

# Smart Way to Inspect Student Performance using Emotional State on Learning Analytics



Vidhya.R, G.Vadivu

**Abstract:** *The paper describes the research of the students pursuing higher technical education calculating their skills, behavior, emotion, learning style and methods of the students using learning inspect in smart way. The learning inspect is the smart and innovative way of detecting the student aspects. In this we consider a group of students who taking the online test and record the students interaction with each part of the test by providing the option to each and every questions. The recorded data is stored in the data base. After the completion of the analytical test the outcome data of the individual student is calculated. The calculated data may provide the students learning ability and how they tackle the exam and how they prepare themselves in the exam. It also shows that the handling of pressure during the time of exam. The exception outcome is being correlated with the various parameters to detect the student survival and the performance in their academics. This method is being expected and made to turn all of their intention towards it.*

**Keywords:** *Logistic Regression, SVM, Data handling and Emotion calculation of student.*

## I. INTRODUCTION

Now a days the student who are pursuing the higher education can be suffer from mentally disturbed they does not have the ability to tackle the mental disturbance. And some of the students due to the exam pressure they would not react to others in all situations. To predict these learning analysis is used. The learning inspect is the method of predicting the students behavior, learning methods, emotion and judge the capability of the student before itself. The student can undergo an analytical test. The analytical may consist of various parts of parameter. The each parts of parameter can have sub portions. The each sub portions contains minimum five questions. The each question is provided five options. The options are strongly agree, moderately disagree, slightly agree, moderately agree and strongly disagree. The student wants to understand it and respond according to it. They want to mention a tick mark which option is for the question according to him. The answer are been monitored and it gets stored in the data base.

Before taking the analytical test the students need to mention the personal details which would be helpful to identify the particular student analytical. This scheme is more innovative compared to the other present system in the academics studies. The questions are not much as ordinary it is to check the personal aspects so the category of the Questions can be in a standard form, So that the system can be good and in innovative way.

The main aim of the system is to predict the learning aspects and the basic handing technique based upon the result we can able to predict the strength of the student in the part of the academics. The content of the system should be in right and in loyal way so that they can be reached and being promoted by everyone. There are nearly seven parts of section and the section can be subdivided into some categories. The sections are learning style, behavior, emotional, multiple intelligence, cognition ability, learning methods. These parts of section are helpful to predict the capability of the student. The outcomes are being stored as per once they interact with the questions. Among the all the answers they answered the sum of the valuable answer can be taken into consideration for the evaluations. The evaluated result may show the survivance of the student and the performance in their academics. The analytical may consist of various parts of parameter. The each parts of parameter can sub portions. The each sub portions contains minimum five questions. The student wants to understand it and respond according to it. They want to mention a tick mark which option is for the question according to him. The answer are been monitored and it gets stored in the data base. Before taking the analytical test the students want to mention the personal details which would helpful to identify the particular student analytical.

## II. BASIC OF LEARNING ANALYTICS

The learning capacity of the students who mainly pursing higher studies can be predicted by the learning inspects. The prediction can be done mainly in using four ways that are supervised, unsupervised, logistic regression and SVM. These are the major tools which plays a vital role in the learning inspects. They clearly show how the analytical system gets executed with the help of the algorithms in each and every part of the sections as of inspects as we will discuss.

### Supervised Learning

Supervised learning is the learning inspects technique which is fully based upon the machine learning concept. They can focus in the input which is provided to them and the outcomes of the system.

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The system can be fully trained using the comparison test in which that they mainly concentrate in the data which is stored in the database. The input which is got processed and being compared with the data which is stored in the database individually. The data can be processed as an separate part of the system it can Takes a minimum amount of time period. To solve the issues which is been raised at the time of learning technique several steps get followed. The major thing is to analyses the type of training structure is to be provided. Next step is to gather the training structure which is to make the right way of optimizing the input image. And the major thing is to calculate the provided input is matches the data in the training structure. In case of absence in the desired input the data storage path then it will not produce a required output. After the completion of the training to the machine the data is to be designed as of required form. The final stage of the output can be tested to the executable stage with the terms of the training practice of the machine.

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To solve the particular part of the issue the bias changeable trade mark is used. The variance which is referred to the changes. The term variance may plays a role in the properties of the input which gets allocated to that of the training set. The another issue is that of the amount data which is got passed to the training set is of not fake. To detect the issue the data functionality is used to prevent these form of issues in the variable level. The data process can be used to make a comparison in each stage before the data gets meet the data set of the training path. After the detection of the data is of true the condition is being passed to the data storage path and the normal activity of the training set continued.

