

TEACHING LEARNING PROCESS ASSESSMENT BASED ON STUDENTS EVALUATION

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Abstract

In the past two decades, teaching in higher education has been raised in status and given much importance especially in improving Teaching Learning Methodology from the evaluation of Teachers done by students. Different parameters of teaching methods of faculties taken into account and evaluated through students to find out best teaching methodology. As feedbacks are most importantly students' evaluation reports provide faculties with important feedback.

Keywords : Teaching Learning, Evaluation, Higher Education, Students

I. INTRODUCTION

In recent era Education has become one of the important issue for developing the country [1]. The main purpose of educational institutions is to provide the excellence to the students. The way to achieve their excellence level in higher education system is to predict the academic performance of the students and by taking necessary action to give better performance and also the quality of teaching. The hidden knowledge is relevant with the dataset and it is extracted with data mining techniques. This work is to validate and plan with the capabilities of data mining techniques in the background of higher educational system in the data mining model. This paper evaluates the faculties' performance based on the classification task [2]. Evaluation of faculties performance has to be done based on students feedback. So, the precise area can be recognized. That helps the lecturer to take necessary actions like, more attention for the students

and also to improve their teaching methods. Finally that improves students' caliber and academic status. The data mining application in the learning frame work is Educational Data mining. The two drivers arise for this: first the data of volume that are composed of educational institutions has seriously improved. Second helps to collect data, still have some issues like lack of motivation and the educators have difficulties to collect feedback, and the interest of the students. In this work, Data mining approach is proposed to analyze faculty performance. Prediction is done using Data mining algorithms. Prediction is carried out with academic records with initial academic information.

Also, student's evaluations help the management and various departments in validating the usefulness of instruction. The discussions on this issue represent efforts to address a determined challenge facing in current higher education and how to develop assessments from evaluation given by students that should be informative, scalable, and can be accepted by the administrators and majority of experts in the field. Recognizing common approaches to valuation has not been met with unbridled enthusiasm and agreement. To compare the teaching methodology used by faculty members and give sculpture to good teaching, ten parameters are taken which are based on the feedbacks received from students.

1. Subject Knowledge
2. Preparation
3. Clarity and understandability
4. Enthusiasm in teaching
5. Finding students' level and learning progress
6. Availability
7. Quality of test and evaluation

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8. Motivating students
9. Students Consumerism
10. Competent Teaching

II. RELATED WORK

Student Evaluation of Teaching (SET) is an important technique of faculty in higher education. All teachers can gain knowledge from their course in various institutions, but their level of teaching is evaluated by the student's feedback. The SET [1] technique mainly consists of following three aspects.

1. Evaluation of Instructor.
2. The Teaching process.
3. Learning outcomes as perceived by the students.

Evaluating the instructor about their knowledge, method delivery and etc should be updated to the students each and every day. The content delivery is related to general activity and the teaching approaches. The instructor must satisfy student's expectation. Factors that affect SET ratings are

1. Physical appearance
2. Gender and Age
3. Ethnicity

Most commonly physically attractive teachers get higher ratings, and teachers whose age is less, also get higher rates than seniors. If the faculty regularly watches and motivates their students, their levels will be enhanced and those persons can get higher ratings. Evaluating the teaching process is more complex and complicated; there is no perfect tool to accurately measure the classroom session.

Student evaluation of teacher effectiveness is categorized by the feedback written by them and also the students can and do make significant assistance to the teaching-learning progression. The important factor of student evaluation is the growth of faculty and their self-

improvement. Additionally, it will be considered for teacher's promotion and also in salary decisions. The students of first benchers can observe more than the students in other desk.

Assessment is the bridge between teaching and learning. In learning there are 3 key processes

1. What is the position of the learner?
2. The steps for improving their skills.
3. How to meet student expectation?

The Formative Assessment mainly depends on learning intentions, eliciting evidence, feedback from students. According to this assessment the students are considered as learning resource for one another. So the classroom situation with instructors and students varies depending on the situation. Assessment may be either formative or summative; students play an important role in teaching-learning process.

