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IDENTIFYING AND RANKING THE ATTRIBUTES THAT AFFECTS EDUCATIONAL BACKGROUND OF STUDENTS WITH LEARNING DISABILITY USING WEKA TOOL

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Abstract: In modern era, data mining used to find the difficulty arises in the education field. Learning disability is a major problem in academic background that influences the improvement of students. The attributes that affect the performance predict the improvement of education of students with learning disability using mining tools. These attributes includes demographic, academic, financial, parental and social support. In this research work, study conducted on student with learning disability finding the factors influencing their educational outcomes among normal student. This paper predicts the learning disability of student performance using dataset reduction and attribute selection method in WEKA tool. The reduced dataset with fewer attributes provides the tool to improve the value of education. The experimental study shows the efficacy of dataset reduction algorithm with attribute selection leads to increase the performance of student with learning disability.

Keywords: Prediction, Dataset Reduction, Attribute Selection, WEKA, Learning disability, Educational background

I. INTRODUCTION

Data Mining used in different area for example medical data, educational data etc. Knowledge discovery in mining approach extract the information and relationships from huge amount of stored data. It is widely used in decision making to solve the problems more accurate in many fields such as educational, medical, business etc. There has been emergent interest in mining approach to discover the betterment of student with learning disability performance in educational field. The objective of mining technique in education used to improve educational behavior by predicting the performance of student with learning disability. It uses many techniques for the effective prediction of the student performance with learning disability based on the factor includes demographic, academic, financial, parental and social support.

To improve the efficacy of student with learning disability, attribute selection plays a key role. Attribute selection is one of the significant preprocessing techniques to improve the performance of mining process. It is the method of decreasing the inputs for analysis with the discovery of significant inputs. It is functional to inputs, prediction of attributes etc. It is a method of selecting the exact attributes from the collection of huge attributes by reducing the training time and simplifying the data. In this method, dataset reduction algorithm decreased the data. The reduced dataset used for attribute selection process for frequent attributes. It contains more number of attributes that are unrelated to the mining task. The filter method used to extract related attribute by reducing the attributes gives a suitable insight for the difficulty of prediction. Dataset reduction method used to decrease the data and remove irrelevant attributes by mining technique.

The use of dataset reduction method extracts the frequent variables. Frequent patterns arise often in data which includes

item sets, subsequences and substructures. From the frequent attributes, the rules are generated using association rule Mining approach. In mining technique, association rule are if then statement used to analyze and predict the behavior of learning disability. It helps to find out associations among different data using the metrics. The two parts of rule mining: an antecedent and a consequent. An antecedent originates in the data and a consequent originates in grouping with the antecedent. The total frequent item among left and right side is the support metric. The frequent item in right side that contain in left side is the confident metric. The minimum threshold value is set by the user for the metrics. The rules that are not meets the minimum requirement is discarded. It is used to find factors affecting the improvement of student with learning disability by associate the content to make recommendations. The student with learning disability performance predicts high accuracy for the betterment of educational achievements.

II. LITERATURE REVIEW

Suhas S. Athani et al. [1] improve the academic performance of student by implementing the algorithm Naïve Bayesian and predict the behavior of student using WEKA tool. Ritu Chaturvedi et al. [2] proposed the tutoring systems model to find out the success of the student using features. Radhika Menon et al. [3] present to overcome the barriers among girls and low literacy community in rural areas by altering the learning attitudes and methods of teaching. K. Chitra et al. [4] proposed to progress the learning ability of disabled students using the technology e-learning. The paper shows the significance of e-learning and students get rid from the influenced factors by understanding the learning environment. Prajakta S. Kasbe et al. [5] shows the study to find the accuracy of prediction. Tung-Kuang Wu et al. [6] identify and diagnose the learning disability by adopting the intelligence technique. Wei Zhang et al. [7] Show the behavior of student in the platform e-learning by predicting the performance. The paper applied the algorithm Logistic Regression and the result proves Eigen values effectively used for prediction.

Norfarhana Abdollah et al. [8] focused the study to achieve the learning environment of slow learners. The paper developed the tool that meet the requirement for the student by efficient task and easy learning method. Karthick babu et al. [9] suggests the approach of inclusive education for disability student learning environment includes methods of teaching and better environments with technologies. Gladiola andruseac et al. [10] suggests the platform e- learning to combine the educational with socio background. Basak Buluz et al. [11] present the experimental for the patterns that enlarge the importance of the learning model in predicting the educational achievement of the students. Aisha Alsobhi et al. [12] shows online learning improves the effectiveness and the need for assessment of the excellence of the learning experiences. Fatima Ezzahra Ben marrakchi et al. [13] focused the benefits of disability students with ICT usage. Aparna et al. [14] discussed the various types of extraction methods used for both online and offline mining technique. Irina Tal et al. [15] present a novel technology improved learning plan by providing stem education and progress for disabled students.

