



AN OVERVIEW OF CLUSTERING TECHNIQUES OVER E-LEARNING ENVIRONMENT TO IMPROVE PERFORMANCE OF EDUCATIONAL SYSTEM

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ABSTRACT: E-Learning systems are most growing technology in today world which enables users to learn things without visiting schools, colleges or libraries. There are lots of webinars are available in the internet which can be utilized by the students or researchers to learn and find the solutions. The main issue present in the webinar based learning system is finding the most relevant webinars that are required would be difficult. This is so hard to find the relevant webinars which is in the audio format. To resolve this kind of issues, there are various researches has been conducted by different researchers in terms of finding and grouping the most relevant webinars together which might be more helpful for the students to learn more facts. This analysis work mainly concentrates on discussing deeply about the various research works which has been proposed earlier to resolve different problems. Those analysis works has been discussed deeply in terms of their working procedure with the merits and demerits of those methodologies. Finally these methodologies have been compared with each other to predict the better methodology that can be used further for finding the more relevant webinars.

Keywords: E-Learning, Webinars, Relevance, Clustering, Accuracy

I. INTRODUCTION

E-Learning system is most growing popular field in the real world environment which replaces the class room into the digital environment. This new system eliminates the need of maintain high tech class room and student well environment. This system enables students to learn their subjects at their convenient time whenever they require. This E-Learning system can improve the student's performance in the considerable manner than the traditional teaching methods. It also enables to include the new form of technologies and information into the learning system thus the well developed professional environment can be formed for the students.

E-Learning systems can be delivered in two ways. Those are audio type and the video type. Both these system make ease of student learning process by providing them virtual environment. Providing videos and audio type of webinars improves the student's skill by acting as



powerful intimidators. There are various new technologies has been incorporated with e-learning system to provide the most attractive and powerful webinars to the students. This attractive webinars leads to the focus of various students in this field to find and look out for their contents.

These are various organizations which creates the webinars which is accessed in the E-learning system by various students. These webinars provides different meaning and contents that belongs to different fields. Students who learn via E-Learning systems will find the webinars that satisfies their interest by submitting their interest through key words. The webinar contents that match with the key word would be retrieved as their resultant content.

Clustering is the one of most important field data mining field which attempts to find the group the most similar contents together. There are various clustering techniques are available which attempts to group similar contents based on their similarity. They often differ from their working procedure and functionality. Similarities of the relevant contents are calculated by using different distant measures such as Euclidean distance, Manhattan distance and so on. These clustering techniques are utilized in this work to find and retrieve the most relevant and similar webinars to the users based on their requests.

The contribution of this research work is to analyse the various methodologies and techniques introduced in the previous research works in terms of their working procedure. The benefits and drawbacks of those clustering techniques are analysed and discussed deeply to predict the most suitable technique that can be utilized for the further research works to improve the performance of the webinars. Finally all the

discussed methodologies were compared with each other to find the better method that can perform webinar based clustering effectively.

The overall organization of this research work is given as follows: In this section detailed introduction of the e-learning and the clustering methodologies is given. In the section 2, deep discussion of the previous research works has been given. In section 3, numerical evaluation of the various proposed research methodologies is given. Finally in section 4, overall conclusion of this research work is given with better method that can be well utilized for the further research work.

II. RESEARCH ANALYSIS

In this section analysis of the various research methodologies proposed by various researchers are discussed in the depth manner. Each and every methodology is presented with their working procedure to deal with the different scenarios.

E-Learning make ease of teachers from the teaching difficulties by providing the audio and visual based teaching scenario to the students. However, this systematic learning system is not proved to be better in terms of student knowledge gain. Chih-Ming Chen et al [1] focused on this issue and proposed a novel approach that attempts to measure the performance assessment of students in terms of learning skills. This performance assessment would be more difficult process which would require various more relational factors of learning system such as students skills, their ability value, understand ability of the webinars and so on. The author addressed this complexity by combining Gray relational analysis (GRA), K-means clustering Scheme, fuzzy association rule mining, and fuzzy inference methodologies which make ease of the learning process. The



performance evaluation of this result proves that the proposed methodology of this work leads to the better environment for learning the performance assessment of students.

Luisa M. Regueras et al [2] analysed the various E-Learning competitive tools that focus on improving the higher education student's skills. To achieve this author proposed the novel tool namely QUEST which is an innovative tool that attempts to reach the competitive and cooperative learning skill from the available webinars. This Quest system deliver the more improved webinar to the higher education students by combining the best learning skill from the various web sources. The main goal of this system is to improve the student's performance skill by using the information like students enquiry details, their level of involvement and communication terms between the students and teachers. The performance evaluation of this work proves the E-Quest system can able to collect and combine the useful learning resource from the various systems in terms of improvising their skills.

