Tweetering Continuing Education:  
A Twitter Mining on Massive Open Online Courses

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ABSTRACT

The rapid growth of technology has transformed education from conventional classroom teaching to learner centred, flexible learning anytime anywhere resulting in the popularity of Massive Open Online Courses (MOOCs). It is evident that many MOOCs have adopted social media tools to engage their learners through information sharing, participation, and collaboration to create and consume information. In addition to this, social media is the best place to understand crowd sentiments considering the massive amount of data being generated. This study through text mining of MOOC providers related Twitter data discovers the sentiments of users towards MOOCs, association rules, and the engagement of MOOC providers in Twitter. This article also analyses the traits of the influencers in seven MOOC providers and discovers that the influencers are popular users with higher numbers of followers count. The implications are discussed for MOOC industry, academic institutions, and the government.

KEYWORDS

Massive Open Online Courses, Opinion Mining, Social Media Analytics, Twitter Mining

1. INTRODUCTION

The emergence of Web 2.0 in 2000’s (O’Reilly, 2005) has revolutionised the way people interact through the internet encouraging the information sharing, participation, and collaboration of individuals to create and consume information through blogs, wikis, social networking sites, etc. (Rennie and Morrison, 2013). The advancement in technology has also transformed education with reducing the time and space constraints associated with traditional learning methods. Massive open online courses (MOOCs) are gaining popularity for providing online courses to a larger mass for free or with very nominal costs. For instance, the MOOC market is expected to grow from 1.83 billion USD in 2015 to 8.5 billion USD in 2020 (MarketsandMarkets, 2015). Despite the advantages of asynchronous learning of MOOCs and being offered at almost free of cost, the attrition rate is very high (Clow, 2013; Perna et al., 2014). Therefore, it is essential to understand the users’ attitude towards MOOCs, and social media is the best place to understand crowd sentiments considering the massive amount of data being created.

Text analysis from social network sites has helped researchers to understand the research problems and provide suggestions in various areas including product sales (Chong et al., 2016), predicting election results (Rill et al., 2014), comprehending public sentiments in a sensitive situation like disasters (Bai et al., 2016), etc. Similarly, the MOOC-related public sentiments can be mined to understand the opinion of the crowd as MOOC users actively use social media (Delgado-Kloos and

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Munoz-Orgarano, 2014; Kravvaris et al., 2016). Twitter can be used as a competitive intelligence source to discover the customers’ sentiments about a brand and its competitors in real-time (Jansen et al., 2009). The high speed (140 characters), open community, and asymmetric nature of Twitter allows the tweets to be visible by a wider user base and makes it easier to capture the dynamics of interaction among users, unlike other available social communities. Since MOOC users actively use Twitter to share the topics, question-answers, etc., their sentiments can be captured, and the public opinions regarding MOOCs can be mined.

Many researchers (Chen, 2014; Enriquez-Gibson, 2014; Shen and Kuo, 2015; Rui et al., 2013; Wen et al., 2014; Xia, 2014) have performed text mining on MOOCs from social media data, but they are mostly based on generic MOOC-related keywords or one-or-two MOOC providers. There is little research from the perspective of both MOOC users and providers such as, how MOOC users perceive and engage in social media and how MOOC providers keep their users engaged. The present study aims at seven major MOOC providers namely, Codecademy, Coursera, edX, Khan Academy, Skillshare, Futurelearn, Udacity, and examines (1) the temporal trends, i.e., daily, weekly, and monthly trends of MOOC providers’ related data from Twitter, (2) Association rule mining of tweets to find interesting patterns, (3) Sentiment mining of tweets and categorizing them into positive and negative opinions, (4) Influencer analysis, and (5) Engagement analysis from the provider side.

This paper is structured as follows: Section 2 presents the literature review; Section 3 gives the details of the research framework. Section 4 presents results obtained followed by the discussion in Section 5. Lastly, Section 6 presents the conclusion of the study, limitations and future scope of research.

2. LITERATURE REVIEW

Fundamentally, MOOCs are classified into Connectivist (or cMOOCs) and institutionally focused extended MOOCs (or xMOOCs). cMOOCs follows the principles of connectivism—autonomy, diversity, openness, and interactivity (Bell, 2010; Daniel, 2012; Kay et al., 2013), for example, EduMOOC, CCK 08, 09, 11, etc. On the other hand, xMOOCs follow the similar pattern as on-campus courses, for example, coursera, edx, udacity, etc. xMOOCs are one of the interesting subjects to study because they involve on-campus delivery pattern at nearly free of cost and is offered to a larger mass. Although xMOOCs would not replace the traditional education, they would complement it and provide people with lifelong education (Hollands and Tirthali, 2014).

The rise of internet usage in daily lives has brought a new opportunity to include the online interactions among people in education. People share information, collaborate, and participate in social media to create and use information. Whiting and Williams (2013) through an exploratory study have identified ten uses and gratifications for using social media. They are social interaction, information seeking, pass time, entertainment, relaxation, communicatory utility, convenience utility, expression of opinion, information-sharing, and surveillance/ knowledge about others. With around 695.75 million1 registered users and 58 million1 average numbers of tweets per day, Twitter is one of the most used microblogging sites. The open nature and its access through APIs make it lot easier to analyse the tweets (Russell, 2013). Apart from connectedness, the features such as brief about personal life activities, real-time information, RSS feed, the brevity of tweets, pervasive access, broadcast nature, etc. make Twitter a better place for the users to be in (Java et al., 2007; Zhao and Rosson, 2009). Moreover, Students positively perceive the integration of Twitter with online learning platforms recognising it as a powerful tool which would help to bring new information from the conversations in a closed learning environment (Thoms, 2012). Twitter, when used as a tool to complement traditional learning increases the engagement and satisfaction of students (Rinaldo et al., 2011).
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