

I. INTRODUCTION TO DATA ANALYTICS:

1.1 Introduction to Data Analysis/analytics:

Data analysis, also known as data analytics, is the process of examining and interpreting data to extract meaningful insights, patterns, and trends. It involves transforming raw data into valuable information that can be used to support decision-making, solve problems, and improve business or organizational performance. Here is a brief introduction to some key concepts and steps involved in data analysis:

Data Collection: The first step in data analysis is gathering relevant data from various sources, such as databases, spreadsheets, surveys, or online platforms. The data can be structured (organized in a specific format) or unstructured (text, images, videos) and may come from internal or external sources.

Data Cleaning and Preprocessing: Raw data often contains errors, inconsistencies, missing values, or outliers that can impact the analysis. Data cleaning involves removing or correcting these issues to ensure data quality and reliability. Preprocessing tasks may also include data integration, transformation, and feature engineering to make the data suitable for analysis.

Exploratory Data Analysis (EDA): In this phase, analysts explore and summarize the data to gain initial insights. They use various statistical techniques and visualization tools to identify patterns, relationships, and anomalies within the dataset. EDA helps analysts understand the data's structure and characteristics before applying more advanced analysis techniques.

Statistical Analysis: Statistical methods are employed to quantify the relationships and patterns observed in the data. This involves applying descriptive statistics to summarize the data's main features, such as measures of central tendency, dispersion, and correlation. Additionally, inferential statistics are used to make predictions or draw conclusions about a population based on sample data.

Data Modeling and Analysis: Data modeling involves constructing mathematical or statistical models that represent the relationships and dependencies within the dataset. Analysts apply various techniques such as regression analysis, time series analysis, clustering, classification, or machine learning algorithms to uncover insights and make predictions. These models help answer specific questions and address business objectives.

Data Visualization and Communication: Visualizing data through charts, graphs, or interactive dashboards helps present the findings in a concise and understandable manner.

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1.2 Data Analytics Approaches:

Data analytics approaches can be broadly classified into three main categories: descriptive analytics, predictive analytics, and prescriptive analytics. Each approach serves a different purpose and provides distinct insights. Here's a brief overview of each approach:

Descriptive Analytics: Descriptive analytics focuses on understanding and summarizing historical data to gain insights into what has happened in the past. It involves techniques such as data aggregation, data visualization, and basic statistical analysis. Descriptive analytics aims to answer questions like "What happened?" and "What are the key trends and patterns in the data?" It provides a foundation for further analysis and helps in understanding the current state of affairs.

Predictive Analytics: Predictive analytics focuses on using historical data and statistical modeling techniques to make predictions about future outcomes. It aims to answer questions like "What is likely to happen?" and "What are the future trends?" Predictive analytics involves analyzing patterns and relationships in historical data to build models that can forecast future events or

behaviors. It relies on techniques such as regression analysis, time series analysis, and machine learning algorithms.

Prescriptive Analytics: Prescriptive analytics goes beyond descriptive and predictive analytics by providing recommendations and suggestions on what actions to take. It leverages historical data, predictive models, optimization algorithms, and decision science to identify the best course of action to achieve desired outcomes. Prescriptive analytics aims to answer questions like "What should we do?" and "How can we optimize our decision-making?"

Exploratory Data Analysis (EDA): EDA is an approach focused on exploring and analyzing data sets to discover patterns, relationships, and insights. It involves techniques such as data visualization, data profiling, and statistical analysis to gain a deeper understanding of the data and generate hypotheses.

Cognitive analytics: It is an advanced approach to data analysis that combines artificial intelligence (AI) techniques with human-like cognitive capabilities to extract insights from complex and unstructured data. It goes beyond traditional data analytics approaches by incorporating natural language processing, machine learning, pattern recognition, and contextual understanding to mimic human thought processes

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1.3 Steps of Data Analytics:

The steps of data analytics typically involve a systematic process that encompasses various stages. Here are the key steps involved in data analytics:

Define the Problem: Clearly articulate the problem or question you want to address through data analytics. Understand the objectives, scope, and desired outcomes of the analysis. Formulate specific and measurable goals to guide your analysis.

Example: Analyze customer churn in a telecommunications company and identify factors influencing churn rates.

Data Collection: Identify and gather relevant data from various sources. This may include internal databases, external datasets, surveys, APIs, or other data collection methods. Ensure that the data collected aligns with the problem statement and objectives.

Example: Gather customer data, including demographics, usage patterns, service history, and churn status.

Data Cleaning and Preprocessing: Clean the collected data to ensure its quality and usability. This involves tasks such as handling missing values, removing duplicates, addressing outliers, standardizing formats, and transforming variables as needed

Example: Handle missing values, remove duplicates, and transform variables if necessary.

