Analysis of the Social Media Role in Smart Learning

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Abstract: *The paper describes and evaluates the role of social media in Smart Learning. "Smart learning is a broad term for education in today's digital age. It reflects how advanced technologies are enabling learners to digest knowledge and skills more effectively" [9]. The data in this module were collected from students in the survey is mainly held in student's perspective, what they prefer to study now this day, is it really useful as study material for effective and latest knowledge, all these basic questions are asked for the student and collect the facts of social media or other commercial online platform of learning sites. Data was saved in a database and algorithm was applied to it. The algorithm we used in this model was the decision tree algorithm. The algorithm was applied to a database based on the data decision tree was constructed and showed the results considering various possibilities.*

Key Words: Smart Learning; Decision Tree; Data Mining; R Data Miner;

I. INTRODUCTION

Smart learning is a broad term for education in today's digital age. It reflects how advanced technologies are enabling learners to digest knowledge and skills more effectively" [9]. The current scenario of smart learning is to use of Social media has been increased in India, now the question comes if social media can be used for learning. Many schools and colleges are taking advantage of social media. Social media platforms are being widely used by students. In the survey, we conducted 84% of the people said that they found social media was useful for the academic purpose. Also, 56% of people said that social media make learning more interesting. Adapting social media in smart learning will benefit students as well as teachers. Smart technology allows to replace a real presence in the virtual one, Smart Learning suggests the following:

- ✓ The flexibility of learning in an interactive educational environment;
- ✓ Free access to content around the world;
- ✓ Personalization and adaptation of training.

At present the concept of modern learning is learning everywhere it is convenient with the help of smart devices, providing easy access to learning and training information, the autonomy of student via mobile devices for getting the educational information.

II. LITERATURE SURVEY OF RELATED WORK

"Improving the Teaching Quality with a Smart-Education System [1]" this paper described Transformation of the information society to smart society, the higher education system in the smart education system and traditional universities into smart universities. "Implementation of smart-learning education system using robotic pet [6]" this paper described an educational entertainment game is a method or program Designed as an educational program with entertainment factors which allows students to learn as they are Playing a game. "Smart Learning for the Next Generation Education, Environment [8] "this paper described: This paper introduces a new radical construct, termed as sour purposely organized peer-to-peer learning, and its impacts towards both the formal and informal learning environment. "Smart education: Introducing active learning engineering classrooms in the Middle East [3]", this paper described: -This paper presents a case study of an engineering school in the Middle East that introduced a technology-enhanced active learning classroom. The students and teachers' responses to the latest smart learning environment were predominantly positive with some key areas highlighted for optimizing its effectiveness.

III. SYSTEM ARCHITECTURE AND WORKFLOW

Created a form to conduct a survey and share among college students and collect their response in the form of data. The objective of collecting this data is to identify which type of role does social media plays in student study side role or leading role. From student, got facts and figures and the positive response that now these days social media plays a very crucial role in learning that everyone has smart devices and they all access the social media and learning is much better and easier from the traditional system. Our main source of data is students, the survey is mainly held on student's perspective, what they prefer to study now this day, is it really useful as study material for effective and latest knowledge, all these basic questions are asked for the student and collect the facts of social media or other commercial online platform of learning sites. The data preparation process consumes about 90% time of the project.

The data from sources should be transformed, data transformation operations change the data to make it useful in data mining, and the following transformation can be applied:

- Smoothing: It is used to remove noise data from the table.
- Aggregation: Summery or aggregation operations are applied on the data i.e. The weekly sales data is being aggregated to calculate the monthly and yearly total.
- Generalization: In this, Low-level data are replaced by higher-level concepts with the help of concept hierarchies.
- Normalization: Normalization performed when the attribute data are scaled up or scaled down.

