

Literature Review on Teacher's Performance Evaluation Tool Using Opinion Mining with Sentiment Analysis

¹Sweta chaurasia, ²Kewal krishan

¹M.Tech Scholar, Lovely Professional University, Punjab, India

²Assistant Professor, Lovely Professional University, Punjab, India

Abstract: In this the researcher aim is to know and calculate the Teacher performance evaluation tool by using opinion mining with sentiment analysis. The study may identify positive and negative feedback of teachers on the basis of student feedback. However identifying sentiment is challenging. Sentiment analysis need classifying and keeping them in record as per there category. Thus, on the basis of student feedback the school administrators and educators will be more aware about the sentiments and concerns of the students.

Keywords: Sentiment Analysis, Naïve Bayes Algorithm, Teacher Performance Rating, Quantitative and Qualitative Rating, natural language tool kit.

I. INTRODUCTION

The 'student performance' is concern by all level of education sector i.e school level to PhD level. The process is concern of knowledge level of education they are gaining in education sector [1]. To ensure that academic excellence can be achieved, it requires action and cooperation from all levels of teacher, student and management. The learning environment which is inviting, conducive and fun is essential in teaching and learning. This is because the suitability of a teacher's teaching style [2].

The evaluation questionnaire has been used as instrument for data collection. It consists of quantitative and qualitative questions. The quantitative data was collected by closed-ended questions such multiple choice, while the qualitative data was collected by open-ended questions as comments and suggestions from students opinion in textual form. Faculties often have difficulty making sense of students' written comments on teaching evaluations. Although such open-ended comments are usually quite rich with observations and insights, instructors frequently struggle to draw conclusions from them [4].

College academic affairs management is one of the important works of college management. It is a basic work integrating management and services. It is the basis of ensuring teaching order, improving education quality, and enlarging educational scale. Their quality and working capacity will directly affect the teaching order, teaching quality, educational level, and even the reputation of the college. The performance reform of college academic affairs management personnel plays an important role on fully arousing the working initiative of academic affairs management personnel, assuring better daily instruction and operation and long-term stable development of colleges [5].

II. CHALLENGES

As we know Teacher's Performance Evaluation Tool Using Opinion Mining with Sentiment Analysis is to know the performance of teacher on the basis of student feedback are gain. There are some of challenges we need to face while calculating performance which are described below:-

2.1 Fake Opinion:

It is also called Fake review and refers to bogus or fake reviews which misguide the readers by providing them untruthful negative or positive opinions related to any substance and in order to lower the reputation of any substance. These spams make sentiment opinion useless in various application areas. This is a social challenge faced by the opinion mining and in spite of this challenge [6].

2.2 Evaluation technology:

In this technology we have to find the method through which evaluation of teacher performance is done by some attributes like communication skills, experience of teacher, etc. Deciding range for evaluation is somehow difficult decide on the basis of sample which we had taken from student to calculate the appropriate results [7].

2.3 Data Collection Procedure:

While collecting data we need to consult with student as much as possible to find appropriate result while doing research. We need to have feedback of particular student. In this we are concern about collecting data from different student and analysis there opinion to find out true output. We must request them to give their view as individual request is needed [8].

2.4 Statistical challenges:

In this, the development of “value-added” models represents significant progress as they are designed to control for the individual student providing previous results, and therefore have the potential to identify the contribution an individual teacher made to a student achievement. However, in order to be effective, value-added models require vast amounts of data to be collected through large scale national-level student testing across levels of education and subjects.

III. TECHNIQUES SENTIMENT ANALYSIS

The techniques used in sentiment analysis is shown in figure step by step.

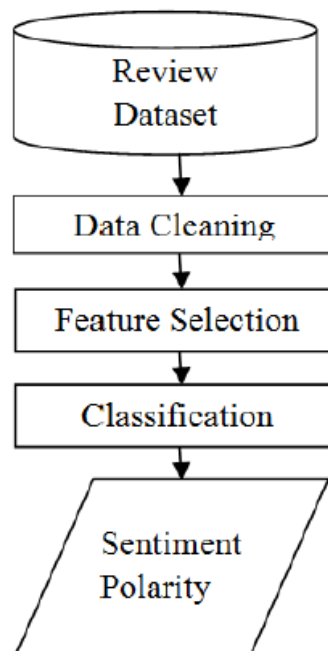


Figure 1: Sentiment Analysis Process Flow

3.1 Data cleaning:

No need to worry about word removal and special character [10]. Stop word,

Stemming and tagging has been performed [11] [12]. Tokenization [13] divides given text into token. Conjunction rule, Negation rule, Part of Speech tagging by POS tagger and Baseline approach has been implemented in [14]. NLTK (natural language tool kit) is used in many existing papers with python to preprocess the dataset.

