

## APPLIED CLASSIFICATION RULE MINING TO ENHANCE E-LEARNING IN THE CONTEXT OF EDUCATIONAL DATA

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**ABSTRACT.** In 21<sup>st</sup> century everyone is using internet to avail useful information or to extend their knowledge [8]. Percentage rate of educational contents or knowledge resources are also increasing day by day. In today's on internet where plentiful information and knowledge resource available but yet learners are not able to get benefits out of it. In this paper, I have introspect different factors that affecting behavior of the learner during online study. We know that at different level of education, learners want to explore online education to get benefits from it but still most of the learners are not able to access internet because some of them do not have experience to surf on Internet, searching skills also affecting the online learning capabilities. Technology and content quality are another issues. Without getting external support learner is unable to access online contents frequently. All these factors affect the way of searching over the WWW. To accomplish this research, we need to judge that how these factors affecting online learning, I have collected data of learners based upon their educational level through questionnaire, then with the help of datamining techniques [4]. I have reached to the productive result.

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## 1. INTRODUCTION

In review of different research, I have noticed that in most of the e-learning enhancement research, researcher used SPSS techniques, and now data mining techniques become a popular tool to solve statistical problems which involves factors, learners attitude towards online learning, and groups of respondents or cases that have similar properties to one another or they belong to same group and some attributes have different properties but they belong to the same group. In educational field, Educators has keen interest in developing educational contents and enhancing online learning platform to give learner a suitable platform for online learning. To produce robust and consistent solutions, it is imperative that researchers select desirable approaches to enhance e-learning. In my research, I have used: aa random sampling method: I have formed the primary sampling frame on google form and through survey collected the data of different learners and they belongs to different educational level.

<b>Educational Level</b>	<b>No. of Learners</b>
<b>Lower Primary</b>	<b>41</b>
<b>Upper Primary</b>	<b>92</b>
<b>High School</b>	<b>83</b>
<b>Higher Secondary</b>	<b>47</b>
<b>Degree(UG/PG)</b>	<b>152</b>
<b>Professional Course</b>	<b>205</b>

FIGURE 1

Data of Six hundred twenty learners were collected and distributed according to their educational level like LP: Lower Primary, UP: Upper Primary, HS: High School, HSEC Higher Secondary, Degree: (undergraduate and post graduate learners) and Professional Degree learners. We have judge the behavior of learners according to their behavior towards online learning. Each learner also been checked on the basis of different factors that affecting online learning like Activeness approach, technology support, Contents, External support. Along with these factors they are able to explore suitable contents which helps in their learning.

Questionnaire was used as research instrument in collecting the data and after applying SPSS statistical tool we haven't reached towards the productive result. Therefore I have applied different types of data mining techniques to estimate the behavior of the learners at different level of educational level towards on-line learning factors. After detail study of the learner behavior and judging the effect of different factors, we reach to the conclusions that, we need to apply a particular approach of data mining which gives us fruitful result in our study along with authenticate the findings of the study.

## 2. DATA MINING TECHNIQUES

Data mining [9] is the action of detecting deviations, correlation, and pattern within large data sets to reach out the final data which is required by Organizations or Individuals. With the help of data mining techniques we can reach out to the resulting data for increasing revenues, enhancing interest, reducing cost, improving learning strategy within the organization we can increase the stability of the users. We can also reduce the risk of wrong prediction of the data.

Different types of data mining techniques are there to reach to the conclusion we need to apply particular data mining techniques, if it will suits to our collected data and will give us productive result or the result which gives the clear picture towards data then we can apply that technique. With the help of this we can improve the imperfect data.

**2.1. Tracking patterns.** This one is very basic techniques in data mining to recognize patterns or sequence in your data sets. This happen at regular intervals. For example, to increase the sale of the items certain product will launch according to weather condition.

**2.2. Classification.** This technique is complex then other techniques because it force us to collect data according to given categories of attributes through which we will reach to further conclusion. Example: on the basis of previous sales of the shop we can classify the products and therefore we can fulfill the demand of the product.