### Unsupervised Learning

The unsupervised learning is the process of finding the formerly existing's patterns in the data set. It is also known independent-organization. The data which is not depend upon the others data in the training structure. The newly existing data not much equal as that of the data in the old set form. The unsupervised learning is the one of the part of the machine learning technology. The learning technology can be predicted with the help of the performance of the training set being executed. They can always deal with the collection data in the set. The data in the collection is of different

patterns. The patterns in the collection of data can posses various attributes. The attributes can be created by the way of processing the input data.

The data can be done by the probability distribution in which  $P(a|b)$  in which the b is provided as the input data based upon the probability convention. The input data which is got processed and is being compared with the data which is stored in the database individually. The data can be processed as a separate part of the system it can takes a minimum amount of time period. To solve the issue which is getting raised at the time of learning technique several steps get followed. The major thing is to analyses the type of training structure is to be provided. Next step is to gather the training structure which is to make the right way of optimizing the input image. And the major thing is to calculate the provided input is matches the data in the training structure. In case of absence in the desired input the data storage path then it will not produces a required output. After the completion of the training to the machine the data is to be got is designed as of required form. The particular part of the segmentation of the data patterns takes place in the collection of data.

The probability occurrence can be derived by the learning analytics such P means which is the major part is to solve the cluster issues in the data set patterns. The data which is not get depend upon the others the data in the training structure. The newly existing data not much equal as that of the data in the old set form. The unsupervised learning is the one of the part of the machine learning technology. The learning technology can be predicted with the help of the performance of the training set gets being executed. They can always deal with the collection data in the set. The data in the collection is of different patterns. The patterns in the collection of data can posses various attributes. The attributes can be created by the way of processing the input data. It is also the study of the open network model which it got much adaptive and it get widely used in the segmentation process. The process can be a model of the open network which it being used in the characterized of the training set. All among the open network the adaptive perspective model is used in the data segmentation and the processing of the data in various form of the data patterns.

### Algorithm

The learning analytic followed by the certain algorithms in the training set. The data based algorithm in the required part of the patterns in the collection of data.

```

Initialize a = h1, ..., li T
Normalize X
Repeat until convergence
a = a + alpha m XT (y + g(Xa))
a = ones (n, 1)
X = studentize(X) % normalize X
X = [ones (m, 1) X]
For t = 1:100 % repeat 100 times
    D = y - sigmoid(X*a)
    a = a + alpha / m *
X' * D
G = sigmoid(X*a)
    
```



$$J(t) = 1/m * (\log(G)^y + \log(1-G)^{(1+y)})$$

Output a

**Support Vector Machine**

The SVM is the superior of the learning analytical part which is used in the algorithm part of the learning mechanism. The machine can support the algorithm issues in the affordable part of the data set in the data base. The data can be contaminated in the data section of the vector machine. The data segmentation can be done in each and various part of the comparisons of the data analytic technique. The grouping of data can have independent properties where the conical appearance of the data does not occurs. The vector algorithm reduces the mismatches of the data in the training set. In the vector part the data can be viewed as the A point and we want to find the data point can be separated to that of the A-1 part. The separation of data in the vector dimensions can be done at the point of the data segments. The classification of the data in the part of the data input is done at the data comparison. They can be compared at the point of the data processing to the input of the training setup. The togetherness of the data in the cluster management can be differing from structure and that of the characteristics properties.

The vector characterization is done by rough margin and the smooth margin. The rough margin shows considering the two data set which is get separated by the certain limit and the separation distance is small when compared to that of the normal separation. The vector which is surrounded by a margin. The soft margin is that the data separation is done at minimal extend. The data can be separated at the path of the vector can be maintained. The machine can support the algorithm issues in the affordable part of the data set in the data base. The data can be contaminated in the data section of the vector machine. The data segmentation can be done in each and various part of the comparisons of the data analytic technique. The grouping of data can have independent properties the conical appearance of the data does not occurs. The vector algorithm reduces the mismatches of the data in the training set. They consider two planes that can be separated at the various distances from the point of the data set the point at which the data gets located is data location path. The path can be varied by the various set of parameter which is being done in the machine training path. The path can be changed that based upon the separation of the data. The distance form the data point to that of the plane is

$$\vec{w} \cdot \vec{x}_i - b \leq -1, \text{ if } y_i = -1.$$

**Logistics Regression**

The logistic regression is the probability of occurrence of the particular condition existing. The can determined the incoming and the outgoing of data to the training set. The calculation set of predominant of data in the section of the data base. The statistical of data analytical can be done in the form probability condition. The value can be of either 1 or 0. The value can be predicted either the data can propagates to the data set is consider as 1 otherwise it is consider as 0. The data accumulation can be minimized at the comparison stage of the data being present in the sets. It is the binary regression which can be varied to the greater