Svetlana Kim et al [3] attempts to create a dynamic environment that can act as useful and flexible user interface, thus the students can find their required webinars from available set of webinars. It creates a ubiquitous learning environment to improve the learning skills. This ubiquitous learning environment would combine the various sources such as learning collaborators, learning contents, and learning services which lead to the better E-learning system. This dynamic environment creation allows users to find their interested webinars from the web by submitting the key words dynamically. In this work two systems are proposed namely, collaborative adaptation system and personalization learning system. Personalized support for learners even more important, when E-learning takes place in

open and dynamic learning and information network. Sometimes, users might prefer "emotional decision" to select their interested learning contents. The situation encourages the need for the personalized contents in order to provide the user in the best possible experience.

Francesco Colace et al [4] improves the learning skills by constructing the ontology through which the conceptual meaning of the user's submitted key words can be identified, thus the retrieval of webinars that are related to the user requirement can be done accurately. This webinar retrieval leads to the successful and flexible learning environment. Initially ontology for the various domains would be constructed in which user key words would be compared with each other in terms of different learning parameters. The user key words that are gathered would be pre-processed and formalized and the different meaning of those similar key words would be identified. Various parameters that are focussed on finding the learning parameter values is evaluated in the simulation environment and finally results of this work proves to provide the valuable service to the higher education students.

Mario Muñoz-Organero et al [5] attempts to improve the E-Learning environment reputation level by personalizing the E-Learning environment by adding the interests of the users with the webinar search based system. This E-Learning system enables users to submit their interested key words which would be stored in the database. This database would be updated periodically to maintain the up to date maintained database through which personalization based user retrieval can be done effectively. This personalized environment leads to the improved user's satisfaction level by retrieving the webinars that are mostly required by the users in terms of various computational costs. The authors analyze



current trends in e-learning architecture evolution and identify merits and limitations. They also describe a new architecture that captures the needs of both formal (instructor-led) and informal (student-led) learning environments.

Mohd Anwar et al [6] incorporated the privacy mechanism into the E-Learning environment to ensure the trusted environment for the users. This is done to protect the user's sensitive information such as their identity information, webinar they preferred and so on from the third party intruders. This task of maintaining the sensitive information leads to the more computation and storage overhead. However this mechanism provides the trusted environment, thus the users can search and retrieve their interested webinars without revealing their identity information. This reliable and trustworthy model would leads to increase in the reputation transfer value. This reputation transfer value is differs among various users based on their satisfaction level.

Pedro J. Muñoz-Merino et al [7] performed comparison analysis to find the performance improvement of the E-Learning environment by comparing it with the teaching based learning method. This is done under various metrics to know the improvement. Human teaching capability is compared with the hinting based computer system through which one can learn the skills effectively. The performance comparison analysis leads to the evaluation of the different metrics from which it proved that the computer based learning system can lead to the better performance improvement than the human teaching method. However computer based system lacks from understanding the student character whereas human based teaching can understand the

students thought based on which teaching can be varied.

Human teachers have usually been considered as being very good at providing hints. Suebnukarnet al [8] suggested that the reason for the success of a human teacher with respect to a computer is that humans do not provide the solution directly. They judges the quality of a computer-based tutor by assessing the similarity between the number of hints generated by the tutor and by a human. However, the conditions of the research reported here are different: The hinting contents of the tutor are initially set by teachers, and there is a comparison of learning gains.

Martin et al [9] proposed a hinting software module was implemented within XTutor. This hinting module tries to combine most of the non adaptive functionality present in state-of-the-art hinting systems with other functionality based on new ideas, such as a new scoring method with penalties or rewards for hint resolution and for viewing hints, previous meta-information about the hints, a maximum limit of hints to select, or an undefined level of nested hints between problems.

Anwar et al [10] told trust is essential to successful collaboration among learners. Online collaboration can cause stress depending on the level of the collaborators' mutual trust. If trust is not present in a relationship, a large amount of energy is wasted in checking up on the other's commitments and on the quality of their works. In a learning environment, various key relationships of recommender-recommendation seeker, peer-peer, helper-helpee, and mentor-mentee are formed based on mutual trust. Privacy concerns are inherent in a collaborative environment. The privacy concerns in collaborative systems originate from individuals' desire to control how one is perceived by another.



In a high-risk or low-trust environment, we may need to require multiple guarantors to work together to address any bad acting. We realize that users may be able to defeat our reputation management system by colluding with the guarantor(s). However, this is an inherent problem in or alimitation of any reputation system, in general any system that uses any type of third party information. One way to address the collusion problem is to ensure the credibility of any trusted third party involved in the gareer et al [11] work. Since our guarantor mediated reputation system is situated in a learning environment, we assume that none could be more credible to learners than an instructor. Therefore, an instructor playing a guarantor role is unlikely to collude with some learners to game the reputation system.

III. NUMERICAL EVALUATION

In this section, comparison evaluation of the different methodologies is done in terms of ability and performance improvement of E-Learning environment. This is to find the different ways that can be more useful in improvement of the E-Learning environment. The important metric that is used to analyse the performance improvement of different methodologies is accuracy.