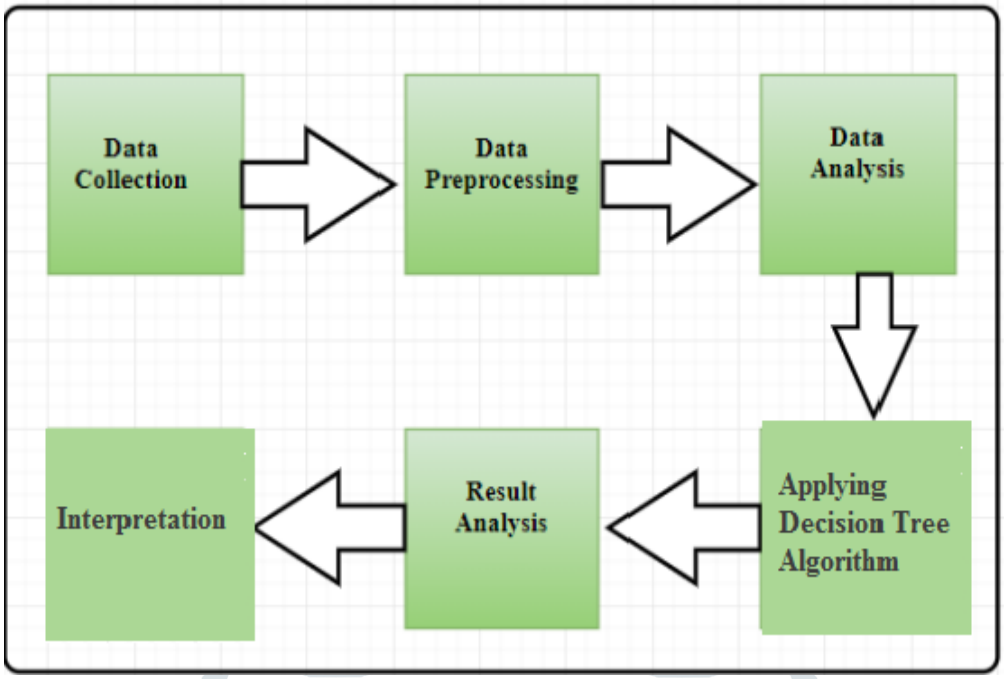

Figure 1: Data Workflow

- Attribute construction: These attributes are built and included in the set of attributes useful to data mining.

- Decision tree: A decision tree is a diagrammatic representation for classifying instance. A decision tree is a tree in which each internal (non-leaf) node is tagged with an input attribute. The arcs incoming from a node tagged with a feature are labeled with each of the possible values of the characteristic. For classifying an object, the appropriate attribute value is used at each of the nodes, starting from the root, to determine the branch taken. The path found by tests at each node leads to a leaf node which is the class the tree believes the object belongs to the basic algorithm. The decision tree is an attractive method since the results are easy to understand. Consider that each object has a number of independent attributes and a dependent attribute. The idea is to build a decision tree consisting of a root node, a number of internal nodes, and a number of leaf nodes. Building the tree starts with the root node and then splitting the data into two or more child nodes and splitting them in lower level nodes and so on until the process is complete.

IV. DATA ANALYSIS

The application of decision tree based result analysis has many benefits for teachers as well as to students. Teachers have easy access to the overall performance of all the students in the class, along with the reasoning for their good/bad results, This technique provides abundant information to teachers for targeting the areas of improvements of the students which might be lacking. To assist the students to work out these areas, teachers can make use of this technique to take decision for conducting training activities dedicated to those students who have performed poorly in their curriculum. By this application, students can understand that the teacher's contribution is important to them in the education system. Students can understand that their contribution should be on a regular basis to excel in their academics.

Data Table: A part of Business Intelligence is Data analysis and data mining, which is also a component of Data warehousing, database management, and Online Analytical Processing.
Data Mining: This term is most widely used in the late '90s when a business combines all of its data into a data warehouse. All of that data were conducted together to discover previously unknown trends, anomalies, and correlation.
Data Analysis: Data analysis is related to a variety of different tools and methods that have been developed to query existing data, discover exceptions, and verify hypotheses. The analysis is really a heuristic activity, where scanning through all the data the analyst gains some deep learning of the data. Analysis of data includes simple query and reporting functions, statistical analysis, more complex multi-dimensional analysis, and data mining. Online Analytical Processing is most often associated with multidimensional analysis, which requires powerful data manipulation and computational capabilities. Data Analysis is also included following steps:

Query and Reports: A query is simply a question or requesting some information put into a database management system, which then generates a subset of data after the query is processed. The demonstration of the data brought back by the query is the task of the report. The demonstration may hold within tabular or spreadsheet-formatted information, graphics, cross tabulations, or any combination of these forms.
Managed Query Information: The term managed query environment has been legally tale by the industry to give details of a query and reporting package that allows IT control over users' access to data and application facilities in a manner conforming with each user's level of expertise and business needs. A managed report environment (MRE) is a type of managed query environment.
Online analytical processing (OLAP): - The most well-known technology in data analysis is OLAP. OLAP servers, arrange systematically data into multidimensional hierarchies, called cubes, for high-speed data analysis. Data mining algorithms scan databases to discover relationships or patterns. OLAP and data mining are emphasizing the property of data, with OLAP providing top-down data analysis and data mining offering bottom-up discovery. The OLAP tools allow users to drill down through multiple

dimensions to isolate specific data items. The table content facts and figure of students in that students give their response to social media and other learning platform.