**2.3. Association.** Association mining [5–7] techniques is associated with tracking patterns, one data is dependent upon the existence of another data. For example, we have noticed many times that when customers buy a specific item, they also want to buy a second, associate item.

**2.4. Outlier detection.** In most of the cases, we can't simply identified the data pattern and also it will not give the clear understanding of our data set. Then we also need to introduce outliers in our data. For example, if we know that maximum purchasing of one particular thing occurs in the summer weather but suddenly its purchase start in the winter weather then we need to introduce external outlier to understand the behavior of the data.

**2.5. Clustering.** Clustering [11] is very close to classification, but it will group up the data on their similarities. For example, we can make groups of likeness and dislike attributes of the members.

**2.6. Regression.** Regression, is based on planning and modeling, it is being used to identify the data which exist and matched with property of certain variable in the presence of other variables. For example, price of the items can be raised on the basis of factors like availability of the items, consumer demand, and competition.

**2.7. Prediction.** Prediction data mining technique is one of the most valuable data mining techniques, but after apply this technique we can see its result in future. In most of the mining cases, we just identifying and understanding historical trends of any product through which we can predict what will be demand of it in future.

As per different types of data mining techniques we can apply in our current data, then we can reach to our result. To see which one techniques will suitable for our given data we need to use different types of data mining tools according to their availability.

### 3. DATA MINING TOOLS

We need a latest machine learning [1] tool through which I can apply these data mining techniques on the given data.

I have used Weka tool to accomplished my task, due to freely availability of this tool I can easily check which data mining techniques help me to understand the reason that how we can enhance e-learning among learners those who are at different level of educational program.

I know that while learning online different kind of challenges occur. Even we provide them best e-learning platform, we need to check and remove the barrier between the learner and e-learning. Different types of challenges are discussed below.

#### 4. CHALLENGES OCCURS DURING ONLINE LEARNING

Online educational contents are available for all learners, to check the importance of those e-learning environment, we need to collect the data of learners who are already using online educational contents or those who are just beginners and also those who do not know how to use online learning environment. Therefore we need to consider all the challenges occurred during online learning. Challenges divided into five main sections; Demographics Variable, learner characteristics, Technology, Content and External support.

##### 4.1. Demographics Variables.

- (1) Learner's age, gender, location and educational level may affect the learner's learning on online educational environment.

##### 4.2. Learner characteristics.

- (1) If the user has the technology support, but sometimes he is not a techno savvy due to this reason he is not able to handle his query online rather than in the traditional classroom.
- (2) If the learner doesn't have positive attitude towards online learning then he will not access online learning. Therefore attitude towards online learning need to change so that they would become active learner to access online contents.

##### 4.3. Technology.

- (1) Technology is a big issue that arises many time while usability of online learning contents. Therefore we need to fix up this issue at both ends.

Like internet speed, software/hardware support if these facilities not available.

#### 4.4. Content.

- (1) Firstly, if the contents that would not be understood by the learners, again it comes out as a big challenge to us to check the positivity of online environment. Therefore contents should be user friendly.
- (2) Huge amount of contents are available online and i.e. also existed in different format, a learner's aim is not fulfilled when we can provide them different type of contents for the same topic. Sometime According to learner's requirement, format of the content is not available. Suppose a learner want to see an animated story so that he can easily u'stand the topic but at that moment he finds only the textual information.
- (3) Utilization of the online contents for their assigned work is another challenge, because most of the time a learner want to use easier content collection method to do his work. Therefore it might be big challenge that where we provide them easier method for accessing online content to accomplish their task.

#### 4.5. External Support.

- (1) On E-learning platform consisting support of instructor is missing so that learner will not build up interest for the online contents.
- (2) Peer group collaboration is missing in online learning environment, a leaner learning capability is better in a group than standalone learning.

### 5. METHODOLOGY

I have used here Quantitative methods through this method I conduct the survey using google form among learners and collect data of 620 participants [2,3].

Before conducting the survey, initially I have consider that all of the users belongs to India, and they are using online platform but some of them are beginners. I have used weka tool which is freeware to analyze data and to perform further action, I have concluded data mining [10] on collected data. Before the

research I have consider that Technology support, Technology savvy, Motivational support, Active learner, Suitable contents all these factors affecting online learning.



