Factors Affecting Students' Evaluations of Teaching at College Level

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Abstract

Researchers have found that there is a strong correlation between overall positive course ratings of results in students evaluations of teaching (SET) at higher education and grades received. This study focuses on other educational factors that influence students' decisions to evaluate teaching such as calling on students and administering pop up quizzes. Multivariate statistical analysis is used to group students into clusters based on the closeness of their decision to rate the instructor according to the selected factors. This research is conducted in a developed country and the results may differ if the same approach is used elsewhere**.**

Keywords

Students Evaluation of Teaching, Multivariate statistical analysis

1. INTRODUCTION

The concept of using student evaluation of teaching, SET to evaluate instructors at the higher education level is an important and controversial concept. Its effectiveness is an important issue for the faculty members and administrators. Using SET is controversial as it plays an important role in faculty promotions, tenure and merit processes (Wallace and Wallace, 1998). Part of the engineering accreditation is the usage of this vital feedback from students and at what capacity it was used. Researchers have found that there is a strong correlation between overall positive course ratings and grades received. (Bauer, 1996; Crumbly, 1995). Haskell (1997) has found that faculty member's overemphasis on the numerical results may be contributing to an erosion of quality of teaching and scholarship, to a lower level of respect for teachers, and to weakening of faculty positions. Centra and Creech (1976) used a sample of 14,023 students have found a moderately strong, statistically significant relationship between student grade expectation and student evaluation of the instructor. They found that; students expecting an A grade, evaluate the instructor with a mean of 3.95 on 5 point scale. While students expecting a D grade, evaluate the instructor with a mean of 3.02. York (2009) argued that if the instructor inflates his grades, he or she more likely to get more positive evaluations. It is clear that researches used analytical analysis to come up with their conclusions, such as mean analysis, standard deviations analysis, analysis of variances, ANOVA or test of hypothesis. This research will use new approach to analyze the correlations between several factors influences student's evaluation's of their instructor's (Crumbley, et al, 2001). It will work by grouping students onto clusters according to the closeness level of their evaluations similarities of their instructor's evaluations. Multivariate statistical analysis will be used to achieve that. Then rank the developed clusters based on the highest similarities of student's perceptions of the considered factors to come up with the conclusion.

2. CLUSTERING ALGORITHMS BASED ON SIMILARITY COEFFICIENTS

The similarity coefficient is used to identify the relationships between parts in regard to certain characteristics under investigation. Based on these relationships, groups of items are identified. Among the algorithms used to identify and form part families associated with the formation of machine cells are clustering algorithms based on the similarity-coefficient method,(McAuley,1972). These are used to find similarities between parts and machines and then group them into part-family/machine cells. Pair-wise similarity coefficients between machines and parts are calculated using specific similarity-coefficient formulas. These similarities are then organized into a matrix called the similarity-coefficient matrix. This matrix is used as an input to one of the clustering algorithms, such as complete linkage clustering (CLINK). Complete linkage clustering forms groups by merging nearest neighbors on the basis of the most distance /similarity between them. It works as follows:

- Start with M clusters and an $M \times M$ symmetric matrix of distances or similarities, $D = \{ d_{ik} \}$
- Find the maximum distance/similarity in $D = \{ d_{ik} \}$
- Merge the corresponding objects U and V to get the cluster $\{UV\}$
- The distance/similarity between $\{UV\}$ and any other cluster Q is computed by

$$\{d_{UV}\}_Q = max \{d_{UQ}, d_{VQ}\}$$

The values d_{UQ} and d_{VQ} are the distance /similarity between clusters U and Q and clusters V and Q, respectively. The results are shown graphically in form of tree diagrams (Dendrogram). This concept will be used to establish clusters of student subjects based on their preferred learning styles. In the proposed approach, the maximum similarity occurs at higher number on the student's evaluations of the course instructors.

3. DATA COLLECTIONS

Undergraduate students enrolled in senior classes were invited to participate in this research. Several instructors helped in collecting the data of this research by inviting students to participate in answering the survey questionnaire. The instructors explained to the volunteer students the science and the importance of this research. Students were instructed not to write their names or any information leads to their identity. Students were assured that data will be analyzed collectively. Table 1, present set of questions given to group of senior level students belongs to different authenticity, gender, and nationality.