TABLE I. Survey Data

1	2	3	4	5	6	7
YES	Instagram	Codecademy, Unacademy	PC/Laptops	Agree	Strongly Agree	Useful
YES	Telegram	Udemy	PC/Laptops	Agree	Agree	Useful
YES	Instagram	Codecademy	PC/Laptops	Agree	Strongly Agree	Extremely Useful
YES	Whatsapp, Other	Unacademy	PC/Laptops	Agree	Strongly Agree	Useful
YES	Whatsapp, Instagram, Other	Udemy, Codecademy	Interactive TV	Agree	Agree	Useful
YES	Whatsapp, Instagram, Other	Other	Mobile/Tablets	Agree	Strongly Agree	Useful
YES	Whatsapp	Udemy, Other	PC/Laptops	Agree	Strongly Agree	Useful
YES	Whatsapp, Other	Other	Mobile/Tablets	Agree	Agree	Useful
YES	Whatsapp	Udemy, Unacademy, Other	PC/Laptops	Agree	Agree	Extremely Useful

In above table column Headers represented as follows:

1. Is Social media useful?
2. Media Students prefer
3. Which other online learning website?
4. Equipment you prefer for E-learning?
5. Smart devices help to understand the topics better.
6. Online system makes learning interesting?
7. Online study materials are useful?

Statistical Data analysis

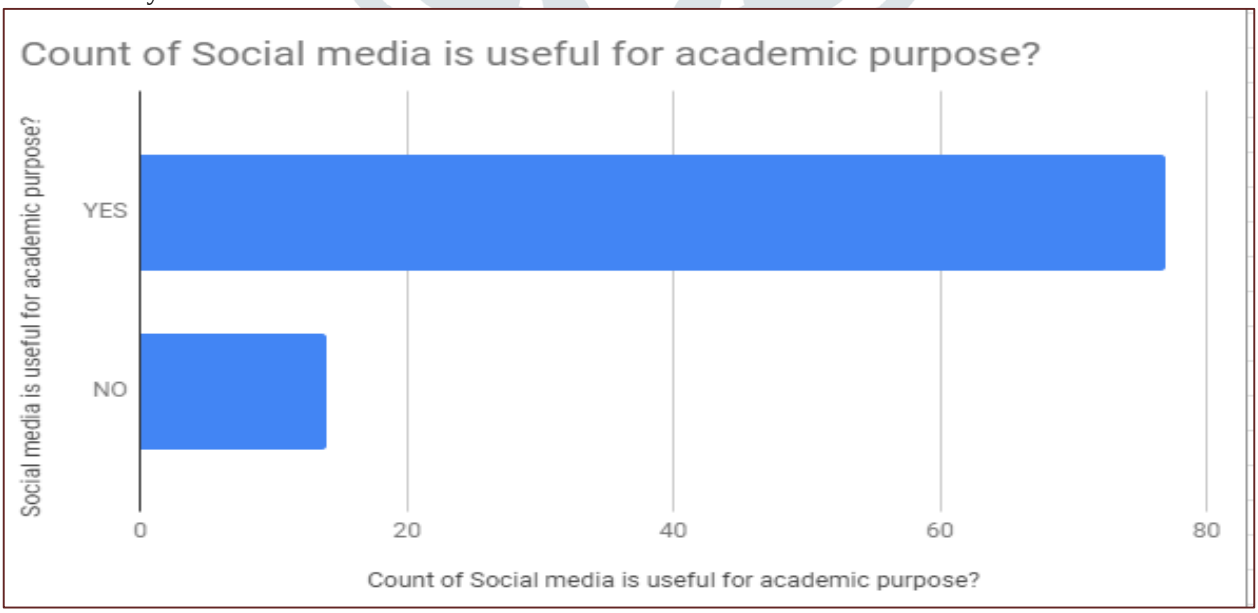

Figure 2: Count of social media is useful for academic purpose

The data collected from students' results in maximum use of social media for the academic purpose which indicates the huge influence of social media in smart learning.