FIGURE 2

## 6. ATTRIBUTE ON WHICH LEARNER IS DISTRIBUTED

**6.1. Demographics Variables.** In demographics variable learner's (Age, Location and level of education) is considered.

**6.2. Learner's Skills.** Technical and activeness skills are two main sub factors in learner skills which are responsible for the enhancement in e-learning environment.

**6.3. Technology.** In technology, quality of technology and ease of technology these two main factors through which we can learner's learning may affected during online learning.

**6.4. Contents.** Quality of contents and Perceived ease of use are another two main sub category of the contents, learner's learning also depend upon on the educational contents what they will find during online learning.

**6.5. External Support.** Peer group and instructor support are two main sub factors through which learner learning will going to affect.

## 7. CLASSIFICATION RULE MINING RESULT

With the help of Classification rule mining, I have applied J48 decision tree algorithm due to which I have rectified that impact of all the factors are not same it is different for every learner but I need to judge the overall impact of the factors which are the least and most affective factors so that we can improve or focus on those factors which are most affected during online learning, according to the above result what I have concluded using WEKA tool, I reach to the point that External support and technical skills of the learner most affective factor during online learning and Technology is least effective factors that is influence e-learning. So that we need to enhance technical skills of the learner and to provide external support to the learner. Therefore to enhance e-learning the most impacting factors to be discussed and reduce the effectiveness of it during online learning. Through which it will impact to the online study and will be enhanced. As shown in figure 2 below to make e-learning contents effective we need to give external support to the learner while using e-learning environment, and user must excel in their learner characteristics(Active skills and Technical Skills), if this factors are effective only than we are able to enhance e-learning environment.

In result we can conclude the point that with at least minimum Technical support and External support to be provided to the learner at all level of education. This change will increase the online usage of contents.

## 8. CONCLUSION

We have checked through Classification rule mining that there is maximum impact of learner characteristics (Technical Skills) those who don't have Technical Skills and External support cannot access the online contents properly.



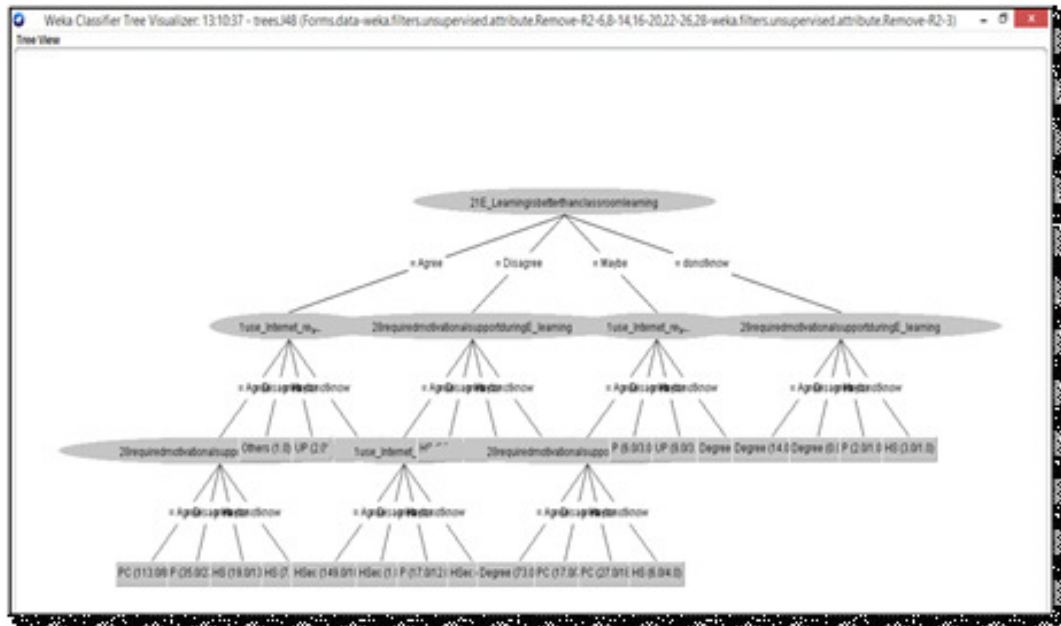


FIGURE 3

Because it was shown in J48 mapping there is no measure impact of technology which was proved via classification rule mining as shown in figure 3.

