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Automatic Detection Techniques to Detect E-Learners on E-Learning System: A Comparative Analysis

J. U. F. RAJPER, S. RAJPER[++], S. JALBANI, B.BALOCH*

Department of Computer Science, Shah Abdul Latif University, Khairpur

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Abstract: E-learning is an Information and Communication technology (ICT) weaved distance education. Users of e-learning systems have now paved into the era of web 3.0 after web 1.0 and web 2.0. But, still the e-learners' user modeling is a research demanding dimension. From personalized e-learning systems to Recommender e-learning systems, user modeling is required. For user modeling, e-learners' detection on web based learning systems are required. The objective of this study is to review the research studies in this most demanding research dimension of e-learning. This survey of research studies will be conducted to review past research studies from 2000-2016. The survey will be helpful to compare and classify the ADLS (Automatic learning styles' detecting techniques) and detect most robust techniques. Because it is revealed that to identify a robust technique for starting research study by researchers, scholars is very tedious and time taken job. This research study will contribute to scholars, academicians and e-learning community.

Keywords: E- Learning, E-Teacher, LMS, MOOCS, SAKAI,WEBCT , ADLS.

1. INTRODUCTION

E-learning can be classified into two major research areas, if it is classified as personalization, i.e., Adaptive systems and Intelligent tutoring system (ITS). e-learning 2.0 was called as merged philosophy of web 1.0 and 2.0 as it provided interactive web pages to the users, i.e., e-learners were provided with interactive online courses. While, to provide interactive online courses, the personalization of e-learning systems was introduced. Users' modeling is the essence of personalization of e-learning systems. User modeling of e-learners requires identifying and detection of e-learners during their online courses' activities to facilitate them accordingly. Many research studies have used different techniques to detect e-learners on e-learning platforms. This research study will review the past research studies from 2000-2016 to provide an analysis of automatically detection of e-learners on web based courses.

2. MATERIALS AND METHODS

Lot of work has been undertaken in the field of e-learning and so many techniques have been researched in past.. To conduct this research survey, research studies from 2000-2016 were studied in which various e-learning techniques. The study was undertaken by planning, conducting survey, extracting information and reporting conducted survey. **(Fig.1)** describes the flow of overall conducted study.

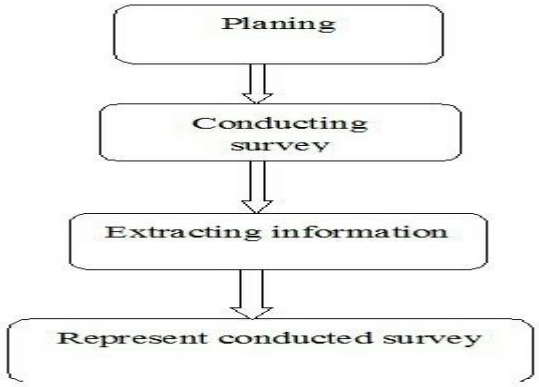

Fig.1 shows flow of conducted study

3. RESULTS AND DISCUSSION

Results for undertaken study are presented by various e-learners' detection techniques in e-learning systems .Some of the techniques summarized bellow:

3.1 K-Means algorithm

(Arain and Rajper 2016) proposed web log files for distance (DELMS) for different campuses of Shah Abdul Latif University Khairpur. The aim of study was to examine records of e-learners' activities by using web-log files that proved as beneficial for teachers to classify e-learners' according to their conduct and performance and also to design instructional strategies. As Data mining techniques divided into two fields; supervised and unsupervised learning techniques.

[++]Corresponding Author: samina.rajper@gmail.com
*University of Tando jam, Sindh, Pakistan

unsupervised (k-Means algorithm) technique had used in this study . By using clustering technique(k-Mean algorithm) they had gotten four clusters of e-learners which were enrolled in different campuses for two courses, such as:PAPR1 micro economics students were less active as compare to PAPR2 economics students. This study had shown fruitful results for the learners which belongs to rural areas.

3.2 Decision Tree

(Kalhoro and Rajper 2016) proposed an approach that was used to detect automatically learning styles of e-learners from the web-logs to accomplish their needs to improve e-learners' Data mining technique decision tree induction and kolb's learning style model was used to detect and classify e- learners in an e-learning system. Decision tree had taken pre-processed data sets and applying rules for detection of four learning styles of e-learners on LMSs. The precision values for four learning styles of Kolbs' model were:

1) Accomodator 0.658
2) Assimilator 0.5
3) Converger 0.574
4) Diverger 0.509

Conducted survey was designed for e-students registered in undergraduate courses. Students were 1100 from computer science and social science.(Brijesh and Saurabh 2001) presented data mining technique Decision tree to detect e-learners performance during learning activities ie; class test ,seminars ,assignments, genral proficiency, attendance and lab work) .the ID3 algorithm was used to obtain the data sets of 50 learners' of VBS Purvanchal University. Resultant information then extracted in the form of IF_THEN rules.(Maome) presented an agent system which was constructed automatically by applying DT model that was presented from the learning histories of e-learners' stored in data base to predicts e-learners' future state i.e,. Failed if marks >60, Abandon if learner gave up learning before examination, Successful if marks<60 and >80, Excellent if marks < 80)and then provide instructional strategies for instructors. Author compare modeled LMS with LMS without agent system.