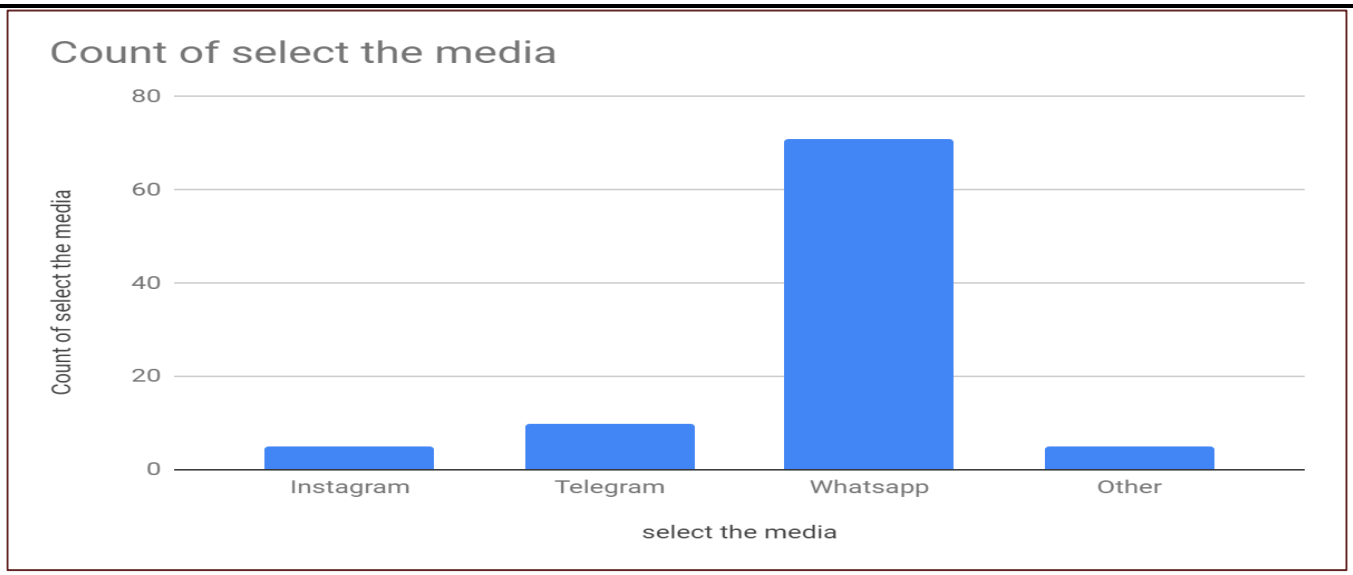

Figure 3: Media preferred for online learning

Many social media platforms are being used, out of all social media platforms like a telegram, WhatsApp, Twitter, Instagram, WhatsApp is most used among the students.