Exploratory Data Analysis (EDA): Perform exploratory data analysis to understand the characteristics of the dataset. Explore the data through statistical summaries, visualization techniques, and basic data exploration methods. Identify patterns, trends, relationships, and potential outliers in the data. EDA helps in gaining insights and formulating hypotheses for further analysis.

Example: Explore the data using visualizations and statistical summaries to identify patterns and relationships.

Validation and Iteration: Validate the results and conclusions of the analysis. Cross-check findings using different approaches, perform sensitivity analyses, or validate the model against new data. Iterate and refine the analysis if necessary, incorporating feedback from stakeholders or considering additional factors.

Example: Validate the model's performance using validation datasets or through A/B testing.

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1.4 Applications of Data Analytics:

Data analytics has a wide range of applications across various industries and domains. Here are some common areas where data analytics is widely used:

Business Intelligence: Data analytics is extensively used in business intelligence to gain insights into market trends, customer behavior, and competitive landscapes. It helps businesses make informed decisions, optimize operations, and improve overall performance.

Financial Analysis: Data analytics plays a crucial role in financial analysis by analyzing financial data, detecting fraud, predicting market trends, and assessing investment opportunities. It helps financial institutions, investment firms, and businesses make data-driven decisions in areas such as risk management, portfolio optimization, and fraud detection.

Marketing and Customer Analytics: Data analytics enables businesses to understand customer preferences, segment customers, and personalize marketing strategies. It helps in targeted advertising, customer segmentation, customer lifetime value analysis, sentiment analysis, and market basket analysis, among others.

Healthcare Analytics: In the healthcare industry, data analytics helps in improving patient outcomes, optimizing resource allocation, and enhancing operational efficiency. It can be used for disease prediction and prevention, patient risk stratification, clinical decision support, drug discovery, and optimizing healthcare delivery systems.

Supply Chain and Operations Analytics: Data analytics aids in optimizing supply chain management by analyzing data on inventory levels, demand patterns, logistics, and supplier performance.

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II.OVERVIEW OF THE PROBLEM:

2.1 Problem Study:

The aim of this survey is to investigate the current patterns and implications of smartphone usage in education, with a focus on understanding the benefits, challenges, and overall impact of incorporating smartphones as learning tools in various educational settings and also analyze the challenges associated with the educational usage of smartphones

2.2 Challenges/Need of the study:

The challenges faced during this project was lack of quick responses from people, which resulted in delays in completing my internship project work and also analyze that student use their smartphones for education in positive manner.

Goal:

The goal is to understand smartphone usage patterns determine how frequently students use smartphones for educational purposes, including accessing educational apps, online resources, and communication with teachers and peers.

Objective:

- To measure the usage of smartphone for educational purposes
- To analyze the improvement of overall learning experience.
- To find the necessity of educational apps in a smartphone
- Smartphone apps performance to enhance the productivity in studies
- To analyze smartphone to collaborate with classmates or peers for educational purposes

2.3 Hardware / System Requirements:

It has 11th Gen Intel(R) Core (TM) i3-1115G4 @ 3.00GHz 3.00 GHz processor with 8.00GB RAM and 64-bit operating system, x64-based processor system type.

2.4 Software, Tools and Libraries Requirements:

The software used in this summer internship project is MS Excel (version 2019), Jupyter notebook

About excel pivot table and pivot charts:

Types in excel:

- Forecasting.
- Pivot table.
- Pivot chart.
- Solver.
- Data analysis.

In this project analysis by using pivot table, pivot chart.

Pivot table:

A pivot table In Excel is a powerful tool that allows you to summarize and analyze large amounts of data in a structured and organized manner. It helps to extract meaningful insights from your data by providing a flexible way to manipulate and present.

Pivot chart:

A pivot chart is a graphical representation of data that is created from a pivot table. It allows to visualize and analyze data in a more interactive and dynamic way.

Jupyter notebook:

Jupyter Notebook is an interactive computing environment that allows you to create and share documents containing live code, visualizations, explanatory text, and more. It provides a convenient way to combine code, text, and visual elements in a single document.

III. DATA PREPARATION:

3.1 Data Collection Approaches:

Data collection is approached by using the survey questionnaire the title of my survey questionnaire is “Educational usage of smartphone”.

The link for my survey questionnaire

<https://forms.gle/bfTT1PyfFt4BNHHi8>

Number of people response to my survey question is “Two hundred thirty”

FIELD DEFINITION:

1. Timestamp

This column field definition explains the information that is used to provide assurance of timeliness.

2. Name

This column field definition tells about the name of the persons.

3. College student and school student

This column field definition tells whether he is college student or school student.

4. Usage

This column field definition tells about how often the students use their smartphone for the educational purpose.

5. Educational activities

This column field definition tells about how the college student and school student use their smartphone for educational activities.

