Approach for using Learner Satisfaction to Evaluate the Learning Adaptation Policy

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ABSTRACT

The learning adaptation is a very important phase in a learning situation in human learning environments. This paper presents the authors’ approach used to evaluate the effectiveness of learning adaptive systems. This approach is based on the analysis of learner satisfaction notices collected by a questionnaire on a learning situation; to analyze the data the authors will use the space Density-based clustering algorithm of clustering applications with noise. This proposed approach aims to help managers of human learning environments to improve policy used in the learning adaptation phase for learners from the analysis results of collected data.

KEYWORDS

Adaptive Learning Systems, Clustering in E-Learning, DBSCAN, Human Learning Systems, Learner Satisfaction, Questionnaire

1. INTRODUCTION

Online education occupies a prominent place in the field of research since the democratization of information technology and communication; several studies conducted to improve the human learning systems (HLS), which made learner satisfaction their main objective. To achieve this goal, we must take into consideration all the elements that make up these systems Figure 1 such as: Domain model (Hu & Morrison, 2013; Kopeinik et al., 2014; Mendes, 2002), tutoring model (Murray, 1999; Nkambou, 2010) and learner model (Jeghal et al., 2013; Jeghal et al., 2014).

The HLS architectures vary from one system to another (Santoro et al., 2003), however they have common features, among them the adaptive learning tools. These tools aim to choose courses for learners; in order to adapt the learner’s learning needs, so they’ll be satisfied from the offered training.

The satisfaction of the learner in HLS is a very important factor for evaluate these systems. To determine whether a learner is satisfied with the training, most systems are based on the establishment of a questionnaire to investigate the participants in this training (Sun et al., 2008; Johnson et al., 2000; Gunawardena & Zittle, 1997), then from the analysis of the results, they can tell if learners are satisfied with the training or not.

The problem is how to analyze the collected results; several methods have been used in the literature among them, there are works that use the satisfaction rate and others who use the average value... etc.

Our idea comes from the analysis of the results of the questionnaire dedicated to know the satisfaction of learners; based on this analysis, we found two major problems that interrupt obtaining a good result:

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As a solution to these two problems, we propose to add a preprocessing phase to automatically eliminate the wrong answers that appear during the collection of the questionnaire results. This preprocessing phase is based on the classification of the questionnaire results that use the spatial clustering based grouping density applications with noise algorithm (DBSCAN).

Our approach is based on the analysis of results obtained from the questionnaire. According to learners’ satisfaction, we can say that our system has successfully chosen learners that have the same level in order to build a group.

It is impossible to say that the system came to select learners for a course, before processing the results obtained by these learners. The results must meet two conditions, so our approach is based on two criteria:

- The level of satisfaction between learners

  Learners selected for a course should be almost the same satisfaction i.e. value of satisfaction must be homogeneous learners except for special cases.

- The average value of satisfaction

  The average value plays a major role in informing us that the system has well selected the learners. The advantage of our algorithm is the elimination of wrong answer to get a good decision. The results eliminated, not forcing has bad results, but they have no similarities in group results. We decided to eliminate these results, so it will not influence our decision. In other words, we consider only the opinions of the majority of the group.

The rest of this paper is organized as follows: In section 2 we present the related work. In section 3 we describe our approach and the obtained result. Finally, we present the discussions in Section 4 and our conclusions in Section 5.
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