Issues and Challenges in Social Networks for Recommender System in E-Learning: A Survey

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Abstract: **With the rapid evolution of information and communication technologies (ICT), e-learning has become one of the major trends in web based learning. Nowadays, learners in an e-learning system are into virtual education environment in which they do not need others assistance in the process of learning. The role of social networks in e-learning is supportive and important. Social leaning occurs when a group of individuals interact to support each other in learning process using any media; one of them is social media. It is required to meet every learner's individual needs through highly personalized recommendation system. This paper focuses on discussion of various works carried out on the importance of social media for a recommender system in an e-learning environment.**

Keywords: **e-learning, social media, recommender system, ICT, web based learning.**

I. INTRODUCTION

E-learning can be defined as electronic learning that consists of acquisition of knowledge by using computer and internet base courseware [3]. With the exponential growth of educational resources available on World Wide Web, information overload has become a crucial challenge. The main characteristics of e-learning systems are their ability to recognize learners' needs, behaviour and also their capabilities. These systems should be able to provide the appropriate recommendations to improve the efficiency of the learning process.

Conventional learning management systems(LMS) are commonly adopted as formal teaching and learning environments[17]. In traditional learning design, the source of knowledge is from the instructor, the design of learning process is basically teacher centric and all the instructions occur from teacher to student. With the growing interest in e-learning the means of education is changing from traditional class rooms to distant learning.

Nowadays, social media networks such as Facebook, twitter and Google+ became very popular. Social media networks have a great effect on people life. They can be accessed very easily by PCs or mobile phones. There is a growing interest in the adaption of new sources for the personalization of the various learning experiences. The role of social media to enhance e-learning experience through personalized recommender systems is of research interest.

Social networking is a resourceful, intelligent and interactive automation of connecting people for effective knowledge dissemination. Teaching and learning process takes place on social media including wiki, YouTube, Facebook, twitter thereby encouraging knowledge sharing and feedback [2]. The information gained from the data analysis of the behaviour of the users on social media will improve the ability in personalization and adaptation of course content in online learning systems. A goal of personalized e-learning includes "automatically or semi-automatically identifying learning contents that match the needs and preferences of the learners. Every individual learner has their own learning styles, goals, previous experience and varied cognitive capabilities. To identify information that suits the learners needs in terms of their prior knowledge level, preference, learning style, learning personalities and so on, building personalized recommendation systems in e-learning have been researched extensively. This paper is a study on importance of social media for the recommendation systems in an e-learning system in order to create personalized leaning environments for the learner.

II. RELATED WORK

Many research papers which focus on the importance of social media for e-learning have been surveyed. Few of such works carried out has been highlighted in this section.

[2] Employs a discussion on the importance of providing social network-based educational systems that promotes and enhances learning by leveraging on web technologies. It is also identified that in traditional learning design the learning process is basically teacher centred and all the instructions occur from teachers to students. Students are designed to be passive listeners A social network was designed using Unified Modelling Language (UML) and implemented using open source software primarily to connect students and teachers. The system was designed to provide a platform that increases effective social connections and interactions. The system makes the learning process more appealing for students. The social network for educational learning provided in this study is considered as a paradigm shift from the traditional e-learning system by integrating educational services with social networks to enhance learning.

Authors in [3] conducted an in-depth investigation to analyse the impact of social networks on students for enhancing their e-learning experience. The investigation for a group of students at an University was through questionnaire and interviews where the student opinions were collected regarding the use of social networking techniques for enhanced e–learning. The research work explored the various ways in which students can use social networks also the results showed that most of the students strongly believe in making use of social networking features to enhance the e-learning.

In [1], it is considered that determining learning styles of students would lead to enhancement of e-learning experience. The determination of learning styles of students was by making use of Felder-Silverman model. To determine the learning styles social media analysis was carried out and students learning styles were classified dynamically. Then it was suggested that course presentation should differ according to student learning style and which group does they belong to.

Authors in [9], developed a framework called Self-Adaptive learning through teaching (SALT). The framework SALT was modelled as an online social network similar to Facebook network site. In this system the goal was to engage users in learning through teaching process hence the system combines the concepts of crowdsourcing, online social networks and complex adaptive systems. The SALT system allows anybody to author educational contents, learn the contents as well as the users can interact with their peers as in any social network. Experiments were conducted and evaluated to explore how students group together and to determine successful learning pathways and how recommendation algorithms can be used in SALT settings for adaptive social learning.