extent. The data extent can be varied to the number of data comparison patterns. The data can be constructed to the varied number of algorithms used in the statically process. This can be shown by the mathematical calculation

$$\ell = \log_b \frac{p}{1-p} = \beta_0 + \beta_1 x_1 + \beta_2 x_2$$

The l is the log and b is the base of the algorithm these parameter can be used in the calculation of the number of hours being consumed by the student to complete the given task in the period of limit. It can be used in the hour's calculation of the data being recorded in the data base. The data can be separated at the path of the vector can be maintained. The machine can support the algorithm issues in the affordable part of the data set in the data base.. The grouping of data can be having independent properties the conical appearance of the data does not occurs.

The vector algorithm reduces the mismatches of the data in the training set. The data segmentation can be done in each and various part of the comparisons of the data analytic technique. The grouping of data can be having independent properties the conical appearance of the data does not occurs. The separation of data and the plane will not happen inspite of the binary operation can take place to avoid such latency of the data that can be get it into the learning inspect of data base. It also used in the ratio test of comparing the two sets of data. The data being stored in the storage path and the data which is get transmitting to the training set. The data can be trained in two ways the .The ways can be derived as odd and the even way path. The point at which the data can be connected to that of the training set structure path of the learning aspects.

**III. PREPROCESSING**

The learning analysis of the data which can be provided by the Student that are stored in the data base. The learning test is to find the emotions, behavior and the learning capability of the student who pursuing higher studies. The learning inspects can consist of the various part of section. Each section may have the various questions which can deeply sense the students from the mentally level. The students who attend the different part of the section instantly data can be stored in the data path as much as they interact with the questions. The questions which can test the student mentality and capability in each and every part of the section. The section can be characterized by the dominant of student answering to that questions. After all the interaction of students with the sections the outcome is stored in the data base. For the analysis of the data in the storage path only the particular answer outcome is consider to evaluate the student capability. The preprocessing is considering the particular set of data among the overall data of the student in the data path.





| period1_score | period2_score | final_score | final_grade |
|---------------|---------------|-------------|-------------|
| 5             | 6             | 6           | poor        |
| 5             | 5             | 6           | poor        |
| 7             | 8             | 10          | fair        |
| 15            | 14            | 15          | good        |
| 6             | 10            | 10          | fair        |

Fig. 1 Preprocessing of Data

#### IV. REVIEW OF LITERATURE

1. The research and improvement of Learning Analytics involves doing the development, the use and integration of new processes and tools to improve the performance of teaching and learning of individual students and of teachers. Learning Analytics focuses specifically on the process of learning. Due to its connections with digital teaching and learning, Learning Analytics is an interdisciplinary research field with connections to the field of teaching and learning research, computer science and statistics. The available data is collected, analyzed and the gained insights are used to understand the behavior of the students to provide them additional support.
2. Higher Education looks forward to a future of uncertainty and change. In addition to the national and global as well as political and social changes, the competition on university level increases. Higher Education institutes share the same challenges as businesses - the need to increase financial and operational efficiency, expand local and global impact, establish new funding models during a changing economic climate and respond to the demands for greater accountability to ensure organizational success at all levels [1]. Higher Education must overcome these external loads in an efficient and dynamic manner, but also understand the needs of the student body, whom represents contributor as well as donor of this system.
3. In more universities use methods of Learning Analytics in order to obtain findings the academic progress of students, predict future behaviors and recognize potential problems in an early stage. Further, Learning Analytics in the context of Higher Education is an appropriate tool for reflecting the learning behavior of students and provide suitable assistance from teachers or tutors. This individual or group support offers new ways of teaching and provides a way to reflect on the learning behavior of the student. Another motivation behind the use of Learning Analytics in universities is to improve the inter-institutional cooperation, and the development of an agenda for the large community of students and teachers.
4. The predictors of students' success varied greatly among studies; some studies found that hits or clicking patterns are the main predictors of success. Others have emphasized the role of forum postings and social network analysis. In one study, formative assessment seemed to be the most important predictor, and in another, indicators of student motivation were reported to play a role. The variation in predictor's importance among courses was also obvious in studies investigating more than one course at the same time;

these studies found predictors for each course are much more accurate than using generalized predictors for all courses. This variability in predictor performance is not a sign of inconsistency; it is rather a sign of the importance of considering teaching methods, instructional design and the way each LMS feature is used. It also underscores the need to tailor methodologies to specific contexts.