Therefor we need to provide technical skills and External Support only to the learner in first hand and it can be possible in today's life because mostly learner using mobile phone it means they have the technology feature in advance we just need to provide technical skills and external support so that they will enhance their e-learning.

Then we will have to check our own considered point that is it possible via providing minimum technical skills and External support to the learner, I have gone through data mining technique.

With the help of above figure, we can estimate through classification analysis and come to the point that without the External support and learners' technical skills learner are not able to access online contents as it is shown in fig. 3, but after giving them External support they can access the online contents more easily as it is shown in figure 3. All the learners who are not able to accessed the online contents it is found that through visualization through their clusters that they don't have technical skills and they want external support so that they can avail educational content online in ease manner.

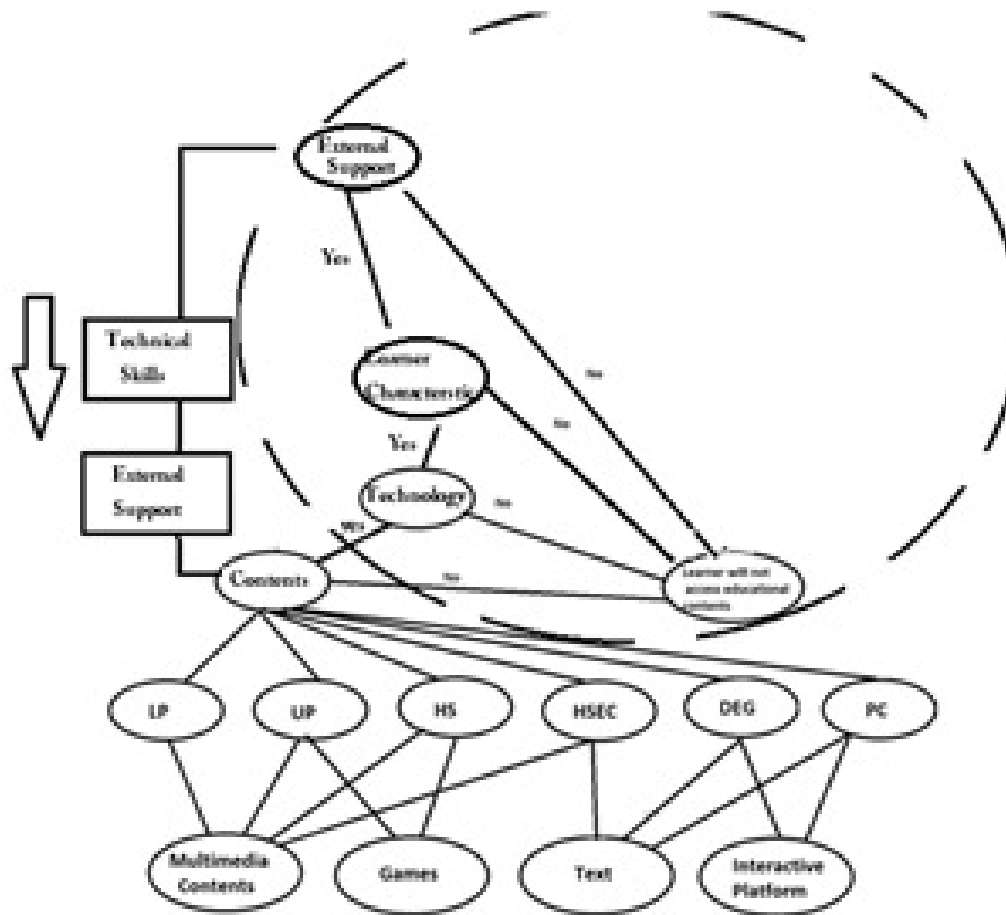


FIGURE 4

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