

MOOC e-Learning Environment: An Effective Tool in Information and Communication Technology

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ABSTRACT

The rapid development of Information and Communication Technology (ICT) is more widely influencing all human beings, in professional and private lives. ICT and its applications are interacting with environments, roles, and processes of social and psychosocial change. New solutions are evolved through computer based learning and e-learning are opened. This blended learning with computer based learning in the MOOC e-learning environment. This is an effective tool for teaching and learning. The Sentiment analysis is the field of Language Technologies which can deals with unstructured data/ text. The information may consist of users' emotions, feedbacks, reviews, and personal experiences. In this research a novel Ontology-based Sentiment Analysis Process for Social Media content with different sentiments is presented. The social media content is automatically extracted from the twitter messages. An ontology-based process is designed to retrieve and analyse the user tweet with sentiments.

E-learning in the MOOC e-learning environment is one of the very perspective solutions for lifelong learning. A combination of technologies for twitter extraction, data cleaning, subjective analysis, ontology model building, and sentiment analysis are used. The results from this analysis could be used by the company to take corrective measures

Keywords: MOOC, Text Mining, Opinion Mining, Sentiment Analysis, Information and Communication Technology.

INTRODUCTION

In the global changing environment, technology, economy, norms/values and labor market are responsible for changing extensively at a global level. The impact of rapid development of Information communication Technology (ICT) on all aspects of the society is described in the Convergence Model on ICT and psychosocial life environment (Figure 1). The globalization, ICT, Life Environment and Life role have an extensive connection and interrelation between each other and are responsible for effecting the human. The Networking between the components are responsible for e convergence and integration of processes on various levels of analysis [4].

Converging circles graphically reflect the ongoing processes. The converging technologies such as computer technology, tele-technology and media technology are responsible for the change. The convergence process enforced them time to time by smaller, cheaper, and more powerful technical

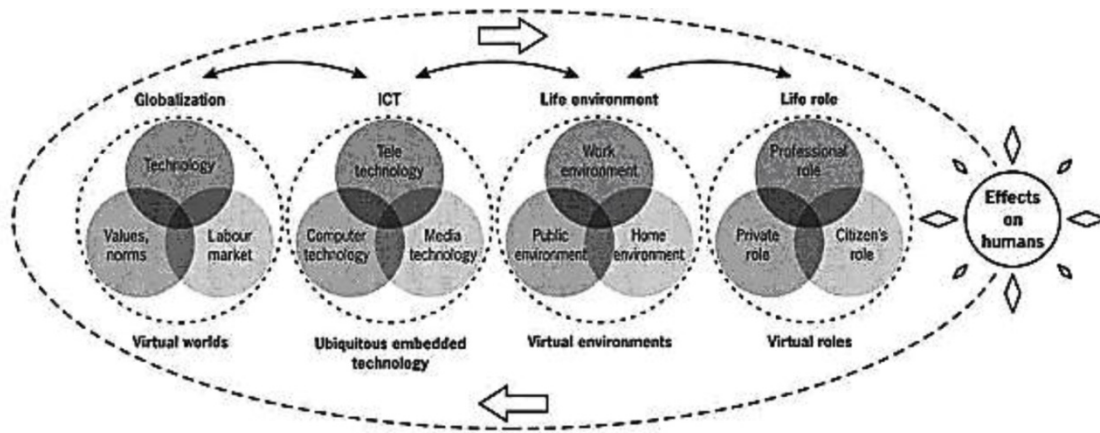


Fig. 1: Convergence Model on ICT

components for implementation. ICT is extensively being used in almost every activity and embedded into more and more activities and processes (ubiquitous computing). Both Convergence and Interactions are important features in the convergence model. Convergence means to go forward or to move towards a common content. Interaction means that technology interacts with the social world with values and beliefs. There is an interaction between the “clusters of circles”. There are four levels of analysis – individual, organizational, community, and societal [8]. In the following, the main constituents of the convergence theory in Figure 1 are presented. The important key processes in the model are Convergence, Interaction, Participation, Psychosocial processes, Globalization and Democratic processes. Complexity characterizes these processes. The convergence model implements accessible information for creating and enhancing educational applications. Information and communication Technologies (ICT) are widely believed to offer new options for Web mediated courseware design. Multimedia and online courseware development accentuates a belief that highly graphical (or visual) delivery media will meet the individualized instructional requirements of diverse student cohorts [7].

Effects on humans are becoming more multifaceted and complex [8]. ICT integration supports thinking through differentiation which is supported by collaboration.