6. Educational apps

This column field definition tells about what are the educational apps They used in smartphone for studies.

7. Productivity in studies

This column field definition tells about how the collage student and school student use their smartphone app for productivity in studies.

8. Educational Collaboration Apps

This column field definition tells about how the students use their smartphone to collaborate with classmates.

9. Educational Smartphone Features

This column field definition tells about how the smartphone feature Find more useful for educational purpose.

10. Educational platforms

This column field definition tells about what are educational app they used for their studies.

11. Compared to traditional methods

This column field definition compare the traditional methods with smartphone educational apps and also tell which is best.

12. share educational content

This column field definition tells that whether students share their educational content with their friends (or) with other ones.

13. Online educational

This column field definition tells about that the student use their smartphone for participate in online educational forums or communities.

14. Learning experience

This column field definition tells about how the smartphone improve their overall learning experience among collage students and school students.

15. educational videos or tutorials

This column field definition tells about how often they use their smartphone for watching the educational videos or tutorial by both college student and school student.

16. Recommended educational apps

This column field definition tells about that the collage student and school use their educational mobile apps recommended by their institution

17. Well-integrated in formal education

This column field definition tells about how well integrated smartphones for education to both college and school student.

18.Valuable tool for lifelong learning

This column field definition tells that smartphone are valuable for learning tool for life long.

3.2 Data Method:

In this project, exploratory Data analysis(or)EDA is used. Exploratory Data Analysis (EDA) is a process in data analysis that involves examining and visualizing data to gain insights and understand its characteristics. It is an initial step before applying more advanced analytical techniques. They use various techniques, such as data visualization, summary statistics, and exploratory statistical analysis, to gain a better understanding of the dataset. Data visualization plays a significant role in EDA, as it allows analysts to represent the data graphically. This includes examining correlations, associations, and dependencies through techniques such as scatter plots, correlation matrices, and cross-tabulations. EDA helps in identifying potential issues or data quality problems, such as missing values, outliers, or inconsistencies.

Here are some common types of EDA techniques:

- 1.Univariate Analysis.
- 2.Bivariate Analysis.
- 3.Multivariate Analysis.
- 4.Descriptive Statistics.

In this project analyze by using Bivariate analysis.

Bivariate Analysis:

Bivariate analysis is a statistical method used to analyze the relationship between two variables. It focuses on examining the association, correlation, or dependency between two variables and understanding changes in one variable may relate to changes in the other variable.

The purpose of bivariate analysis is to explore the strength, direction, and significance of the relationship between two variables. It helps researchers or analysts gain insights into the nature of the relationship and determine if there is a statistically significant association between the variables.

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3.3 Purpose of Data:

The purpose of collecting data on the educational usage of smartphones for both college and school students through survey questions is to gain insights into how these devices are being utilized in educational settings specifically by students. This survey can help to understand how college and school students are using smartphones for educational purposes by analyzing this data, it becomes possible to evaluate the impact of smartphone usage on learning outcomes. It also compares with the traditional methods of educational resource such as libraries, books with smartphone educational apps.

IV.METHODOLOGY:

4.1 Descriptive Analysis:

Descriptive analysis refers to the process of summarizing and describing the main characteristics, features, and patterns within a dataset. It aims to provide a comprehensive overview of the data, allowing researchers or analysts to gain insights and understand the key aspects of the variables under investigation. It involves calculating various statistical measures and visualizing the data using graphs, charts, and tables. Descriptive analysis helps researchers, analysts, and decision-makers gain insights into the dataset's central tendencies, distributions, variations, and other important features.

Here are some common techniques used in descriptive analysis:

- Measures of Central Tendency
- Distribution
- Data visualization
- Descriptive Statistics
- Cross-Tabulation

In this project analyze by using data visualization, cross-tabulation.

Data visualization:

Graphs and charts, such as bar charts, pie charts, line graphs, and scatter plots, are used to visually represent the data and identify patterns, trends, and relationships.

Cross-Tabulation:

