BHARATIYA VIDYA BHAVAN'S
SARDAR PATEL INSTITUTE OF TECHNOLOGY
(Empowered Autonomous Institute Affiliated to University of Mumbai)
[Knowledge is Nectar]
Department of Computer Engineering

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Aim:

Design Big Data Dashboards using Power BI / Power BI / R / Python / D3.js on the datasets - Education sector

- Basic - Bar chart, Pie chart, Histogram, Time line chart, Scatter plot, Bubble plot
- Advanced - Word chart, Box and whisker plot, Violin plot, Regression plot (linear and nonlinear), 3D chart, Jitter
- Write observations from each chart

Theory:

Dataset:
https://www.kaggle.com/datasets/sujaradha/online-education-system-review

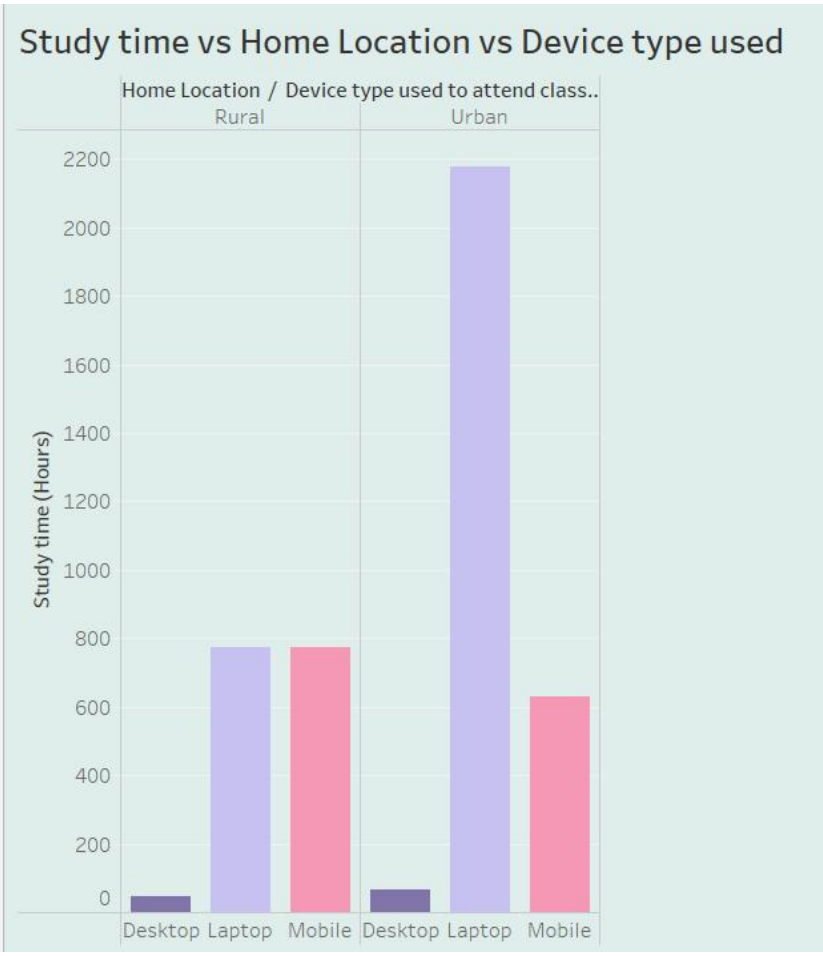
Dataset Overview:

1. Pandemic has influenced all spheres of the humanity. COVID-19 impacted the education vertical in larger manner. Traditional classroom environment plays a very vital role in molding the life of an individual. Bond nurtured in the early ages of the life acts as the great moral support in the latter stages of the journey. As the pandemic has forced us into online education, this data collection aims to analyze the impact of online education. To check out the satisfactory level of the learners, review was conducted.
2. Gender – Male, Female
   Home Location – Rural, Urban
   Level of Education – Post Graduate, School, Under Graduate
   Age – Years
   Number of Subjects – 1- 20
   Device type used to attend classes – Desktop, Laptop, Mobile
   Economic status – Middle Class, Poor, Rich
   Family size – 1 -10
   Internet facility in your locality – Number scale (Very Bad to Very Good)
   Are you involved in any sports? – Yes, No