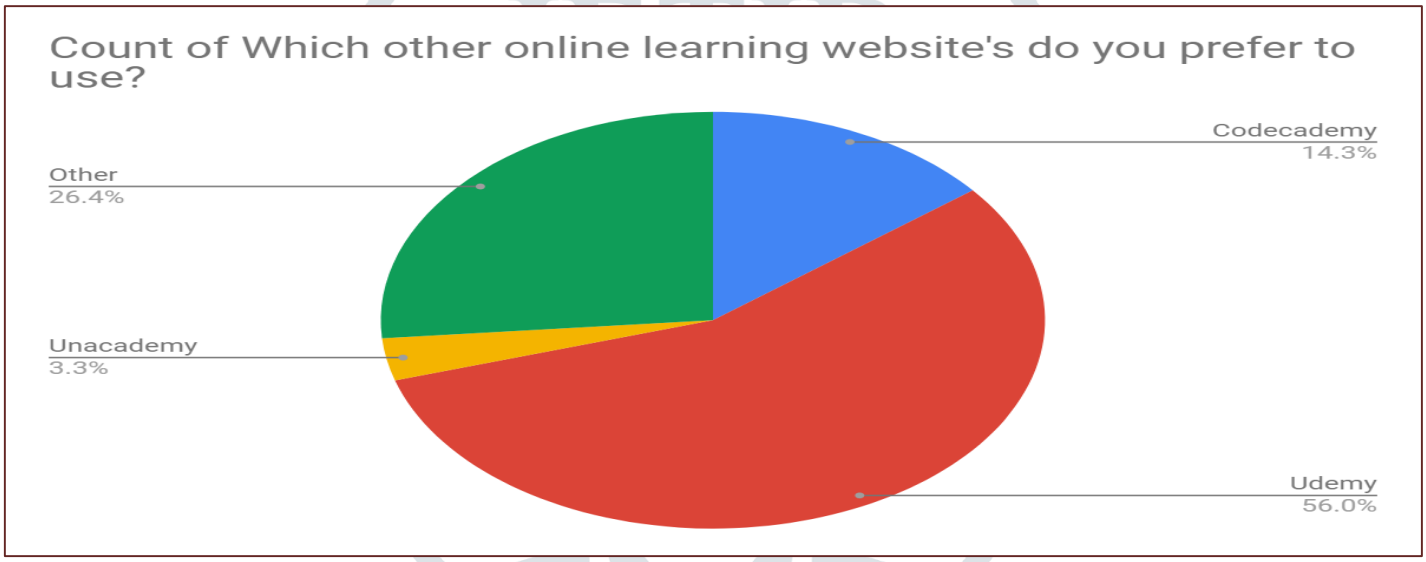

Figure 4: Online learning websites

It indicates social media platforms being an important resource for smart learning. Between online learning websites like codecademy, udemy, data camp is used, where udemy, codecademy along with other websites are used as a medium of learning.

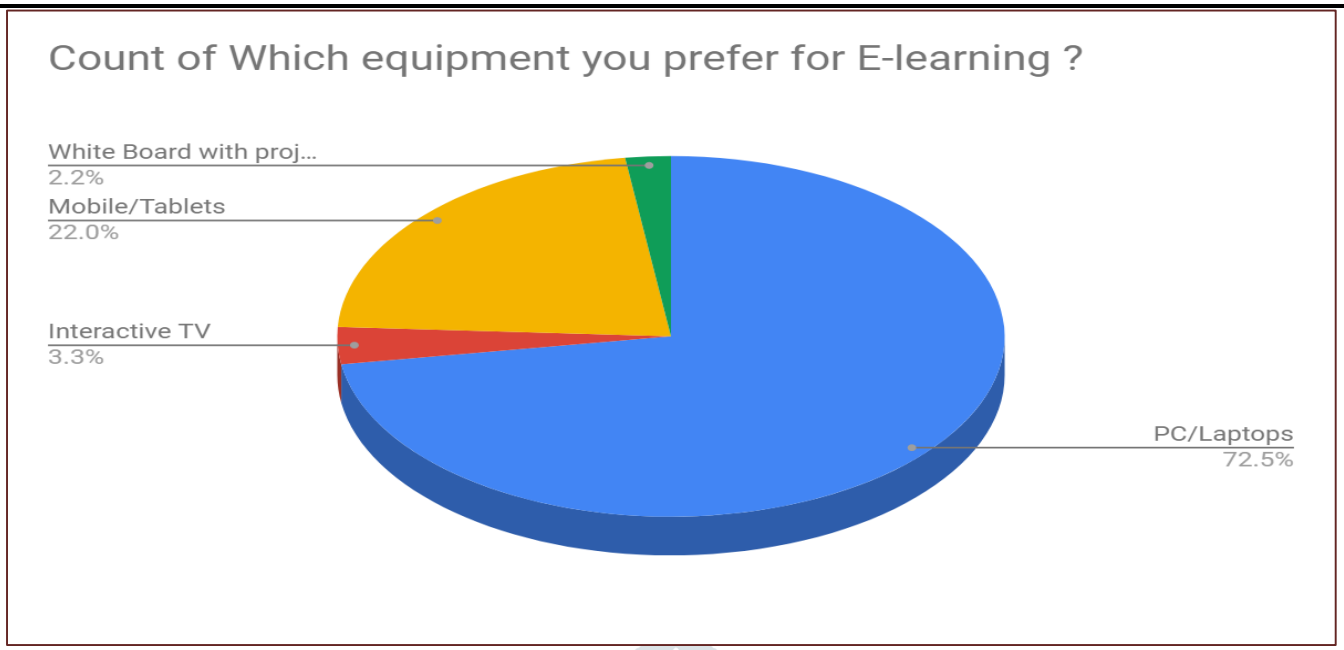

Figure 5: Equipment preferred for E-learning

In smart learning, online websites also contribute a significant role by being available to students 24/7. PC/laptops, mobile, tablets were the most used types of equipment preferred for e-learning along with a whiteboard and interactive TV. The more handy types of equipment, which are easier to use are mostly used by students.