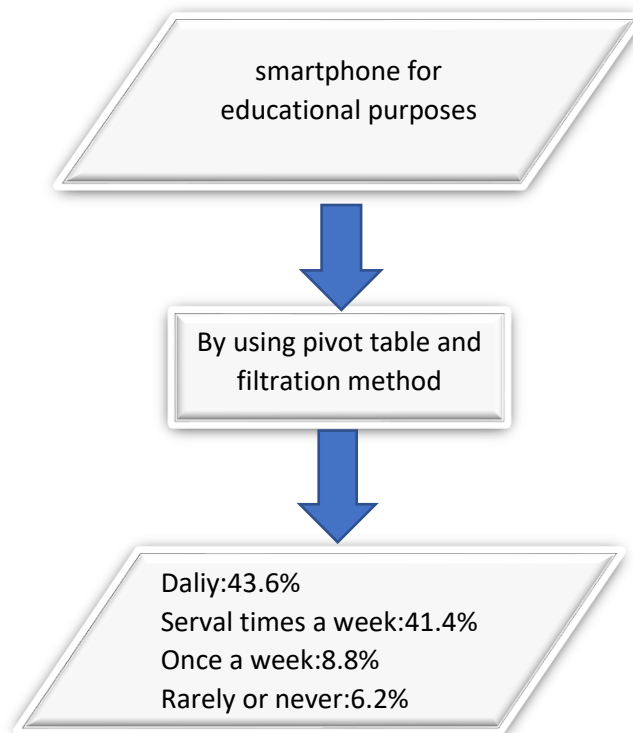
This technique is used to analyze the relationship between two or more variables by creating a contingency table that displays the frequency distribution of each combination of variables.

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1) To measure the usage of smartphone for educational purposes:

Flowchart:



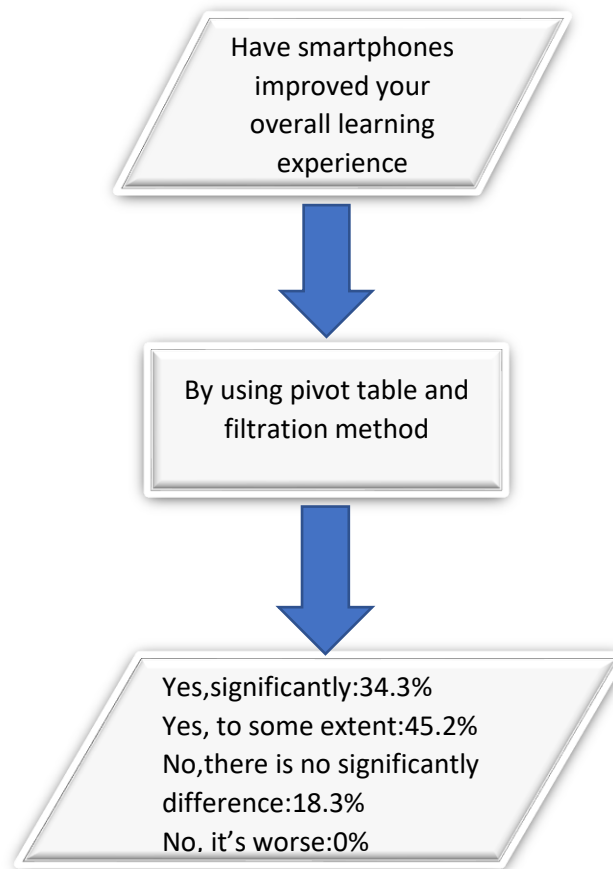
Algorithm:

STEP 1: By giving the input that how often do the college student school student use their smartphone for educational purpose.

STEP 2: Processing the input by using pivot table and filtration method.

STEP 3: After processing the output out of 230 responses the college student select daily is 66 and school student 35, For several time a week college student select 62 and school student select 32, Once a week college student select 9 and school student select 11, Rarely or never college student select 3 and school student select 11 Blank select by college 1.

2) To analyze the improvement of overall learning experience:



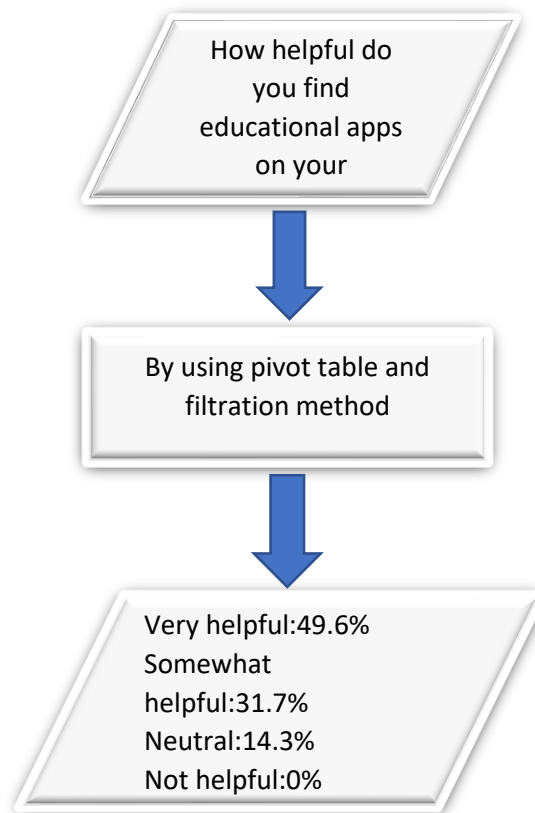
Algorithm:

STEP 1: By giving the input have smartphones improved your overall learning experience

STEP 2: Processing the input by using pivot table and filtration method.