The feedback collected from the students which may be in hard copy or soft copy, is very important for the instructor in place of their self-development [3]. The feedback also helps the management for taking better decision in case of appraisal. In some institutions, the question paper model differs, pass percentage also affects their systems.

To develop Assessments that are informative and scalable four questions are examined: Why? What? Who? and How? The detailed descriptions of the questions are

- Why we want assess?
- What are the things we required to assess?
- Who is responsible for these assessments?
- How to meet these assessments?

Classroom situations are increasingly seen as a source of information to guide teacher's development and 3 principle ideas are kind of work that is allotted, language chosen for communication, time and available resources. To improve

the quality of teaching [4] and taking effective decisions two methods are suggested such as statistical and machine learning method.

Statistical method includes regression analysis and statistical tests for identifying the faculty performance whereas the machine learning includes decision trees for identifying the most important factor. The association rules can be used to find the relationship among the factors [5].

For good teaching knowledge of the subject is sufficient. Teaching methodology may differ for each institution and the instructor but they must give their content very clearly and in an understandable manner [6]. Students will judge their instructor based on his/her enthusiasm. Instructors should deliver their points to student's level, because in a classroom multiple levels of students are gathered.

Students expect their faculty members always to be available and ready to help them. While evaluating the students, instructors try to avoid partiality because it affects the students personally. On the other hand quality of examinations also affects the grading [7]. If they do not satisfy the student's need, the students and their parents give low ratings. But there is no perfect model to analyze the teacher's ability.

III. SYSTEM OVERVIEW

For this work dataset collected as a form of feedback from students. Feedback form is prepared with ten parameters

1. Subject Knowledge
2. Preparation
3. Clarity and understandability
4. Enthusiasm in teaching
5. Finding students' level and learning progress
6. Availability
7. Quality of test and evaluation
8. Motivating students

9. Students Consumerism
10. Competent Teaching.

Based on the feedback score from the above mentioned parameters faculty feedback dataset is framed with faculty name, subject and feedback. 500 feedbacks are collected for 50 faculty members from various departments.

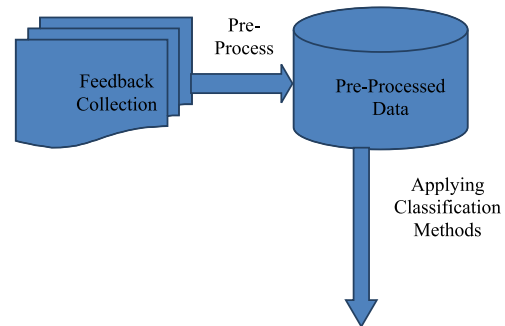


Fig1.1 System Overflow Diagram

IV. PROPOSED STUDY

The Neural networks techniques are gorgeous biologically-inspired paradigm programming enabling a computer to learn about the data which are to be observed.

- Deep learning, a authoritative position of technique for learning in neural networks

General Methodology (Parts of Our Algorithm)

Deep learning methodology to build the model:

1. Define the representation configuration (number of input features)
2. Initialize parameter and define hyper parameters:
 - number of iterations
 - number of layers L in the neural network
 - size of the hidden layers
 - learning rate α
3. Loop for iterations:
 - Advance Propagation (calculate current loss)

- Calculate rate function
- Back propagation (calculate current gradient)
- Revise parameters (by means of parameters, and grads from back prop)

4. The existing parameter are used to predict the methods.

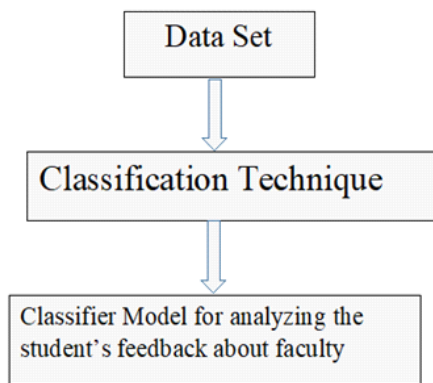
V. EXPERIMENTAL RESULTS

In order to see the impact of the individual benefit on the whole system, various experiments are conducted based on the sample parameters on training data. Using that a final model configuration based on test data is selected.