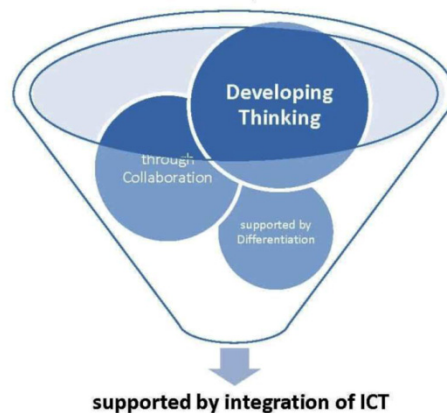


Fig. 2: Integration Approach of ICT

The Three of the bubbles are there for the supports the integration of ICT. The emerging use of ICT is based on the developing thinking of the individuals, collaborations of the people and the documents. The use if ICT thus creates the differentiation among the members and the nation. Also, the levels of integration can think for the four levels of analysis – individual, organizational, community, and societal. ICT cannot be possible without 3C's i.e. Computer, Content and Communication. The integration of all the 3Cs is possible because of Local Area Network, Computer Software and Broadcasting. The integration of all 6 components is nothing but the responsible for invention of ICT i.e. World Wide Web as shown in Figure 3.

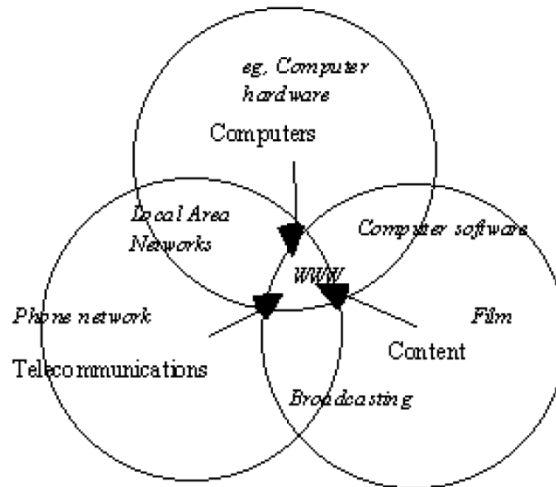


Fig. 3: 3C's ICT Model

Massive Open Online Courses (MOOC) have gained momentum in innovative way of increasing access and equity in education. McAuley, Stewart, Siemens, & Cormier (2010) claim that “The large scale of the community, from several hundred to several thousand participants[10], maximizes the possibility that the “long tail” effect will enable someone with even the most esoteric interests within the overall focus of the MOOC to find people with whom to share and collaborate”[5.6]. Thus, MOOC have wide implications on how education will be perceived in the future. Although ICT play a major role in the delivery of MOOC, it might not be a defining one. As such, the two camps are partially divided when it comes to which is the best way forward. Affirming this, Daniel (2012) argue that “...what MOOCs will not do is address the challenge of expanding higher education in the developing world [11]. It may encourage universities there, both public and private, to develop online learning more deliberately, MOOC courses may find their way, alongside this division results in confusion among the stakeholders as they are now faced with a difficult choice in terms of organisational, institutional or national policy. In an attempt to identify the extent of this dilemma, this research paper looks at the sentiment of the public (stakeholders) with respect to MOOC.

The sentiment analysis of user's social media data is very important in the present day business scenarios. Users share information about products, services and their experiences on social media. This information can be used for market research, product feedback and analysing customer service effectiveness. Bing Liu explained that opinions are subjective expressions. Opinions describe people's sentiments or feeling towards entities, events or their properties [1]. The sentiment analysis of the

opinions could lead to many interesting results. The dynamically expanding web and social media are generating huge amount of opinion data. People's opinion about any product or service on social media is a very valuable asset for any organization. The organizations can generate information on customer's response, or its behaviour for any product or service, by doing the sentiment analysis of these social media data.

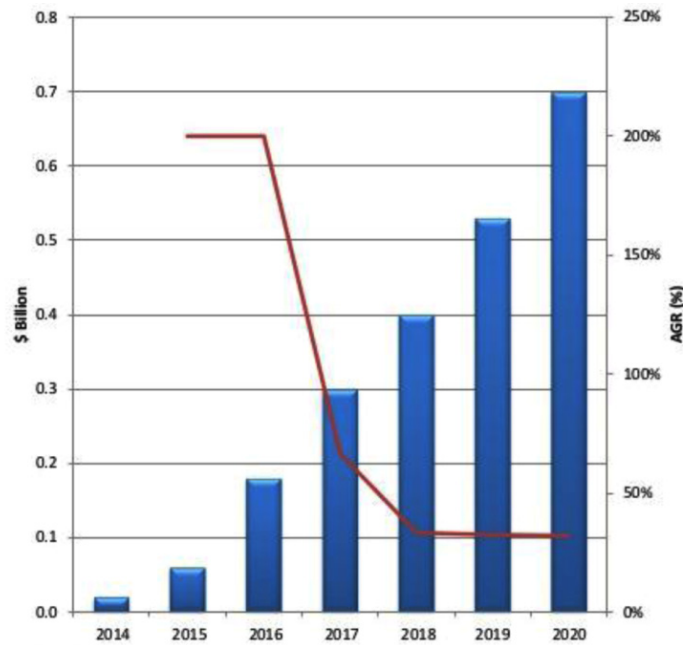


Fig. 4: Latin America MOOC usage 2014-2020

Mike Thelwall, Kevan Buckley, Georgios Paltoglou, and Di Cai presented an algorithm for understanding the sentiment associated with the short text [2]. The users' shared informal text or sentences convey different emotions on 'likes' and 'dislikes'. They developed algorithms to identify the sentiment and the sentiment strength in these informal communications. Janyce Wiebe and Ellen Riloff showed a technique for creating subjective and objective sentence classifiers from unannotated texts [3]. They tried to develop a system to analyse text and find out opinion or emotions associated with it. They suggested a method for classifying subjective and objective information from a sentence. This subjective and objective information can be used to develop different models, which can be utilized to answer a customer based on their behaviour.