STEP 3: After processing the output out of 230 responses the college student select Yes, significantly is 53 and school student 26, Yes, to some extent college student select 67 and school student select 37, No college student selects 18 and school student select 24, No, it's worse college student selects 3 and school student select 2.

3) To find the necessity of educational apps in a smartphone:



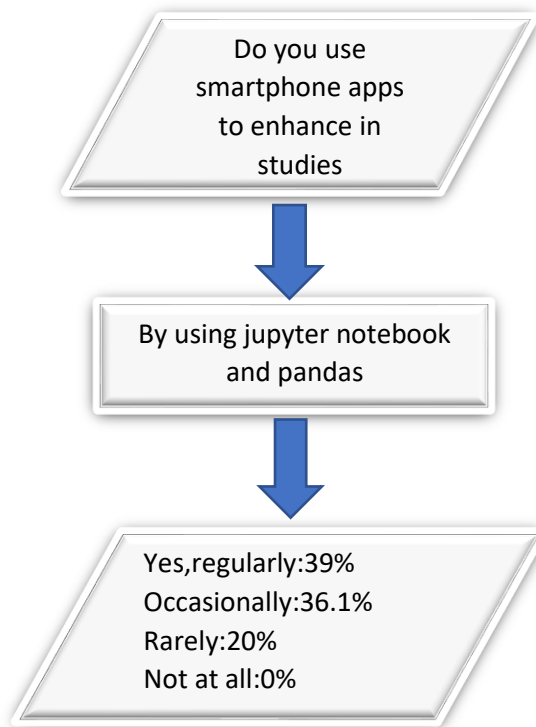
Algorithm:

STEP 1: By giving the input how helpful do you find educational apps on your smartphone.

STEP 2: Processing the input by using pivot table and filtration method.

STEP 3: After processing the output Out off 230 responses the college student select Very helpful 77 and school student 37, Somewhat helpful college student select 42 and school student select 31, Neutral college student select 16 and school student select 17, Not helpful at all college student select 6 and school student select 4.

4) Smartphone apps performance to enhance the productivity in studies:



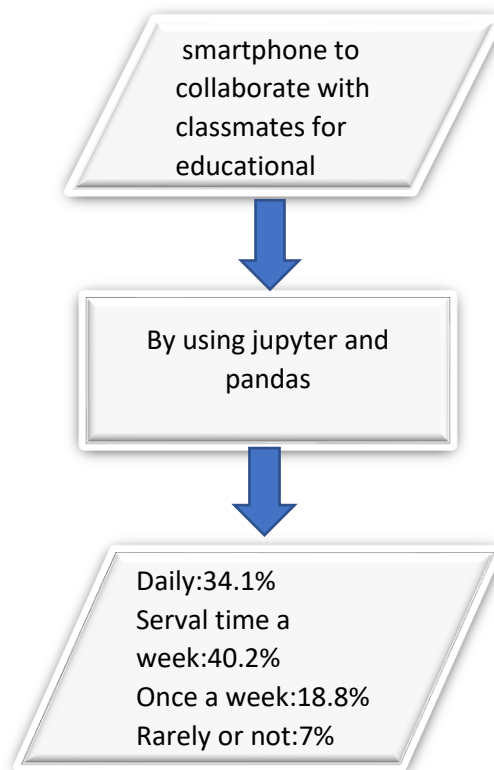
Algorithm:

STEP 1: By giving the input do they use smartphone apps to enhance in their studies

STEP 2: Processing the input by using Jupyter notebook and Pandas.

STEP 3: After processing the output the college student select Yes, regularly is 66 and school student 25, Occasionally college student select 49 and school student select 34, Rarely college student select 21 and school student select 25, Not at all college student select 5 and school student select 5.

5) To analyse smartphone to collaborate with classmates or peers for educational purposes:



Algorithm:

STEP 1: By giving the input how often use smartphone to collaborate with classmate for educational purpose

