

Student Learning Experiences from Social Media - A Review

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Abstract— Social media is used by every individual to express their feelings, opinions, emotions and experiences. Social media acts as a platform for students to express their educational experiences, negative emotions and feelings. Educational data mining is to analyze the social media data used by students to identify education related problems. Analyzing the unstructured data provides valuable information about students learning experiences. Investigating the informal discussion of students helps the educational researches to identify the students' behavior and their views about learning experiences. In this paper a review has been made on various techniques used by researchers to identify engineering college students' problems using tweets.

Key words: Students learning experiences; Engineering college tweets; label classification

I. INTRODUCTION

Social media such as Twitter and Facebook has emerged as valuable real time information resources due to its millions of users. The bulk of live information from social media streams provides important information for large corporations and government organizations[12]. Various researches have analyzed Twitter contents using hash tags such as healthcare, marketing, elections to gain deeper understanding about specific domains. Educational Data Mining (EDM) is an approach of analyzing data from educational settings to understand the learning environment of students to help the institution for academic decision making[11]. EDM provides knowledge of teaching and learning process for effective education.

Students frequently use forums and social media sites to post questions and remarks and also react to each other's contributions. The content in social media reflects student's casual discussion focused on their educational experience, mind-set and views about the learning procedure. The information gathered from such un-instrumented environments can present valuable data to analyze student experiences[6]. Through traditional data gathering techniques, it is difficult to analyze what topic the students are discussing about and how they are grouped. If the real time feedback from students through social media is analyzed efficiently, it provides numerous benefits for the instructors such as change of teaching style, understanding students learning behavior, etc. Collecting feedback from students guides the instructor when the students does not understand or when the lecture's teaching pace is fast or slow[5].

This paper presents an overview of various authors techniques used to analyze the student learning experiences for classifying the problems as labels.

Chapter 2 discusses about the importance of educational data mining. Chapter 3 reveals the important aspects involved in students learning experiences and

chapter 4 provides a review of engineering college tweet analyzes made by various researchers.

II. EDUCATIONAL DATA MINING

The influence of social media on learning and teaching environment is rapidly growing. Researches, educators and students are constantly using the social media technologies for knowledge construction. Technologies such as Weblogs, Wikis, Microblogs, RSS and Social networking sites provide opportunities to receive and create content[1]. The data gathered from social media technologies can be used for collaborative learning. Analyzing social media data particularly in higher education is one of the objectives of educational data mining to improve the performance of students academically. EDM explores the data in education context by applying different data mining techniques. It contributes to the study of how students learn and in which setting they learn[10].

The data repository from social media helps to better understand the problems of learners and learning environment[13]. The digital foot prints in social media sites provide vast amount of implicit knowledge for educational researches to improve the education quality and policy. Studies about sentiment analysis for education focus mainly on e-learning. However analyzing sentiments in classroom learning can help the lecturers to understand the students learning experience and improve teaching. EDM place a vital role for data-driven decision making for improving the educational practices[10]. The next section discusses about the issues in students learning experiences.

III. STUDENTS LEARNING EXPERIENCES

The educational researches have been using surveys, interviews, classroom activities to collect data related to students learning experiences which are normally time consuming. Moreover as students thinking about the past obscure over a time, the surveys do not reflect the actual educational experiences.

With increasing popularity of social media, students treat it as a personal space to join hands with their peers or like-minded people to discuss and share their everyday encounters in informal and casual manner. Since social media provides a place for the students to share their joy and struggle, express emotions and stress and to seek social support, the online conversations act as an outlook of their behaviors that cannot be easily seen in formal classroom settings[7].

Student's informal conversation on social media reflects their educational experiences such as opinions about the subjects and educational environments, feelings and concerns about the learning process. Data from such un-structured media can provide valuable knowledge about the problems of student learning[9]. As the volume of student-created content grows drastically on social media sites,

interest on utilizing these data to infer about student behaviors also grows. The discussion of student experiences reflected in social media requires complex qualitative human interpretation and quantitative analysis of the acquired data. Gathering the data and analyzing its content is a challenging process due to short and conversational nature of information, massive data size and the heterogeneous nature of social media content[12].