Xiang hong Tian et al. [16] addressed the rule mining model for the patterns by finding the difference in the educational position of male and female students. Nikolaos C. Zygouris et al. [17] provide a helpful technique for LD both in study and clinical settings. Anis Zarrad et al. [18] proposed the modern learning methods by creating the e-Learning environments that append values to the capacity of student and become accustomed to constraints. Vinumol et al. [19] presents an interactive prototype for supporting learning disability students. T-K Wu et al. [20] focused on the model neural network and evaluate the strategy of factor optimization process.

III. METHODOLOGY

A. Objective of the Study

In this research paper proposed to assess the students with learning disability among normal student for the betterment of their academic outcomes. From the Fig. 1, shows the framework for the dataset reduction and attribute selection to predict the performance of students with learning disability.

B. Dataset Reduction

First, the collected data is organized and save it in the ARFF format. The dataset is reduced using the dataset reduction algorithm by removing the irrelevant data. Using the algorithm, the dataset size is reduced by improving the memory with less time consuming.

Algorithm for dataset reduction

D: Dataset N: Sequence of elements A: Attribute Step 1: Data1=D Step 2: Sequence= N Step 3: i=1 Step 4: Repeat Step 5: For each $T_i \in D$ do Step 6: flag = 0 Step 7: for each a $\in A$ do Step 8: flag=flag v $T_i[a]$ Step 9: if (flag=0) Step 10: Data1=Data1 - T_i Step 11: Sequence = Sequence - 1 Step 12: Until i \ll N

C. Attribute Selection Method

The attribute selection method is applied to the dataset extracted by dataset reduction algorithm. Based on the consequences, the most influenced attribute is identified and predicts the important factors for the students with learning disability among normal students. The most frequent attribute influenced the performance of students with learning disability is identified.



Fig. 1 framework for predicting the performance of students with LD

From the Table I show the frequent attributes influenced the LD students among normal students.

Table I. Frequent attribute influenced the performance of students with learning disability

SNO	Attributes influenced LD Student among normal student		
1	Hyperactive		
2	Aggressive		
3	Personality Problems		
4	Spatial Relationships		
5	Oral Expressive Language		
6	Receptive Language		
7	Mathematical skills		
8	Sequencing		
9	Abstraction		

10	Memory
11	Social Skills
12	Scotopic Sensitivity
13	Sensory Integration Issues
14	Organization
15	Less Day dream

IV. RESULTS AND DISCUSSION

The data collected from school going student consists of 145 children in that 78 are boys and 67 are girls. The student attending normal school among the age group from 6 years to 15 years included in this study. Based on the study, almost 40% of students are suffering from learning disability. Student with learning disability exhibits important behavioral problems than normal student.

The dataset reduction algorithm and attribute selection method finds the most frequent attribute that influenced the learning disability student among normal student is identified. From the Table II, shows the frequent attributes influenced the performance with the ranking values.

Table II:	Ranking	the attributes	influenced	the student
		with LD		

	Students	Students	
	with Learning	Behavioral	Normal
	Disability	Problem	Student
Hyperactive	0.5	0.2	0.75
Aggressive	0.48	0.18	0.79
Personality			
Problems	0.52	0.21	0.72
Spatial			
Relationships	0.47	0.17	0.81
Oral Expressive			
Language	0.45	0.15	0.6
Receptive			
Language	0.46	0.12	0.58
Mathematical skills	0.65	0.23	0.88
Sequencing	0.48	0.19	0.67
Abstraction	0.47	0.15	0.62
Memory	0.66	0.25	0.91
Social Skills	0.57	0.26	0.83
Scotopic Sensitivity	0.51	0.24	0.75
Sensory			
Integration Issues	0.61	0.2	0.81
Organization	0.4	0.11	0.51
Less Day dream	0.58	0.19	0.77

From the Fig. 2, the experimental result shows the students with learning disability and behavioral problem is influenced with the attributes. Based on the attribute extraction, improves the academic performance of students with learning disability is predicted with ranking.



Fig. 2 Experimental result of attribute ranking

V. CONCLUSION

The dataset reduction algorithm reduces the size by removing the irrelevant data. Based on the reduced dataset, the most frequent attribute is identified for the students with learning disability and behavioral problem. For the prediction of students ranking to the variable is allocated. The experimental result shows the factors influenced the learning disability to predict the improvement of educational background for students with learning disability.

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