Following various methods are used in sentiment analysis as a part of preprocessing.

1. Convert upper case to lower case letter, remove unwanted Punctuation, remove extra space, etc.
2. Conjunction rule: In this rule we extract grammar rules.
3. Negation rule: In this rule we removes negation word which reverses meaning of word in review.

3.2 Features:

In this covers the computational treatment of sentiments and emotions expressed in a text [15]. As said, SA counts on four tasks: opinions identification, features extraction, Sentiment classification, or visualization and summarization of results. In this chi square method is used for positive and negative feedback of teachers. We remove noisy features to get accurate results of performance [16].

3.3 Classification approaches:

Machine learning is further divided into two category namely supervised and unsupervised learning. Supervised classification algorithms are probabilistic classifier, linear classifier, decision tree and rule based classifier. Supervised learning technique is based on labeled dataset which is provided as input to train the model and this model is applied to test data to generate output. Sentiment classification in machine learning consists of twosteps. First one is to extract feature and store in feature vector

and second one is to train feature vector by using classification algorithms. given as input to train input set by classifier using naïve bayes and that trained model is applied on test data to generate either positive or negative sentiment. The bayes theorem is as follows.

$$P(H|X) = P(X/H)P(H)/P(X) \text{-----}(17)$$

IV. CLASSIFIERS

There are some classifiers used in this approach. Some of them are explained below along with their description. They are listed and described below.

4.1 SVM:

The full form of svm is Support vector machine .It examines the data, identify hyper plane that classify data in to two classes with maximum margin. SVM also supports classification and regression in statistical learning. A separating hyper plane is written as :

$$W * X + b = 0 \text{-----}(18)$$

Where $W = \{w_1$

, w_2

, w_3

, ... , $w_n\}$. w_n

is defined as weight vector of n attributes. b is defined as bias. Distance from separating hyper plane to any point on H1 is $1/|W|$ and same to any point on H2 is $1/|W|$. So maximum margin is $2/|W|$. if hyper plane value > 0 then +ve category, if hyper plane value < 0 then

-ve category, if hyper plane value = 0 then all points are perpendicular to W. if value of margin is large then large penalty is assigned to errors/margin errors. If value of margin is

Small then some points become margin error and orientation of hyper plane is changed.

$$W =, \alpha_j \geq 0 \text{----}(19)$$

Let $c(1,-1)$ is class (positive, negative) for document d.

4.2 Naïve Bayes:

It is used to predict the probability for a given tuple to belong to a particular class. It is used because of its easiness in both during training and classifying steps. Pre-processed data is given as input to train input set by classifier using naïve bayes and that trained model is applied on test data to generate either positive or negative sentiment. The bayes theorem is as follows.

$$P(H|X) = \frac{P(X|H)P(H)}{P(X)} \text{-----(17)}$$

H-Hypothesis, X-Tuples, $P(H|X)$ represents Posterior probability of H conditioned on X i.e. the Probability that a Hypothesis holds true given the value of X, $P(H)$ represents

Prior probability of H i.e the Probability that H holds true irrespective of the tuple values, $P(X|H)$ represents posterior probability of X conditioned on H i.e. the Probability that X will have certain values for a given Hypothesis, $P(X)$ represents Prior probability of X i.e the Probability that X will have certain values.

TABLE I: COMPARATIVE STUDY OF LITERATURE REVIEW

Author	Year	Techniques/Methods	outcome
Hamad Naeem et al	2015	In this researcher had used BF-tree and LMT decision tree algorithm for calculating better performance of teacher.	Data mining approach in this we can find out performance of teacher online based.
Felder, R. M., & Henriques et al	1995	Syntax and semantics is followed for prediction of language.	Prediction and opinion mining is done for better result in foreign so that other language can easily understood by student easily.
Francis F. Balahadia, Ma. Corazon G. Fernando, Irish C. Juanatas et al	2016	In this researcher had used naïve Bayes algorithm	Better teacher performance is done by opinion mining with sentiment analysis.
J. Sang, H. Naeem et al	2015	In this researcher had used SVM (support vector machine) classifier for predicting teacher performance.	Researcher had got best result by analyzing student feedback of teachers.
Newman, P. R et al	1992	In this researcher had used Pearson correlation analysis.	Researcher had analysis teaching style and engagement of student is poor need to change.
Manzi, J et al	2009	This is totally based on analysis of individual teacher activity. Their skills, knowledge, etc. is consider	In this researcher had found out teacher with extra afford in teaching should be given some intensive benefits.
Tripathy, A., Agrawal, A. and Rath, S.K et al	2015	In this SVM (support vector machine) classifiers is used for prediction and opining mining.	Better machine techniques are designed by researcher for sentiment analysis and opinion mining.
Jeyapriya, A. and Selvi, K. et al	2015	In this researcher had used supervised learning techniques for analyzing data.	In this better product review is found by researcher while analyzing data.
Khan, F.H., Qamar, U. and Javed, M.Y et al	2014	In this SVM (support vector machine) classifier is used.	Sentiment analysis is done in this paper by researcher for better information security.
Mouthami, K., Devi, K.N. and Bhaskaran et al	2013	In this text summarization technique is used for sentiment analysis.	In this survey is performed based on sentiment analysis.
Bhadane, C., Dalal, H. and Doshi, H et al	2015	SVM (support vector machine) classifier is used for opinion mining.	In this researcher had found better result for opinion mining.
Patel, S.N. and Choksi et al	2015	In this researcher had used supervised learning techniques for analyzing data.	In this better product review is found by researcher while analyzing data.
Mouthami, K., Devi, K.N. and Bhaskaran et al	2013	In these text summarization techniques is used for sentiment analysis.	In this survey is performed based on sentiment analysis.