IV. RELATED WORK

Ranjeeta et al.[8] proposed a system that works on tweets related to engineering problems. The tweets are first loaded and preprocessed. Inductive content analysis is performed and categories are identified as labels heavy study load, lack of social engagement, negative emotions, sleep problems and diversity issues. The authors used Non Linear Support Vector Machine, Naïve Bayes and Linear Support Vector Machine to classify tweets. The multi-label classifiers were compared in terms of accuracy and proved that Non Linear SVM has shown more accuracy than Naïve Bayes classifier and Linear Support Vector Machine classifier.

Xin Chen et al.[11] performed an inductive content analysis to identify what were the major worries, concerns and issues of engineering students from the Purdue data set related to student's experiences. The author implement and evaluated multi label classifier which can be applied as a monitoring mechanism to identify at-risk students of a specific university without repeating the manual work frequently. From the unique #engineering problem tweets gathered from twitter, the authors identified 13 initial categories namely curriculum problems, heavy study load, study difficulties, imbalanced life, future worries, gender diversity, sleep problems, stress, lack of motivation, physical health problems, culture, crisis and others. Multi-label classifier was used to classify tweets based on the categories developed from the content analysis. The authors suggested that the proposed detector can be applied as a monitoring mechanism to identify at-risk students for a specific university.

Learning related emotions has a wide range of applications such as identifying anxiety, depression, mood, etc. Nabeela et al.[4] conducted several experiments to investigate the emotions related to learning behavior from students textual classroom feedbacks. Learning emotions were identified using models and evaluation metrics and the author suggested that complement naïve base (CNB) as the best classifier.

Since tweets are casual, limited and contain spelling errors, Maryam et al.[2] investigated a method to automatically detect and classify the emotions expressed by twitter messages. The authors designed and implemented an algorithm to automatically label twitter messages according to the emotions of their authors and resolved the problems of high dimensional feature space in twitter dataset. The authors used emotion class such as Happy-Active, Happy-Inactive, Unhappy- Active, Unhappy-Inactive and several features such as unigrams, emoticons and punctuations for emotion detection. The accuracy of various machine learning algorithms including SVM, KNN, Decision tree and Naïve Bayes were compared and the authors were able to achieve 90% classification accuracy.

Automatic techniques to classify social messages of students based on emotions they express can assist college students to overcome from depression and to detect the students who are in need of counseling. Maryam et al.[3] conducted a study to compare the accuracy of labels based on emotions generated automatically using hash tag with labels generated by non-expert annotators and indicated the labels created by the non-experts to classify emotions expressed in twitter messages are not sufficiently reliable.

To classify the students based on content shared in the social media and to separate out meaningful information from the label "others", Priyanka et al.[7] conducted an inductive content analysis on the engineering problems dataset and extracted tweets using a new theme "GOODTHING". The authors improved the probability of the two labels "Others" and "Goodthings" and concluded that student's not only post their bad experiences but also good experiences on social media.

Nableela et al.[5] created a system to automatically analyze students feedback from social data and present the results to the lecturer without delay to provide meaningful and important information. To analyze the students' feedback the author proposed the use of sentiment analysis to the specific domain. Four machine learning methods namely Naïve Bayes, Complement Naïve Bayes, Maximum Entropy and Support Vector Machines were used for learning and analyzing sentiments from students textual feedback and the authors identified SVM with radial basis kernel and CNB are efficient for real-time feedback analysis.

Most of the papers have used Twitter content to identify students learning experiences. One of the major limitation of these studies is not all students are active on Twitter. Secondly, the majority of the data found in social media reflects student's complaints, negative emotions and problems with few number of positive discussions.

V. CONCLUSION

Social media sites such as Facebook, Twitter have become a popular platform to communicate and exchange information. Students frequently use the social media sites to post their learning experiences such as problems, opinion, emotions etc. The aim of EDM in social network is to discover valuable information from educational discussion and utilize the information to understand the experiences of students. This paper has reviewed various algorithms related to engineering college students learning problems.

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