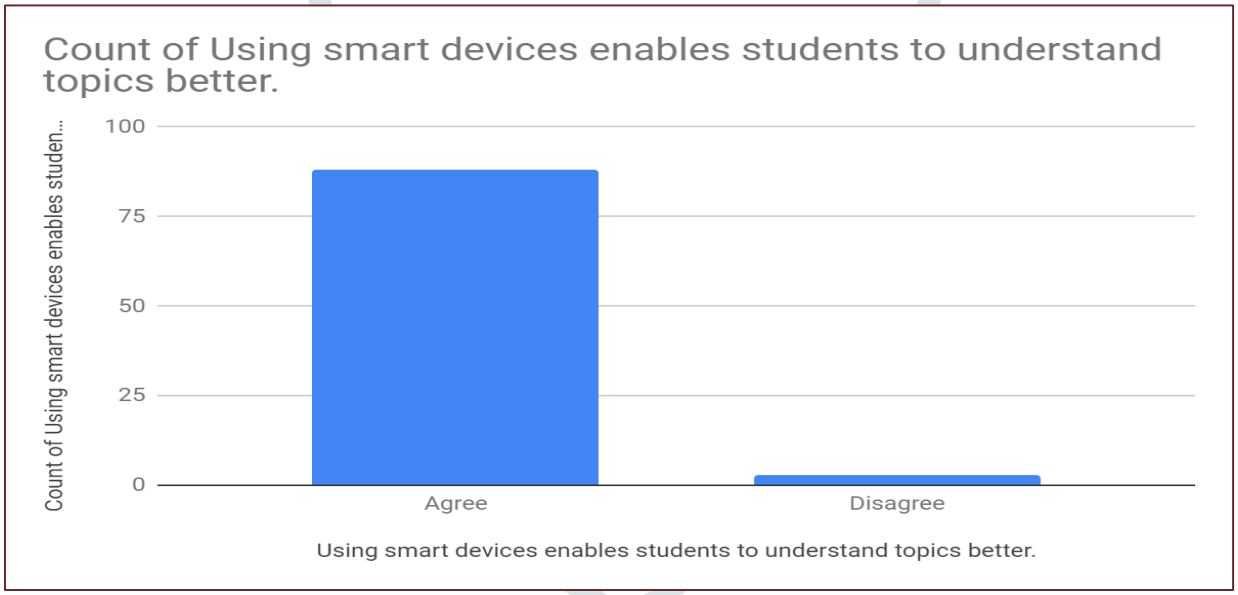

Figure 6: Does using smart devices makes student understand the topics better?

Maximum students agreed that smart devices enable students to understand the topics better. Also, Majority students responded as "agree" to "online system makes learning more interesting", which indicates the content likes images, audios, videos, and presentation of online learning keeps the student engaging.