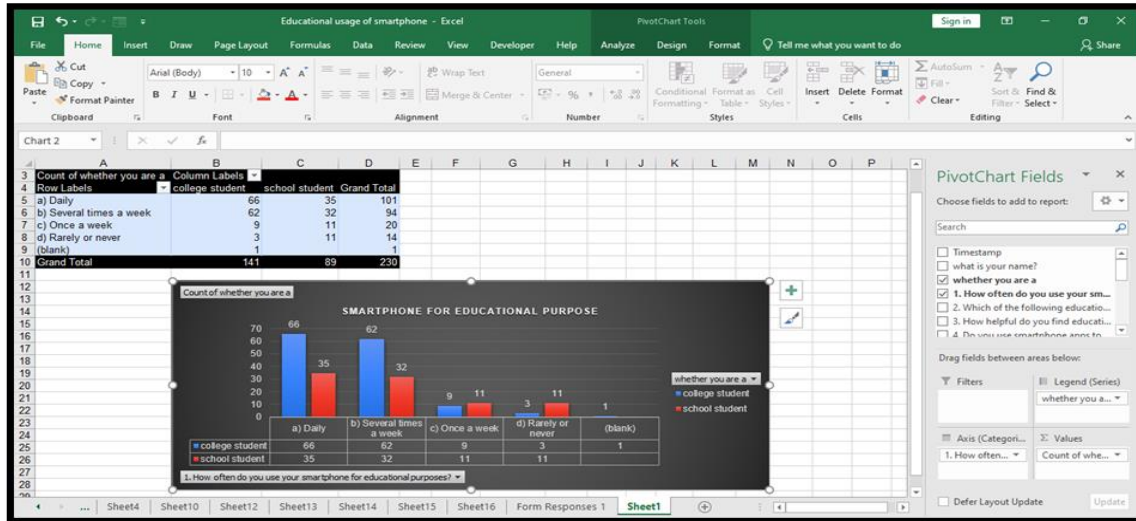
STEP 2: Processing the input by using Jupyter notebook and Pandas.

STEP 3: After processing the output the college student select Daily is 52 and school student 26, Serval time a week college student selects 55 and school student select 38, Rarely college student selects 25 and school student selects18, Not at all college student select 9 and school student select 7.

IV. RESULTS, FINDING INSIGHTS & DISCUSSION:

EXCEL:

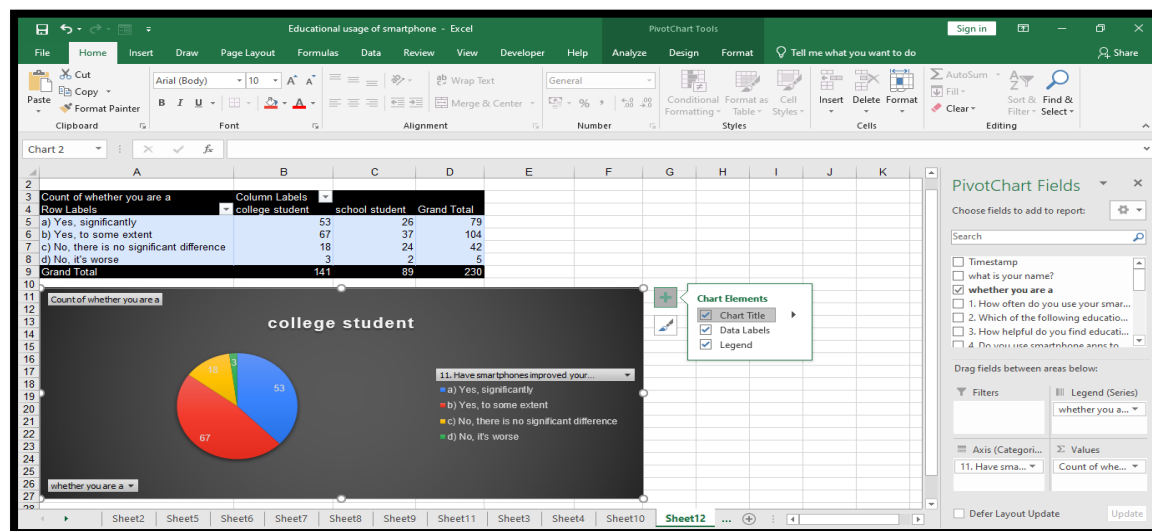
1) To measure the usage of smartphone for educational purposes.



(Fig.no:1)

Description: Analyze that the majority of college and school students utilize their smartphones on a daily basis for educational purposes.