5. Predicting students' performance or students who are at-risk of underachieving or failing a course is the most common objective of studies exploring the potential of LA. Examples of this include, Macfadyen *et al.*, were able to identify to at-risk students 70.3% with accuracy using only LMS data; Open University GUHA predicted failure with 88% confidence using both LMS and demographics Results from OU analyze (included LMS, demographics, and financials) indicated that identifying at-risk students were possible with an accuracy of 50% at the beginning of the semester; accuracy increased to over 90% by the end of a semester.
6. The learning analytic can improve learning practice by transforming the ways we support learning processes. This study is based on the analysis of 252 papers on learning analytics in higher education published between 2012 and 2018. The main research question is: What is the current scientific knowledge about the application of learning analytics in higher education. The focus is on research approaches, methods and the evidence for learning analytics. The evidence was examined in relation to four earlier validated propositions: whether learning analytics i) improve learning outcomes, ii) support learning and teaching, iii) deployed widely, and iv) used ethically. The results demonstrate that overall there is little evidence that shows improvements in students' learning outcomes (9%) as well as learning support and teaching (35%). Similarly, little evidence was found for the third (6%) and the fourth (18%) position.
7. Despite the fact that the identified potential for improving learner practice is high, we cannot currently see much transfer of the suggested potential into higher educational practice over the years. However, the analysis of the existing evidence for learning analytics indicates that there is a shift towards a deeper understanding of students' learning experiences for the last years.

#### V. PROPOSED FRAME WORK

The learning analysis can predict the emotional, learning skills, intelligence at the initial stage of the student. This can be mainly performed in the students pursuing higher education because the student in the stage they can facing the lots of mental stress in the studies. The learning inspect shows how the student react towards other, they shows the how much they can able to tackle the exam stress. The learning inspect is one of the best method of predicting the mentally part of the student. The analytic test consist of various part each part there is subdivision is provided under this the some of the questions are constructed which can test the skills and emotions. The interact answers are been stored in the database.



They can show that how they can get interact with them. The outcomes are allocated in the data path. The certain questions in the data path can be much enough to predict the capability of the student. By getting the outcome of the individual student from the data pack we can provide some counseling to the student based upon the mental capability and to motivate them in improving skills in the studies.

## VI. CROSS TABULATION ANALYSIS

The cross tabulation can compare, segment the two algorithms. The SVM and the logistics regression can get cross evaluated and report which has the high performance and provide less drawbacks. The logistics regression algorithm can perform both the comparison and the classification. When a data is provided they can analyze and can classify the data according to the expectation of the outcome. The data can be performed as the data function that can be assigned in the regulation path. When the data which is been unlabeled and not able to find the data from the database it can be grouped in the form of cluster. The data is analyzed in multiple dimensions at each part of the data point. The data gets reflected at the data terminals of the data point. It can be performed in the plane segmentation. The data separation can be performed in this logistics algorithm. Where as in the SVM they can compare the data which is sent to training set. The data got from the set is compared with the data in the data base. They can perform the probability operation whether the given data is present in the data base or not. They can perform only the particular sets of operation rather than other significance operations. The data loss can be occurs in the vector machine algorithm. By comparing the both the SVM and the logistics regression the logistics can be better than that of the SVM. The data process can be archived properly and the data loss is not possible. The data separation can be made and then grouped into cluster according to the data address. The logistics algorithm will overcome all the drawbacks put forward by the vector machine.

## VII. RESULT

The logistic regression algorithm can perform both the comparison and the classification. The data is analyzed in multiple dimensions at each part of the data point. The data gets reflected at the data terminals of the data point. The data separation can be performed in this logistics algorithm. By comparing the both the SVM and the logistic regression the logistics can be better than that of the SVM. The data process can be archived properly and the data loss is not possible. In practical the logistic regression gives a maximum value compared to the SVM. This logistics algorithm formulates the accuracy of the data.

## VIII. CONCLUSION AND FUTURE WORK

In this paper we have demonstrated about the learning aspects of the higher technical students. The learning analysis technique is formulated to predict the students' performance in studies. We can sense the mental parameters which they can face in studies. The analysis has done in some different parts such as emotions, learning, and

intelligence. We can predict the capability of the students in the studies and also their emotional reactions. The students interact with questions during the analysis and their outcomes of the analysis are grouped in the data set. From the data they answered which make a sense to evaluate the performance of the students. In future work we describe all other features to get accurate result of a student.

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