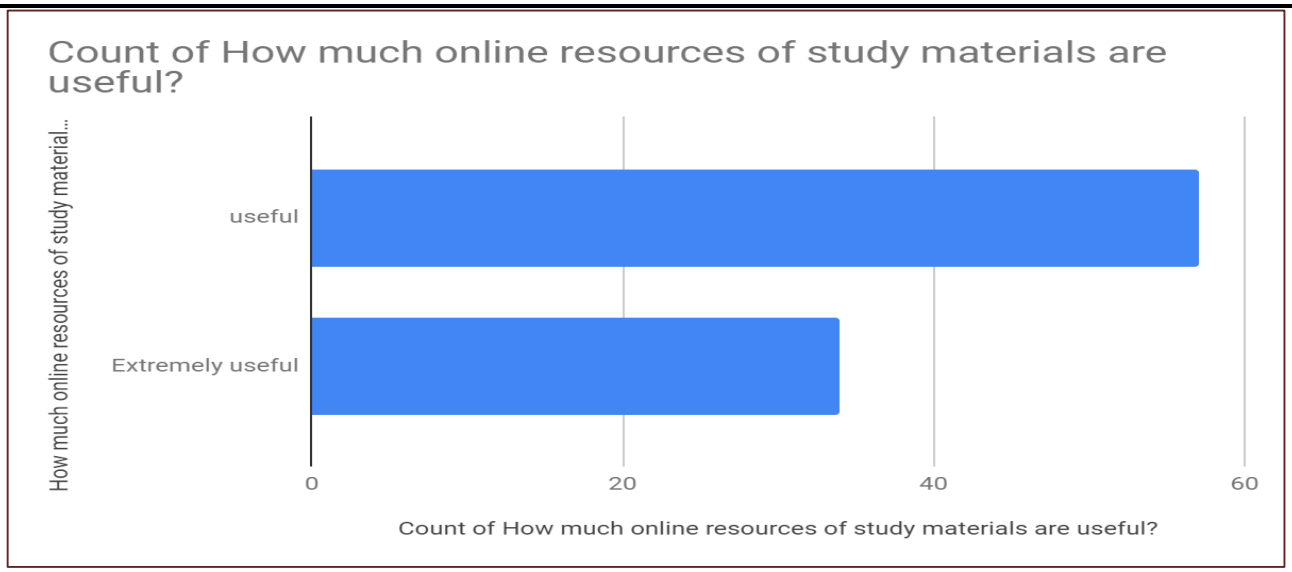

Figure 7: How much online study resources are useful

Finally, the majority of students find useful the use of the online resources of study material, which states that ease of access, availability makes it more useful.

V. RESULTS ANALYSIS

Decision Tree

We created the Decision tree using "rattle" tool using the following steps-

Step 1- Open Rstudio.

Step 2 - In the console type

>Library ("rattle")

. >Rattle ()

Step 3 - In rattle added the .csv data file, and press execute button.

Step 4 - As shown in below figure, select variable 9 as target and other variables as inputs.

No.	Variable	Data Type	Input	Target	Risk	Ident	Ignore	Weight	Comment
1	Social.media.is.useful.for.academic.purpose	Constant	○	●	●	●	●	●	Unique: 1
2	Whatapp	Categoric	◉	○	○	○	○	○	Unique: 2
3	Inatgram	Categoric	◉	○	○	○	○	○	Unique: 2
4	Twitter.or.telegram	Categoric	◉	○	○	○	○	○	Unique: 2
5	Which.other.online.learning.websites.do.you.prefer.to.use	Categoric	◉	○	○	○	○	○	Unique: 4
6	Which.equipment.you.prefer.for.E.learning	Categoric	◉	○	○	○	○	○	Unique: 5
7	Using.smart.devices.enables.students.to.understand.topics.better	Categoric	◉	○	○	○	○	○	Unique: 2
8	The.online.system.makes.learning.more.interesting	Categoric	◉	○	○	○	○	○	Unique: 2
9	How.much.online.resources.of.study.materials.are.useful	Categoric	○	◉	○	○	○	○	Unique: 2

Figure 8: Inputs and target

Step 5 - Switch to Model tab and set Min split = 10, Min depth =5, Min Bucket=5 and click on Draw.