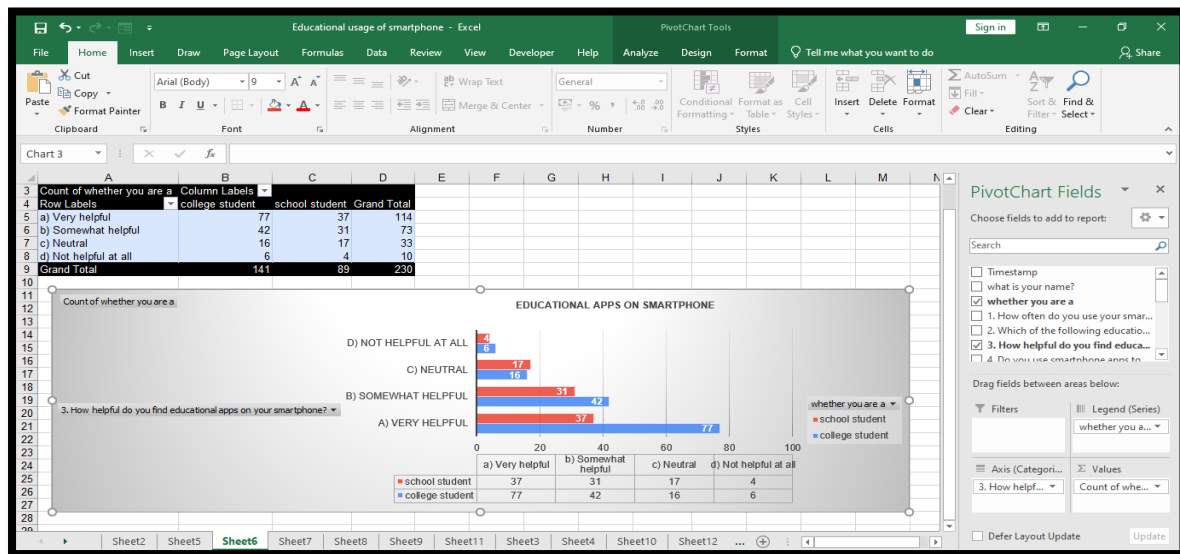
2) To analyse the improvement of overall learning experience.



(Fig.no:2)

Description: analyze that most of the college student and school student Yes to some extent that improve their learning experience in smartphone.

3) How helpful do you find educational apps on your smartphone.

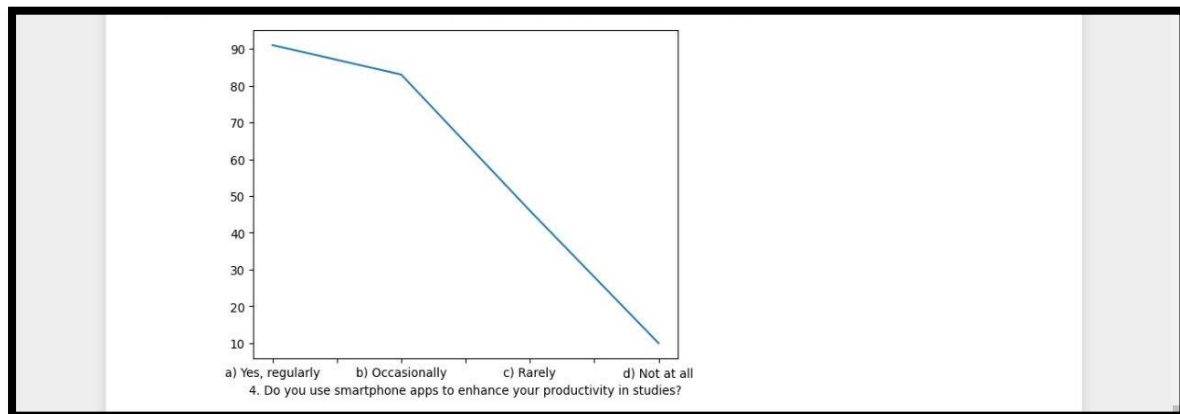


(Fig.no:3)

Description: After analyzing both college students and school students find educational apps highly beneficial in their academic performance.

Python:

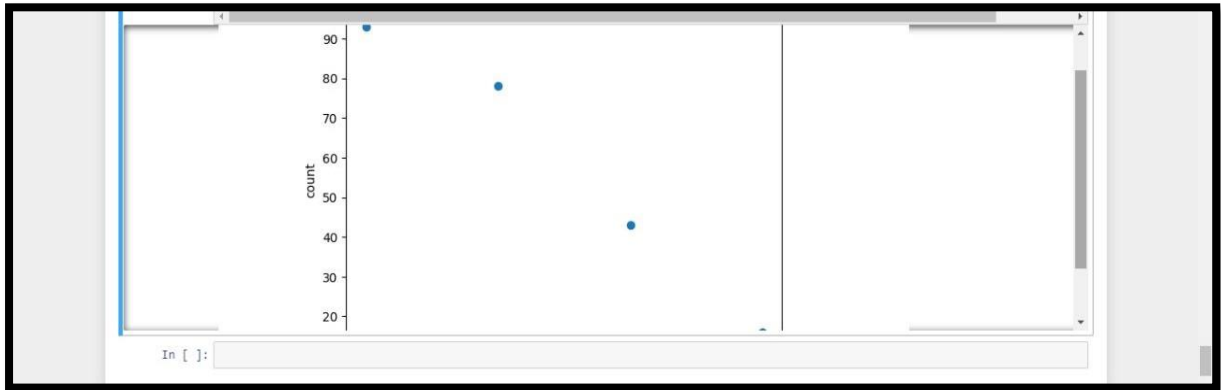
1)Do you use smartphone apps to enhance your productivity in studies.