BUILDING AN SENSITIVITY MODEL

The process of building an ontology model is shown in Figure 4. The data is to be extracted from the social media platform, Twitter. The script written in R software is used to extract the tweets for e-learning MOOC post and to clean it. Again data cleaning is performed with R software on the tweets to remove tweets with hyperlinks or any other special characters. The MOOC domain with its class, object and object properties are used to build sensitivity model. H. Cunningham, et al. showed a methodology to do text parsing using R software [9]. The subjective analysis of tweet data

was done to identify the objects and their object properties for the MOOC domain. A combination of R-based language parsing is used for annotating the nouns and verbs in the tweet. The output of the R software was in a tag form with nouns and verbs enclosed in tags. Data cleaning was done to get the nouns and verbs from the results. The script written in R was used for data cleaning. The data after cleaning had redundancies of noun and verb. These redundancies were removed by using R software. The final results had only nouns and verbs from tweet texts.

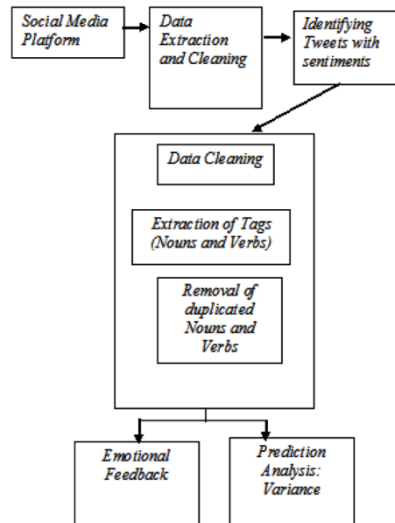


Fig. 5: Flow Chart for Proposed Analysis

The sentiment analysis was done using the R analytical software application which comes in the form of application. In preparation for analysis, an identity column was added to the dataset to enable the analysis of individual tweets with respect to sentiment. A basic sentiment analysis was conducted on the dataset using the Semantic analysis on MOOC as a dataset of 1500.

ANALYSIS AND RESULT

With reference to Figure 6, it can be seen that there is relatively more discussion taking place on the topic of MOOC in terms of emoticons comparison. As shown in Table 1, the total number of distinct tweets on MOOC for a 1500 tweets. It shows that 82.6% has positive emoticons, 11.6 is negative emoticons and 6% as neutral emoticons. The interest in MOOC is on the rise. There may be several factors contributing to this trend. Among them, the novelty of MOOC, the involvement of the private sector, the brand names associated with the recent MOOCs delivered, the keen interest of highly reputed conventional institutions in the concept and the large marketing budgets could be key influences for self-learning. Lexicon features Words listed the MPQA (Multi-Perspective Question Answering) subjectivity lexicon (Wilson, Wiebe, and Hoffmann 2009) are tagged with their prior polarity: positive, negative, or neutral. We create three features based on the presence of any words from the lexicon. Part-of-speech features for each tweet, the features for counts of the number of verbs, adverbs, adjectives, nouns, and any other parts of speech. They are categorized in category 'joy', 'surprise', 'disgust', 'sadness', 'fear' and 'anger'. The words fall under the category are shown in Figure 7.

CONCLUSION AND FUTURE DIRECTIONS

Our experiments on twitter sentiment analysis show that part-of-speech features may not be useful for sentiment analysis in the microblogging domain. More research is needed to determine whether the POS features are just of quality due to the results of the tagger or whether POS features are just less useful for sentiment analysis in this domain. Features from an existing sentiment lexicon were somewhat useful in conjunction with microblogging features, but the microblogging features (i.e., the presence of intensifiers and positive/negative/neutral emoticons and abbreviations) were clearly the most useful. Using hashtags to collect training data did prove useful, as did using data collected based on positive and negative emoticons. However, which method produces the better training data and whether the two sources of training data are complementary may depend on the type of features used.

Our experiments show that when microblogging features are included, the benefit of emoticon training data is lessened. This shows that Massive Open Online Courses (MOOC) has positive emoticons. It have been used as the positive. Given that both OE learning Platform for everyone. MOOC is pervasive force which can change the education landscape of the future. Three main trends can be identified which need to be taken into consideration by the stakeholders when making a policy decision: (i) there is an increasing amount of interest on MOOC; (ii) the public still hasn't formed strong opinions regarding MOOC due to the novelty of the ideology; and (iii) the positivity towards MOOC is growing. This paper discusses the preliminary analysis of the data. It is my intention to further probe the data and identify the reasons behind the trends identified in this paper. The next step is to potentially pinpoint certain phenomena which would have a positive or negative impact on the public opinion with respect to MOOC can be addressed

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