. Teaching Ability with New Aids
4. Communication Skills
5. Personal Guidance
6. Motivation to Students
7. Class Control
8. Punctuality and Regularity

5. CONCLUSION AND FUTURE WORK

The important conclusions from this study state that approach taken for taking feedback is an important component which has to be taken seriously into consideration while assessing the faculty’s performance based on student input because the behavioral pattern of the students has a marked influence on the assessment of the faculty. It has to be decided that how much significance has to be associated to the student feedback in making certain decisions and which category of student feedback can be prioritized over the other because a number of parameters such as regularity, performance, attitude, dedication, self learning initiatives of the students, the psychological aspects have to be considered before taking his/her feedback into consideration. The future work can be finding dependencies or factors contributing to student feedback, the verification and validation techniques implemented to filter out inconsistencies in feedback and to find out interesting patterns of feedback across management, and peer vertical.

REFERENCES

- [1] Breiman, L., Friedman, J.H., Olshen, R., and Stone, C.J., 1984, “Classification and RegressionTree Wadsworth & Brooks/Cole Advanced Books & Software”, Pacific California.
- [2] A.K. Jain and R. C. Dubes. [1988], “Algorithms for Clustering Data”, Prentice Hall.
- [3] R Agrawal, R Srikant, “Fast Algorithms for Mining Association Rules in Large Databases”,(1994) by Proceedings of the VLDB.

- [4] Ganti, V., Gehrke, J. and Ramakrishnan, "R. 1999a. CACTUS-Clustering Categorical Data Using Summaries", In Proceedings of the 5th ACM SIGKDD, 73-83, San Diego, CA.
- [5] GUHA, S., RASTOGI, R., and SHIM, K. 1999, "ROCK: A Robust Clustering Algorithm for Categorical Attributes", In Proceedings of the 15th ICDE, 512-521, Sydney, Australia.
- [6] Zaki, M.J., "Scalable Algorithms for Association Mining Knowledge and Data Engineering", IEEE Transactions on, 12, Issue 3, May/Jun 2000 Page(s):372 390 Digital Object Identifier 10.1109/69.846291
- [7] Chiu, T., Fang, D., Chen, J., and Wang, Y. 2001, "A Robust and Scalable Clustering Algorithm for Mixed Type Attributes in Large Database Environments", In Proceedings of the 7th ACM SIGKDD, 263-268, San Francisco, CA.
- [8] Luan J. [2002] "Data Mining and Knowledge Management in Higher Education", Presentation at AIR Forum, Toronto, Canada.
- [9] Fathi Elloumi, Ph.D., David Annand. [2002], "Integrating Faculty Research Performance Evaluation and the Balanced Scorecard in AU Strategic Planning: A Collaborative Model".
- [10] Raoul A. Arreola, Michael Theall, and Lawrence M. Aleamoni [2003], "Beyond Scholarship: Recognizing the Multiple Roles of the Professoriate." Paper presented at the Annual Meeting of the American Educational Research Association (Chicago, IL, April 21-25, 2003).
- [11] M.R.K. Krishna Rao. [2004], "Faculty and Student Motivation: KFUPM Faculty Perspectives".
- [12] Karin Sixl-Daniell, Amy Wong, and Jeremy B. Williams . [2004], "The Virtual University and the Quality Assurance Process: Recruiting and Retaining the Right Faculty", Proceedings of the 21st ASCILITE Conference.
- [13] Emmanuel N. Ogor.[2007], "Student Academic Performance Monitoring and Evaluation Using Data Mining Techniques", Electronics, Robotics and Automotive Mechanics Conference, 2007. CERMA 2007 Volume, Issue, 25-28 Sept. 2007 Page(s): 354 – 359 Digital Object Identifier 10.1109/CERMA.2007.4367712.
- [14] Amy Wong and Jason Fitzsimmons [2008], "Student Evaluation of Faculty: An Analysis of Survey Results", U21GlobalWorking Paper Series, No. 003/2008.
- [15] Cristóbal Romero, Sebastián Ventura, Pedro G. Espejo and César Hervás.[2008], "Data Mining Algorithms to Classify Students", The 1st International Conference on Educational Data Mining Montréal, Québec, Canada, June 20-21, 2008 Proceedings.
- [16] Chandrani Singh, Dr. Arpita Gopal, "Performance Analysis of Faculty Using Data Mining Techniques", IJFCSA-2010, 1st edition.
- [17] Mehrens W, Lehmann I., "Measurement and Evaluation in Education and Psychology", 4th Ed. NY; Holt, Rinehart and Winston, 1991.
- [18] Albanese MA., "Rating Educational Quality: Factors in the Erosion of Professional Standards. Acad Med", 1999; 74: 652-658.
- [19] Braskamp LA, Ory, JC., "Assessing Faculty Work: Enhancing Individual and Institutional Performance", San Francisco: Jossey-Bass, 1994.
- [20] Daberkow DW, Hilton C, Sanders CV, Chauvin SW., "Faculty Evaluations by Medicine Med Educ Online", [serial online] 2005;10:12.residents using known versus anonymous systems available from <http://www.med-ed-online.org>.