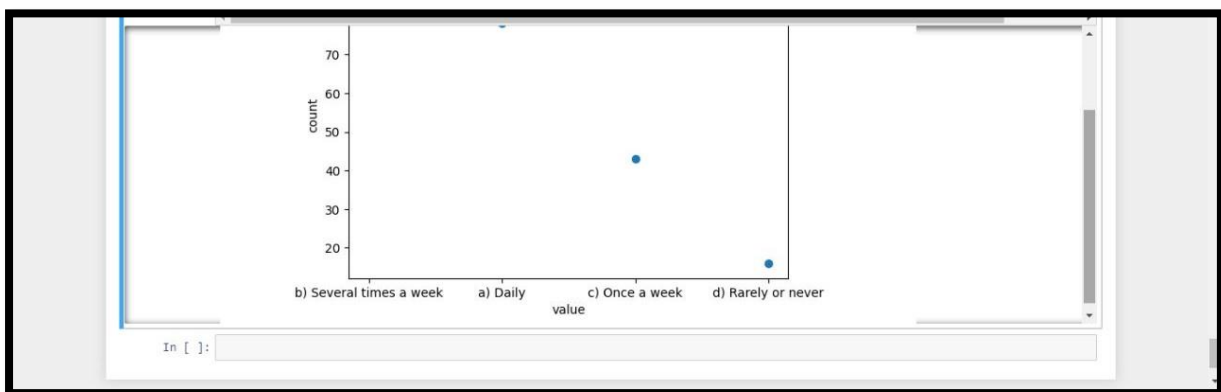
(fig.no:4)

Description: After analyzing both college students and school students actively utilize smartphone apps on a regular basis for educational purposes.

2) To analyze smartphone to collaborate with classmates or peers for educational purposes:



(Fig.no:5)



(Fig.no:1.5)

Description: After analyzing most college students and school students use their smartphones to collaborate with classmates or peers for educational purposes several times a week.

VI. SUMMARY & CONCLUSION:

Summary:

The survey topic "Educational usage of smartphones" aims to investigate the impact and potential benefits of using smartphone for education. The survey collects data related to smartphone for education purpose usage among college and school students and analyzes their perceptions regarding its benefits, limitations, and impact on the educational system. The survey utilizes data analytics approaches, including data collection through a Google form and descriptive analysis using MS Excel pivot table and pivot chart and by using Jupyter Notebook and pandas and matplotlib. The survey reveals that 43.6% of student's daily use smartphone for educational purpose and 6.2% student select rarely or selected, However, 49.6% of students find helpful educational app on their smartphone and 4.3% selected not helpful at all. Among the students, 39.6% enhance their smartphone apps as their productivity in studies and 4.3% selected not at all, 40.2% of students collaborate with their classmates for educational purpose and 7% of them rarely collaborate with their classmates. 45.2% of students find that overall their learning experience is improved 2.2% of students tells that it does not improve their Overall learning experience, 90% of students are in favor for using of smartphone for educational purpose, while 10% are not.

Conclusion:

The survey findings indicate that smartphones play a significant role in the educational lives of both college and school students. These devices are widely used for accessing information, organizing tasks, utilizing learning apps, and engaging in collaborative learning. However, it also compares with the traditional educational method with smartphone educational apps. The results suggest that leveraging the educational potential of smartphones while addressing these concerns can contribute to a more effective and engaging learning experience for students.

VII. REFERENCES:

(Refer.no-1)

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<https://chat.openai.com/share/3b2b4ebc-9072-42d2-bc80-4363605eebb4>

APPENDIX:

This tells about the queries or methods used in this internship project

Sample data query in excel:

This project is done in excel in MS excel. Analysing part has be done by using pivot table and pivot chart.

- How often do you use your smartphone for educational purposes
- Have smartphones improved your overall learning experience
- How helpful do you find educational apps on your smartphone

This project is done In jupyter note book. Analysing part has be done by using pandas.

- **Do you use smartphone apps to enhance your productivity in studies**

```
df['4. Do you use smartphone apps to enhance your productivity in studies?'].value_counts().plot(kind='line')
```

- **How often do you use your smartphone to collaborate with classmates or peers for educational purposes**

```
Value_counts=df['5. How often do you use your smartphone to collaborate with classmates or peers for educational purposes'].value_counts()
```

```
df_value_counts=pd.DataFrame({'value':value_counts.index,'count':value_counts.values})
```

```
plt.scatter(df_value_counts['value'],df_value_counts['counts'])
```

```
plt.xlabel('value')
```

```
plt.ylabel('count')
```

```
plt.title('scatter plot of smartphone to collaborate with classmates or peers for educational purposes')
```

```
plt.show()
```