Work carried out by Surong Yan et al.[10] infers that, to improve the accuracy of a recommender system social networks can be used as additional inputs. To manage the complexity of adding social relational networks to recommender systems a new approach has been proposed. For each user the individual relationship network is defined based on similarity, density and confidence measures to control the relationship propagation and contracting. The proposed recommendation approach improves the accuracy by adaptively handling the trade-off between individual preferences and experiences and social influence. The evaluation results showed that the proposed approach achieved a better prediction accuracy and scalability.

For [4], authors discussed the E-xcellence methodology that has been developed to support assessment of quality of e-learning. Benefits and challenges of online communication in education have been highlighted. Also, an overview of updates that can be made to the E-xcellence manual is provided i.e., benchmark and performance indicators on curriculum design, course design and student support, encompassing social networking. It was claimed that E-xcellence manual in relation to social networking should be valuable to all higher educational institutions which is e-learning.

Authors of [7] carried out a research with the goals of demonstrating a workflow of social media data sense-making for educational purposes which integrates both qualitative analysis and large scale data mining techniques. Also, it explores engineering students' informal conversation on Twitter, in order to understand issues and problems they encounter in their learning experiences. In this work, it requires human effort for data analysis and interpretation. They highlighted the future need for a tool for combining social media data and academic data.

For [13], it discusses the literature analysis on developing online learning resources (OLR). The perspective for online learning resources to achieve pervasive knowledge through cloud computing and social network has been expressed. It is also highlighted that social networks are important to encourage knowledge sharing and OLR should be extended by accommodating students' opinion by enabling them to participate more actively in the information and generating knowledge through social media. It is claimed that a learning process can benefit from connecting students through various social networks, tracking students' comments, opinion or suggestions an then approach them with more personal touch.

Authors of [16], considered the development of blended learning models and it is highlighted that these models should be in line with the recent changes in e-learning which emphasises a student centred approach. In this work a blended model was developed which combines Learning management system, a set of web 2.0 tools and e-learning activity recommender system (ELARS) to enhance personalized online learning. The research determined that the model increased the students' effectiveness inn e-tivities. In their experiments students were allowed to use tools like blogger, google+, google drive etc., that suits their preferences and for collaborative e-tivities students were allowed to form their own groups. The evaluation results confirmed that proposed model I effective in a rea setting and students were satisfied with it.

[5] Presents a discussion on potentials and challenges on social media learning. It is mentioned that even if data collected within LMS closely reflects the interaction of learners within a system, modern distributed networks and the physical world present additional challenges to be addressed. It is important to consider the learners sharing their learning and social achievements on social media and social network sites to increase engagement and visibilities. It is also mentioned that various student activities such as tweets, blogs, learning evaluations and social networks can enhance the

abilities of online earning system to understand students' preferences and online behaviour.

III. ISSUES AND CHALLENGES

In this section some of the issues and challenges recognized through this literature survey are discussed.

Many of the research works recommend for validation of social recommender systems using statistic approach as a tool to measure the quality of the model [8]. Many authors also highlighted that preserving privacy while employing social networks should be considered. Some experiments show that categorizing social roles in both real world and cyber world for decision making improves the efficiency of the system [11]. Many frameworks have been implemented which automatically recommends items to users but a series of experiments with those systems are recommended for validation [12]. Some of the works also propose considering new hybrid knowledge-based techniques to suggest resources taking into account characteristics of cognitive student's applications and data sets in the context of social network [14]. There is scope for utilization of tools for combining social media data and academic data [7] . It is also proposed that the more activities should be considered in the determination of students learning styles for accurate results which would lead to enhanced course personalization and presentation [1].

For social recommender systems trust relationship of users in social network is considered to be significant. It is recommended to consider that trust relationship of users being invariant. That is, trust relationship can change with time. Hence it is required to involve the time sensitivity for trust aware recommendation [15].

Further, some researches insist on including lecturers as well as other staff members in order to understand how they feel about social learning systems [3]. One more research direction is to embed online learning resources with multiple sources like social networks, big data and semantic web through the support of cloud computing in order to achieve competitive advantage and pervasive knowledge.

IV. CONCLUSION

We have presented a survey carried out on importance of social media for recommender systems in E-learning. From this study, it can be concluded that social media plays a vital role in enhancing the personalized learning experience for the learners. Since there is a paradigm shift in the learning process from teacher centric to learner centric, along with the LMS, social interactions of the learners can also help to understand their preferences. In this direction,

many frameworks have already been proposed as social recommender systems for better understanding of learners' needs. Lot of research works have been carried out in this regard and still there are many open issues to be addressed as discussed in the previous section.

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