TABLE 1, FACTORS INFLUENCES STUDENT'S DECISION TO EVALUATE THEIR INSTRUCTORS

1. Asking embarrassing questions
2. The instructor grades hard
3. Uses unannounced quizzes
4. Ask for large amount of homework
5. Uses humor
6. Calling on students
7. Punishes late arrival students
8. Extend the class time duration beyond the scheduled time
9. Delay exams and homework results

4. DATA ANALYSIS

Table 2, presents preliminary answers of 10 students participated in this survey. Minitab software is used to build clusters according to single linkage clustering described before. Dendrogram based on the similarities of students' answers has been built as shown in Figures I and II.
As seen from the Dendrogram, factors 1, 2, 3 and 8 belong to same cluster, which means students' perceived these factors with same level of importance. Also, it is worth mentioning that these factors are joined together at about 60% of similarity level. While: factors 2 and 3 joined each other at about 65% similarity level. Factors 7 and 9 joined each other at about 75% similarity level from students' perspective. Figure 2; shows Dendrogram presenting the correlation between students' evaluations per the stated factors. It indicates that a student 1, 2, 3, 6, and 8 belongs to one cluster while students 4, 5, 9, 10, and 7 belong to another cluster of how they evaluate the importance of the mentioned factors.

TABLE 2, SHOWS PRELIMINARY RESULTS OBTAINED FROM THE DATA COLLECTED FROM 10 SURVEYED STUDENTS.

Student #	1. Asking embarrassing questions	2. The instructor grades hard	3. Uses unannounced quizzes	4. Ask for large amount of homework	5. Uses humor	6. Calling on students	7. Punishes late arrival students	8. Extend the class time duration beyond the scheduled time	9. Delay exams and homework results
1	4	5	4	3	1	4	1	5	2
2	5	3	4	3	2	3	1	4	1
3	5	3	4	4	2	3	1	5	1
4	4	4	5	3	3	4	2	3	2
5	5	3	5	3	2	3	2	1	1
6	4	4	5	5	1	2	1	4	1
7	2	4	3	5	1	1	5	4	4
8	4	5	4	4	1	1	1	5	1
9	3	3	3	3	2	1	1	1	1
10	1	5	4	1	1	2	1	5	3

Score; 1: Not important, 2: Slightly important, :3 Moderately important, 4:Very important, 5:Extremely important

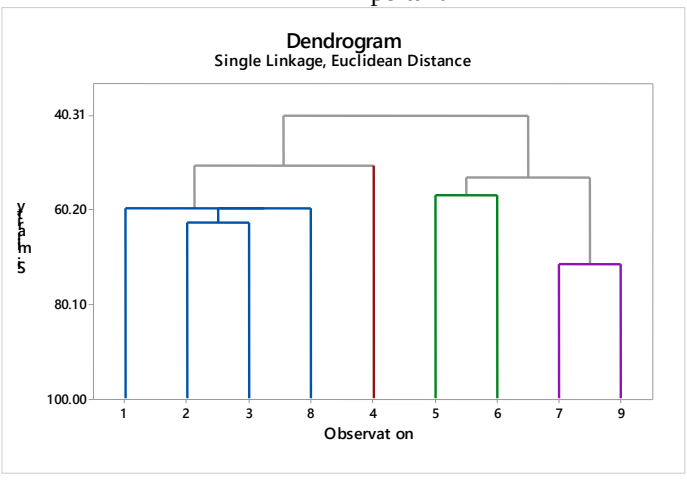

Figure 1, Similarities between factors from students point of view

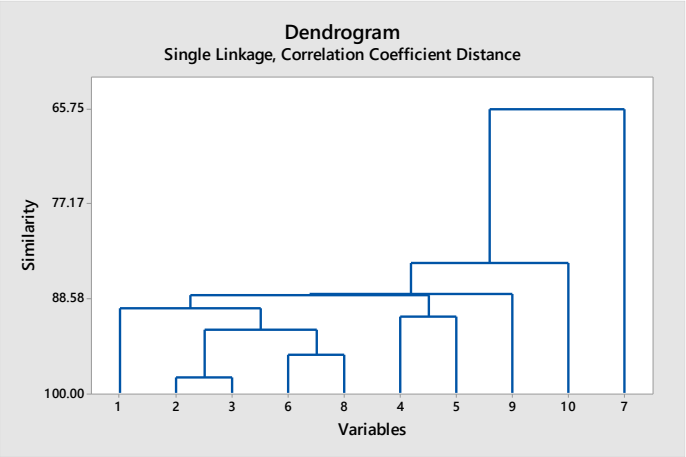

Figure 2, Similarities between students as they prcieve factors

5. CONCLUSION

This research illustrate the need to accommodate students needs during class lecturing since they are shown to be an important factors from students point of view when they evaluate courses at the end of the semester. Factors influence students decisions were formed into clusters based on their importance using multivariate statistical analysis. Also, clusters of students were formed using the same concept based on their evaluations of the importance of the stated factors. The established students' clusters can be studied more such as studying the gender composition of some clusters having extremely preferences toward certain factors.

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