REFERENCES

- [1] Hamad Naeem, Jun Sang. A Generic Feedback for Better Evaluation of Teacher Performance. IEEE, 2015
- [2] Felder, R. M., & Henriques, E. R. (1995) Learning and teaching styles in foreign and second language education. *Foreign Language Annals*, 28 (1), 21-31.
- [3] Francis F. Balahadia, Ma. Corazon G. Fernando, Irish C. Juanatas, Teacher's Performance Evaluation Tool Using Opinion Mining with Sentiment Analysis, IEEE, 2016.
- [4] J. Sang, H. Naeem (2015) . A Generic Feedback System for Better Evaluation of Teacher Performamance.
- [5] Newman, P. R. (1992). Conceptual models of student engagement. National Center of Effective Secondary Schools. University of Wisconsin.
- [6] (2015) Machine Learning with Naïve Bayes Classifier[Online]. Available: <http://blog.datumbox.com/machine-learningtutorial-the-naive-bayes-text-classifier/>
- [7] DET (Department of Education- Government of Western Australia) (2006), Singapore – Education System and School Accountability Research Papers, Evaluation and Accountability Directorate, DET
- [8] The New Teacher Project (2010). Teacher Evaluation 2.0. Retrieved from: www.tntp.org • info@tntp.org
- [9] Manzi, J. (2009), Individual Incentives and Teacher Evaluation: The Chilean Case. (Revised Draft February 2009); Measure Centre (MIDE UC), Universidad Católica de Chile, Santiago
- [10] Tripathy, A., Agrawal, A. and Rath, S.K., 2015. Classification of Sentimental Reviews Using Machine Learning Techniques. *Procedia Computer Science*, 57, pp.821-829.
- [11] Jeyapriya, A. and Selvi, K., 2015, February. Extracting aspects and mining opinions in product reviews using supervised learning algorithm. In *Electronics and Communication Systems (ICECS)*, 2015 2nd International Conference on (pp. 548-552). IEEE.
- [12] Khan, F.H., Qamar, U. and Javed, M.Y., 2014, November. Sentiview: A visual sentiment analysis framework. In *Information Society (i-Society)*, 2014 International Conference on (pp. 291-296). IEEE.
- [13] Mouthami, K., Devi, K.N. and Bhaskaran, V.M., 2013, February. Sentiment analysis and classification based on textual reviews. In *Information Communication and Embedded Systems (ICICES)*, 2013 International Conference on (pp. 271-276). IEEE.
- [14] Bhadane, C., Dalal, H. and Doshi, H., 2015. Sentiment analysis: Measuring opinions. *Procedia Computer Science*, 45, pp.808-814
- [15] Henrique Siqueira and Flavia Barros Centro de Informática (CIn) - Universidade Federal de Pernambuco (UFPE), 2015
- [16] *International Journal of Computer Applications* (0975 – 8887) Volume 140 – No.3, April 2016
- [17] Jeyapriya, A. and Selvi, K., 2015, February. Extracting aspects and mining opinions in product reviews using supervised learning algorithm. In *Electronics and Communication Systems (ICECS)*, 2015 2nd International Conference on (pp. 548-552). IEEE.
- [18] Patel, S.N. and Choksi, M.J.B., 2015. A Survey of Sentiment Classification Techniques. *Journal for Research* | Volume, 1(01).
- [19] Mouthami, K., Devi, K.N. and Bhaskaran, V.M., 2013, February. Sentiment analysis and classification based on textual reviews. In *Information Communication and Embedded Systems (ICICES)*, 2013 International Conference on (pp. 271-276). IEEE.