Step 6 - The decision tree will be drawn as below

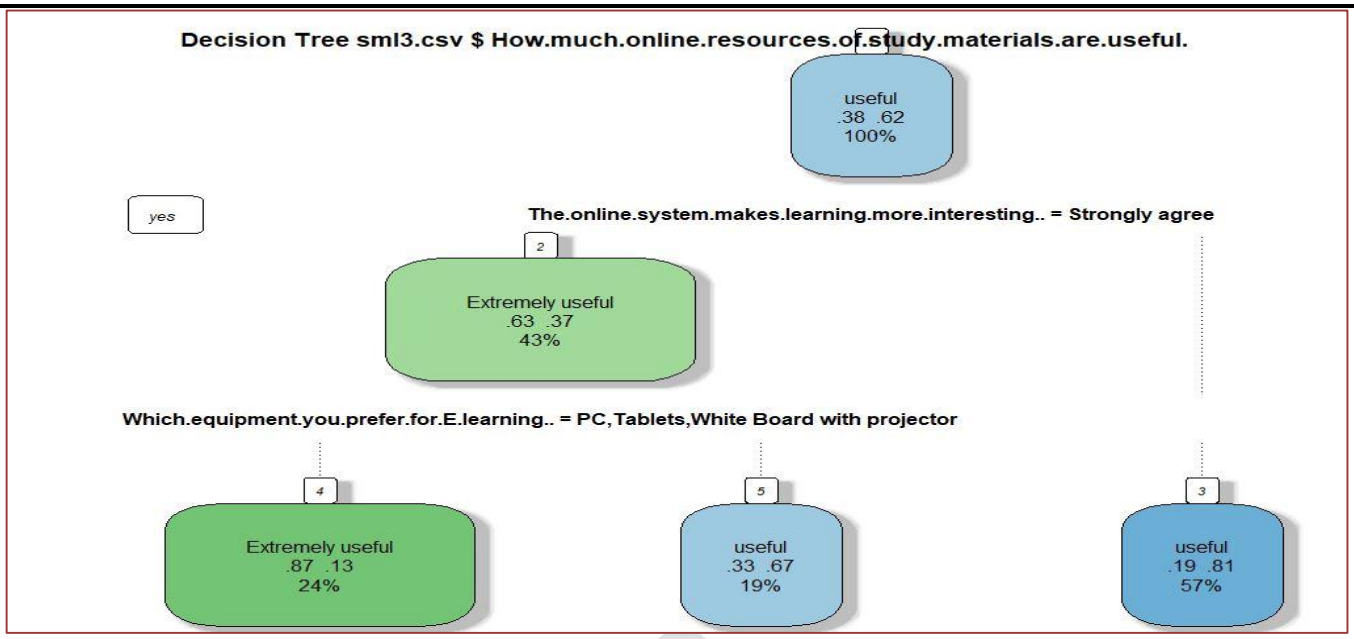

Figure 9: decision tree using rattle

We also used another tool called 'WEKA' and draw decision trees using the same data.

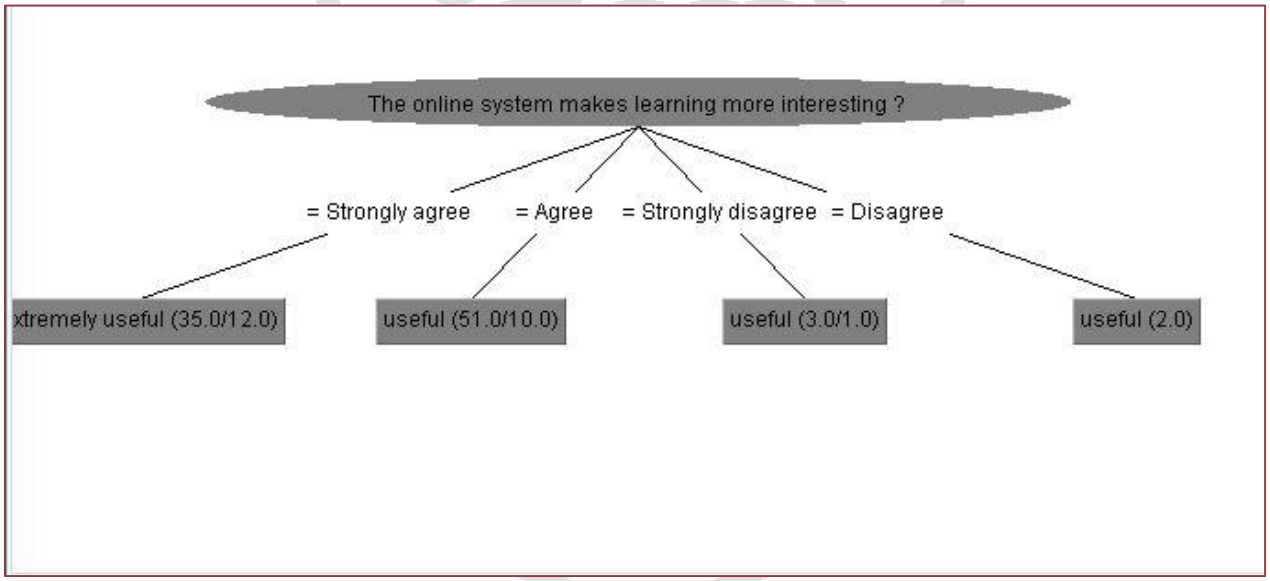

Figure 10: decision tree using WEKA

The database is created for smart learning for students and result is analyzed based on the data collected from students, and output is generated from various important factors that signify the role of social media in academic learning. The sample data related to considered attributes from various factors like:

- Usefulness of social media
- Social media platforms
- Online learning websites
- Equipment used for learning
- Use of Smart devices
- Online study resources

Based on the data decision tree had been constructed and shows the results considering various possibilities.

VI. CONCLUSION

The role of social media and online learning platforms in smart learning is implemented successfully. The data used in this paper were collected from students. Various attributes were considered, which helped to understand the role of social media platforms and websites which made smart learning easier to learn and understand. Using Decision Tree algorithm, we concluded that using social media on smart devices enabled students to understand the topic better.

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