Accuracy is defined as the how well the user required contents are retrieved to the users that are most similar to the keyword submitted by users. Accuracy of the proposed methodology should be high for the flexible and better E-Learning environment. The comparison charts of different methodologies are illustrated as like as follows:

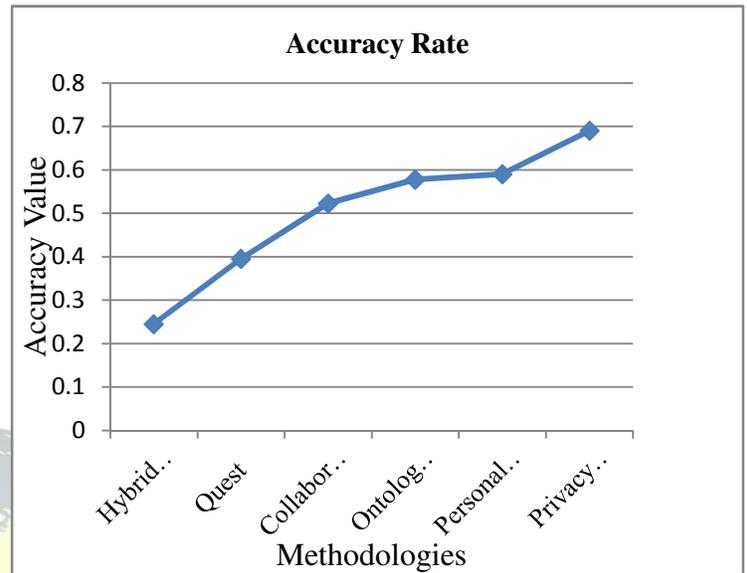


Figure 1. Accuracy Comparison

IV. CONCLUSION

E-Learning system is most popular field in the real world environment which systemizes the teaching environment by replacing the human based teaching system. There are various mechanism are proposed earlier which attempts to retrieve the webinars that most relevant to the students requirement to satisfy their needs. In this analysis work, different methodologies that are proposed in terms of the retrieving the student required webinars are discussed. The working procedure and the merits and demerits of those works have been given in this analysis work. Final evaluation of this work in terms of performance metric called accuracy rate from which it is proved that the privacy aware methodology is proved to provide better solution than other methodologies.

REFERENCE

[1] Chih-Ming Chen, Yi-Yun Chen, and Chao-Yu Liu, "Learning Performance Assessment



Approach Using Web-Based Learning Portfolios for E-learning Systems”, IEEE transactions on systems, man, and cybernetics—part c: applications and reviews, vol. 37, no. 6, November 2007

[2] Luisa M. Regueras, Elena Verdú, María F. Muñoz, María A. Pérez, Juan P. de Castro, and María Jesús Verdú, “Effects of Competitive E-Learning Tools on Higher Education Students: A Case Study”, IEEE transactions on education, vol. 52, no. 2, may 2009

[3] Svetlana Kim and YongIk Yoon, “Multimedia collaborative adaptation middleware for Personalization e-learning”, The 2009 International Symposium on Collaborative Technologies and Systems (CTS’09) May 18-22, 2009, Baltimore, Maryland, USA

[4] Francesco Colace, and Massimo De Santo, “Ontology for E-Learning: A Bayesian Approach”, IEEE transactions on education, vol. 53, no. 2, may 2010

[5] Mario Muñoz-Organero, Pedro J. Muñoz-Merino, and Carlos Delgado Kloos, “Personalized Service-Oriented E-Learning Environments”, IEEE internet computing, 2010

[6] Mohd Anwar and Jim Greer, “Facilitating Trust in Privacy-Preserving E-Learning Environments”, IEEE transactions on learning technologies, vol. 5, no. 1, January-march 2012

[7] Pedro J. Muñoz-Merino, Carlos Delgado Kloos, and Mario Muñoz-Organero, “Enhancement of Student Learning Through the Use of a Hinting Computer e-Learning System and Comparison With Human Teachers”, IEEE transactions on education, vol. 54, no. 1, February 2011

[8] S. Suebnukarn and P. Haddawy, “A Bayesian approach to generating tutorial hints in a collaborative medical problem-based learning system,” Artificial Intelligence Med., vol. 38, pp. 5–24, 2006

[9] K. N. Martin and I. Arroyo, “AgentX: Using reinforcement learning to improve the effectiveness of intelligent tutoring systems,” in Proc. 7th Int. Conf. Intell. Tutor. Syst., Maceió, 2004, pp. 564–572.

[10] M. Anwar and J. Greer, “Enabling Reputation-Based Trust in Privacy-Enhanced Learning Systems,” Proc. Ninth Int’l Conf. Intelligent Tutoring Systems (ITS ’08), June 2008.

[11] J. Greer, G. McCalla, J. Vassileva, R. Deters, S. Bull, and L. Kettel, “Lessons Learned in Deploying a Multi-Agent Learning Support System: The I-Help Experience,” Proc. Int’l AI and Education Conf. (AIED ’01), pp. 410-421, 2001.