Do elderly people monitor you? – Yes, No
Study time – Hours
Sleep time – Hours
Time spent on social media – Hours
Interested in Gaming? – Yes, No
Have separate room for studying? – Yes, No
Engaged in group studies? – Yes, No
Average marks scored before pandemic in traditional classroom – range
Your interaction in online mode - Number scale (Very Bad to Very Good)
Clearing doubts with faculties in online mode - Number scale (Very Bad to Very Good)
Interested in? – Practical, Theory, Both
Performance in online - Number scale (Very Bad to Very Good)
Your level of satisfaction in Online Education – Average, Bad, Good

Charts:

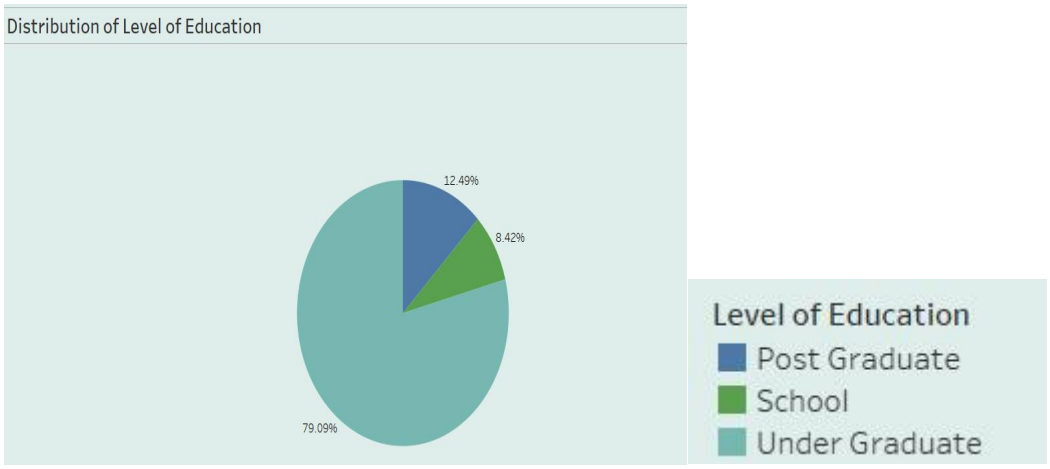
1. **Study time vs Home Location vs Device type used:**
   a. Chart:



   b. **Observations:**

- In both rural and urban locations, laptops are the most commonly used devices for attending classes, followed by mobile devices.
- Urban students spend significantly more study time on laptops than those in rural areas.
- Desktop usage is minimal in both rural and urban settings.

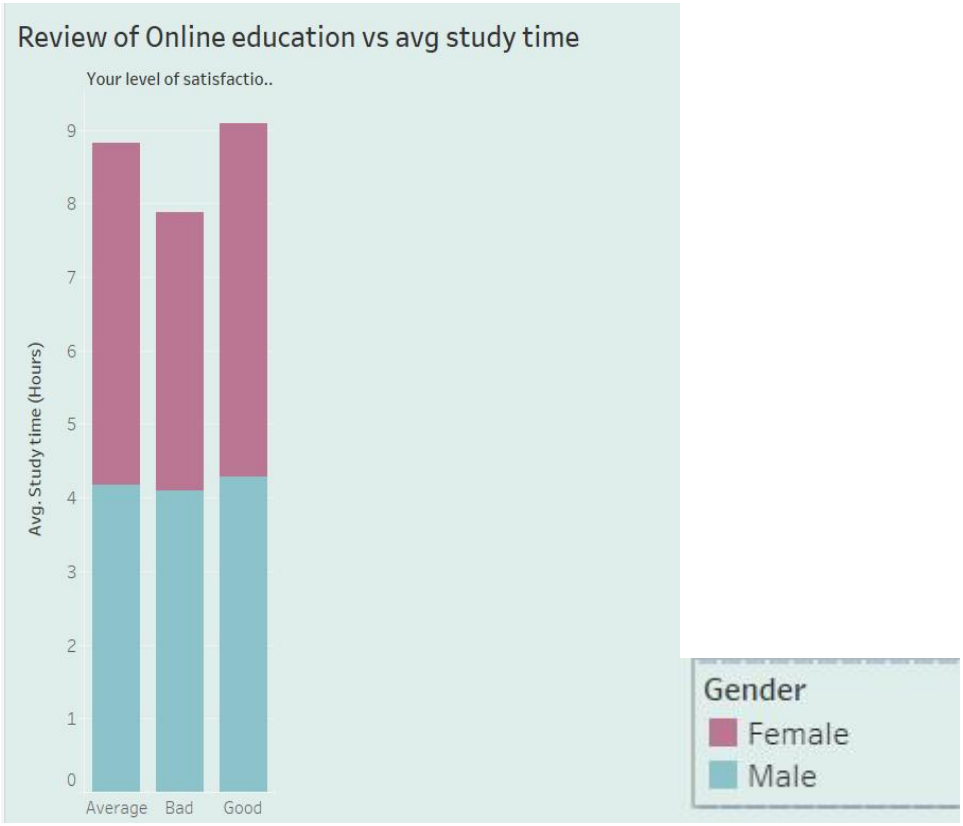
2. Distribution of Level of Education(Pie Chart)