3.3 Bayesian Network

(Maomi and Toshio 2007) Had constructed an agent system that built automatically learners' model by using Bayesian Network .Developed agent predicts e-learners' final status and also learners' on going history. In this study agent system do comparisons of moderate learners' learning processes with the learning processes of excellent learners and then genrates motivational messages .

Table1 Summary of E-Learning Techniques

Study	E-Learners's detection Techniques
(Ozpolat and Akbar 2009)	NB Tree classification with Binary Relevance Classifier
(Garcia 2007), (Ueno and Okamoto 2007),(Carmona and Castilo 2008), (Garcia 2008)	Baysian Networks
(Arain and Rajper 2016)	k-Means Algoritm
(Kalhoro and rajper2016), (Brijesh and Surabh 2011) (Ueno 2005), (Lu 2004) (Cristina, Gladys and Eva 2007)	Decision Tree
Dung and Florea 2012	Simple rules on matching hints
(Christos and Kyparisia 2007)	C-Mean algorithm

4. CONCLUSION

E-learning is very vast field.In the past lot of work had been done by the researchers. In this contacted study we had surveyed about e-learners' detecting techniques on e-learnings i.e,. decision tree, beyasian networks, k-mean algorithm, fuzzy c- mean algorithm etc.. which are used for e-learners' detection purpose in e-learning systems. By the end of undertaken survey we concluded that decision tree is most accurate technique for detection of e-learners in e-learning systems.

REFERENCES:

Abraham, G., V. Balasubramanian, and R. K. Saravanaguru, (2013). Adaptive e-learning environment using learning style recognition. International Journal of Evaluation (IJERE), 2(1), 23-31.

Ahmad, N., Z. Tasir, J. Kasim, and H. Sahat, (2013). Automatic detection of learning styles by using literature-based method. Procedia-Social and Behavioral Sciences, 103, 181-189.

Arain. S. G. and S. Rajper. (2016). E-learners' behavioral analysis using clustering Technique. International Journal Of Computer Science and Information Security, 14(10), pp.377-380.

Carmona, C., G. Castillo, and E. Millán, (2008) Designing a dynamic bayesian network for modeling students' learning styles. In Advanced Learning Technologies, ICALT'08. Eighth IEEE International Conference on 346-350. IEEE.

Christodoulopoulos, C. E. and K. A. Papanikolaou, (2007), October. A group formation tool in an e-learning context. In Tools with Artificial Intelligence, 19th IEEE International Conference on Vol. 2, 117-123. IEEE.

Dung, P.Q. and A. M. Florea, (2012) An approach for detecting learning styles based on learners' behaviours. In International Vol. 30, 171-177

Feldman, J., A. Monteserin, and A. Amandi, (2015). Automatic detection of learning styles: state of the art. Artificial Intelligence Review, 44(2), 157-186.

Graf, S. and T. C. Liu, (2010). Analysis of learners' navigational behavior and their learning styles in an online course. Journal of Computer Assisted Learning, 26(2), 116-131.

Khan, F. A., S. Graf, E. R. Weippl, and A. M., Tjoa, (2009), June. Integrated approach for the detection of learning styles and affective states. In Proceedings of the World Conference Telecommunications 753-761).

Kalhoro, A. A., S. Rajper. and G. A. Mallah. (2016). Detection of e-learrners': An Automatic Approach using Decision Tree. International Journal of Computer Science and Information Security, 14(8), 420-424

Lu, J., (2004) Personalized e-learning Material Recommender System. In International conference on Information Technology for application 374-379.

Ueno, M., (2005) Animated pedagogical agent based on decision tree for e-learning. In Advanced Learning Technologies, fifth IEEE International Conference on 188-192. IEEE.

Ueno, M. and T. Okamoto, (2007). Bayesian agent in e-learning. In Advanced Learning Technologies, 2007. ICALT 2007. Seventh IEEE International Conference on 282-284. IEEE.

Velusamy, B. and M. Anouncias, (2013). A Narrative Review of Research on Learning Styles And Cognitive Strategies. Journal of Theoretical and Applied Information Technology, 52(1).212-220.