Dataset:

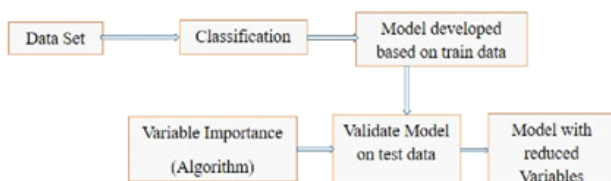
For making the assessment of Teaching Learning process among faculty members especially in higher education, feedback[8] forms are given to students with various parameters discussed in the introduction section and collected. Based on the evaluation of students the scores and feedback given to the faculty members are taken as dataset.

Problem Characterization – Classification



Framework:

Flow Chart:



Solution Conceptualization:

- Identify whether data is clean.
- Check missing values.

Identifying variables, influencing feedback and look for possible relationship between variables. Such as Correlation, Box plots, Scatter Plots, Chi-square test, etc.

Construct a model with less number of variables to classify the student's feedback to the faculties' performance.

- To Work with data frames: import pandas as pd.
- To perform numerical operations: introduce numpy as np.
- To visualize requisite data: import sea born as sns.
- To partition the agreed data: from sklearn.model_selection import train_test_split.
- To import the library for logistic regression: from sklearn.linear model import Logistic Regression

· To introduce the performance matrices – Accurateness Score and uncertainty matrix:

- `sklearn.metrics` introduce `accuracy_score, confusion_matrix`
- To import the vital data: `data_feedback=pd.readcsv('feedback.csv')`
- Create the copy of original data: `data = data_feedback.copy()`

Exploratory Data Analysis:

1. Acquiring to discern the data
2. Facts preprocessing (Missing values)
3. Cross tables and visualization

1. Acquiring to discern the data

Print (`data.info ()`) is used to find out the data types of variables used in the data set. Such as S.NO, ROLL NO, FACULTYNAME, SUBJECT, FEEDBACK and etc.

2. Facts Preprocessing:

Data.is null () is use to locate out the missing values.

Data.is null ()

Out[11]:

S.NO, ROLL NO, FACULTYNAME, SUBJECT, FD
VALUE FEEDBACK

```
0 False False False False False False False False .....
1 False False False False False False False False .....
2 False False False False False False False False .....
3 False False False False False False False False .....
4 False False False False False False False False .....
.. .. . . . . . . . . . . . . . . . . . . . . . . . . . . . .
```

Print ('Feedback Columns with Null

values:\n',data.isnull().sum())

('Feedback Columns with Null values:\n',

SNO	0
ROLL NO	0
FACULTYNAME	0
SUBJECT	0
FEEDBACK..etc	0

· Summary of numerical variables:

summary_num=data.describe ()

print (summary_num)

· Summary of categorical variables:

summary_cate=data.describe(include="O")

print(summary_cate)

	ROLL NO	FACULTYNAME	SUBJECT	FEEDBACK	Etc..
Count	2160	2160	2160	2160
Unique	540	4	4	5	
Top	17ADA0001	FACULTY 4	Software Testing	good
Freq	4	180	60	1560

· Checking for unique values:

print(np.unique(data['FACULTYNAME']))

['FACULTY1' 'FACULTY2' 'FACULTY3'

"FACULTY4',....'FACULTY 14']

· Relationship between independent variables:

Correlation=data2.corr()

print(fb_abt_faculty)

FEEDBACK	FACULTY NAME			
	FACULTY1	FACULTY2	FACULTY3	FACULTY4
Very Good	0	0.333333	0.62963	0.037037
Good	0.033333	0.3	0.3	0.366667
Neutral	0.36	0.28	0.1	0.26
Bad	0.772727	0	0.045455	0.181818
Very Bad	0.8	0	0	0.2

The ten feedback parameters Subject Knowledge, Preparation, Clarity and understandability, Enthusiasm in teaching, Finding students' level and learning progress, Availability, Quality of test and evaluation, Motivating students, Students Consumerism and Competent Teaching are analyzed for teaching learning process assessment based on students evaluation.

In this above table, the results of relationship between all the feedback parameters for the first four faculty members have shown. The classification[9] made for the faculty members from one department.

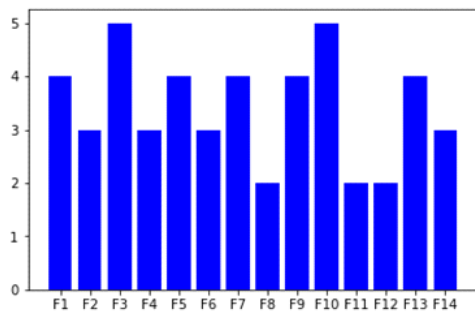
Students' feedback values add an important constituent to the response set in support of the costing of valuable instructing. Students' evaluation as:

- Multidimensional
- Reliable
- Relatively acceptable against different indicators of effective teaching.
- Useful in improving teaching effectiveness.

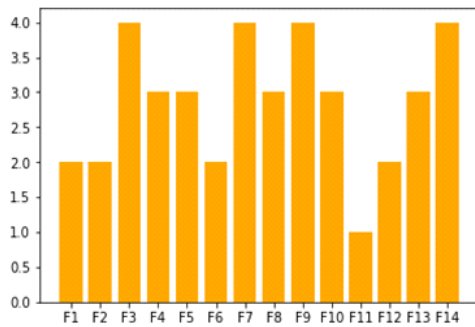
Each student gave the feedback through the feedback parameters such as Subject Knowledge, Preparation, Clarity and understandability, Enthusiasm in teaching, Finding students' level and learning progress, Availability, Quality of test and evaluation, Motivating students, Students Consumerism and Competent Teaching. Using classification method in python, the data set is processed. Based on the

students' feedback, the following visualization graphs are obtained for each parameters taken for evaluation. At the end of these graph representation it is noticed that faculty 3 had obtained good response from the students. Similarly, it is found that the essential improvement expected by student from the faculty. So, this experiment can help the faculty for their effective teaching. Through this visualization of variety of feedback parameters students' expectation on faculty members can be analyzed. Surely, this will lead to the best growth in the education method.

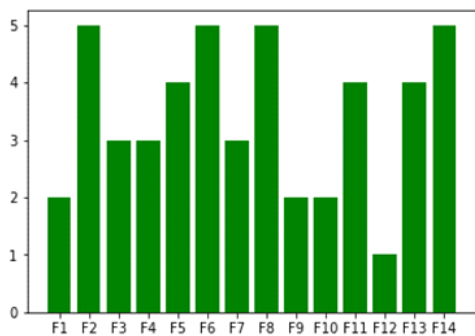
1. Based On Subject Knowledge:



2. Based On Preparation:

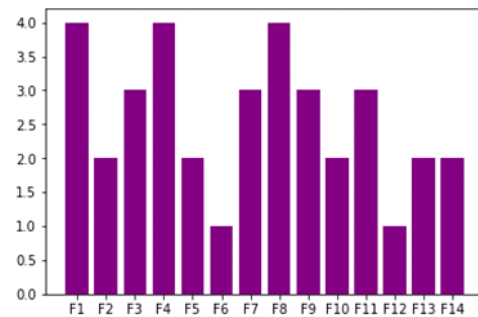


3. Based On Clarity And Understandability:

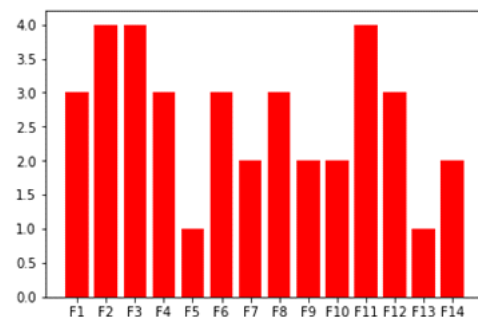


Axis - X :

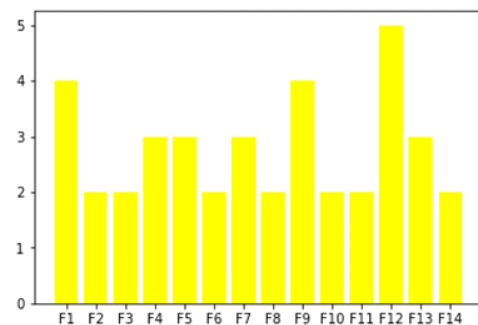
4. Feedback Based On Enthusiasm In Teaching:



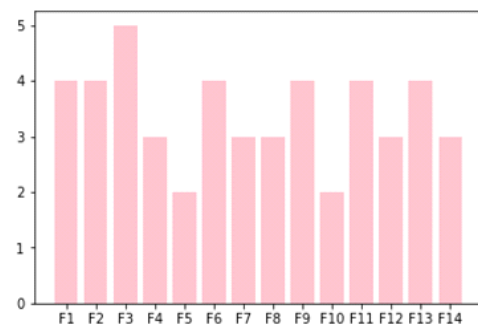
5. Feedback Based on Finding Student's Level and Learning Progress:



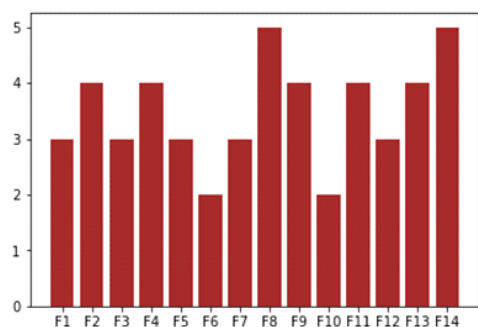
6. Feedback Based on Availability:



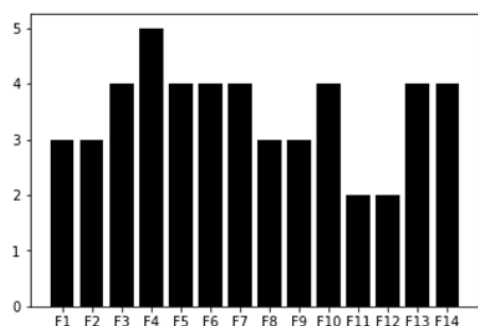
7. Feedback Based on Students Consumerism:



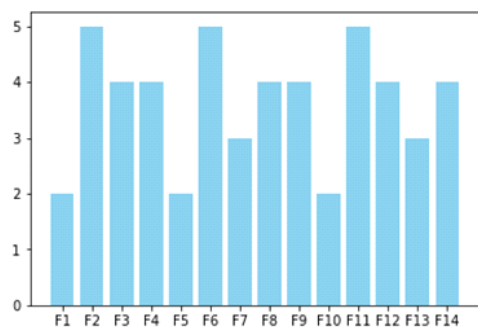
8. Feedback Based on Competent Teaching:



9. Feedback Based on Quality of Test and Evaluation:



10. Feedback Based on Motivating Students:



Axis - X :

Faculty Name : Faculty 1 = F1, Faculty 2 = F2, Faculty 3 = F3, Faculty 4 = F4 and so on.

Axis - Y

Feedback About Subject Knowledge :

5 = Very Good, 4 = Good, 3 = Neutral, 2 = Bad, 1 = Very Bad.

Each student gave the feedback through the feedback parameters such as Knowledge, Preparation, Clarity, and

understandability, Enthusiasm in teaching, Finding students level and learning progress, Availability, quality of test and evaluation, Motivating students, Students consumerism and Competent Teaching. Using classification method in python, we processed the data set. Based on the students feedback, the following visualization graphs are obtained for each parameters taken for evaluation. At the end of these graph representation, we noticed that faculty 3 got good response from the students. Similarly, we found that the essential improvement expected by student from the faculty. So, this experiment can help the faculty for their effective teaching. By these visualization of variety of feedback parameters, they can find out that student expectation from the faculty. This will lead to the best growth in the education method as discussed in sentiment analysis[10].

VI. CONCLUSION

Assessment of student accomplishment or understanding the quality education methods is the basic to effective teaching. It attentions on students' feedback to strengthen the teaching and learning progress. Several deep learning techniques are used to analyze the collected students' feedback dataset. The student feedback dataset fragmented into two parts. Such as 30% for testing and 70% for training. Moreover accuracy is evaluated through confusion matrix using python language. Illustration of graphs and tables clearly shows that the students' observations on teaching methodology.

Based on these graphs, the educational institutions can improve their effective learning environment.

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