a. 

b. Observations:

- The majority of students fall into the "Undergraduate" category, making up approximately 79% of the sample.
- "School" students represent around 12.49%, and "Postgraduate" students make up 8.42%.
- This distribution suggests that the data is skewed towards undergraduate-level students.

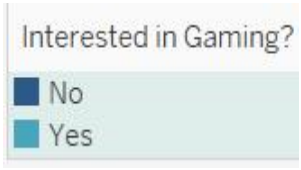
3. Review of Online Education vs Avg Study Time(Stacked Bar Chart)

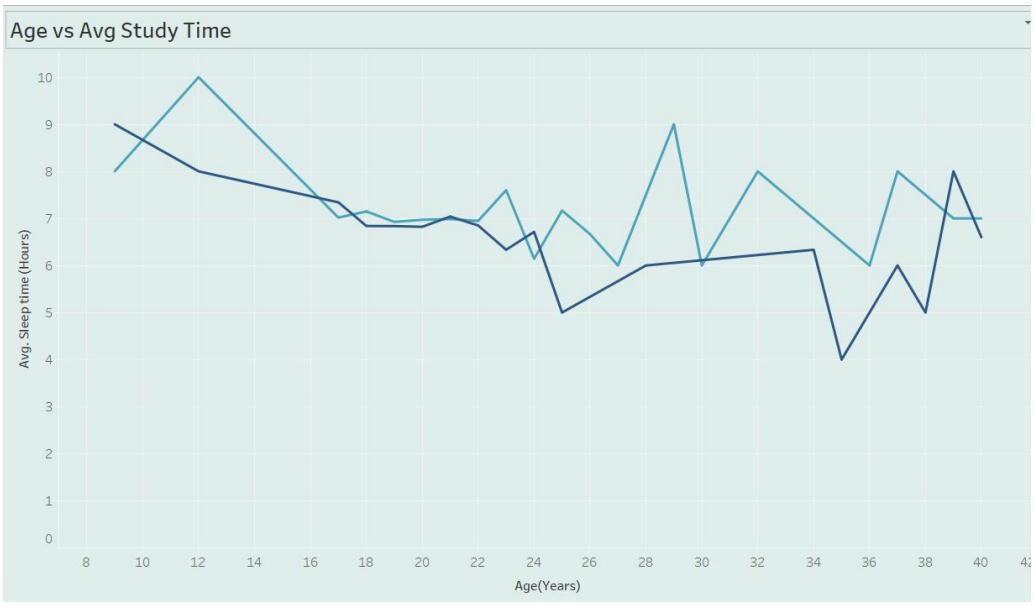
a. 

b. Observations:

- Satisfaction levels (categorized as "Average," "Bad," and "Good") do not seem to impact average study time significantly, as the study hours are roughly similar across satisfaction levels.
- There may be a slight tendency for those with "Good" satisfaction to spend marginally more study time on average.

4) Age vs Avg Study Time:(Line Plot)

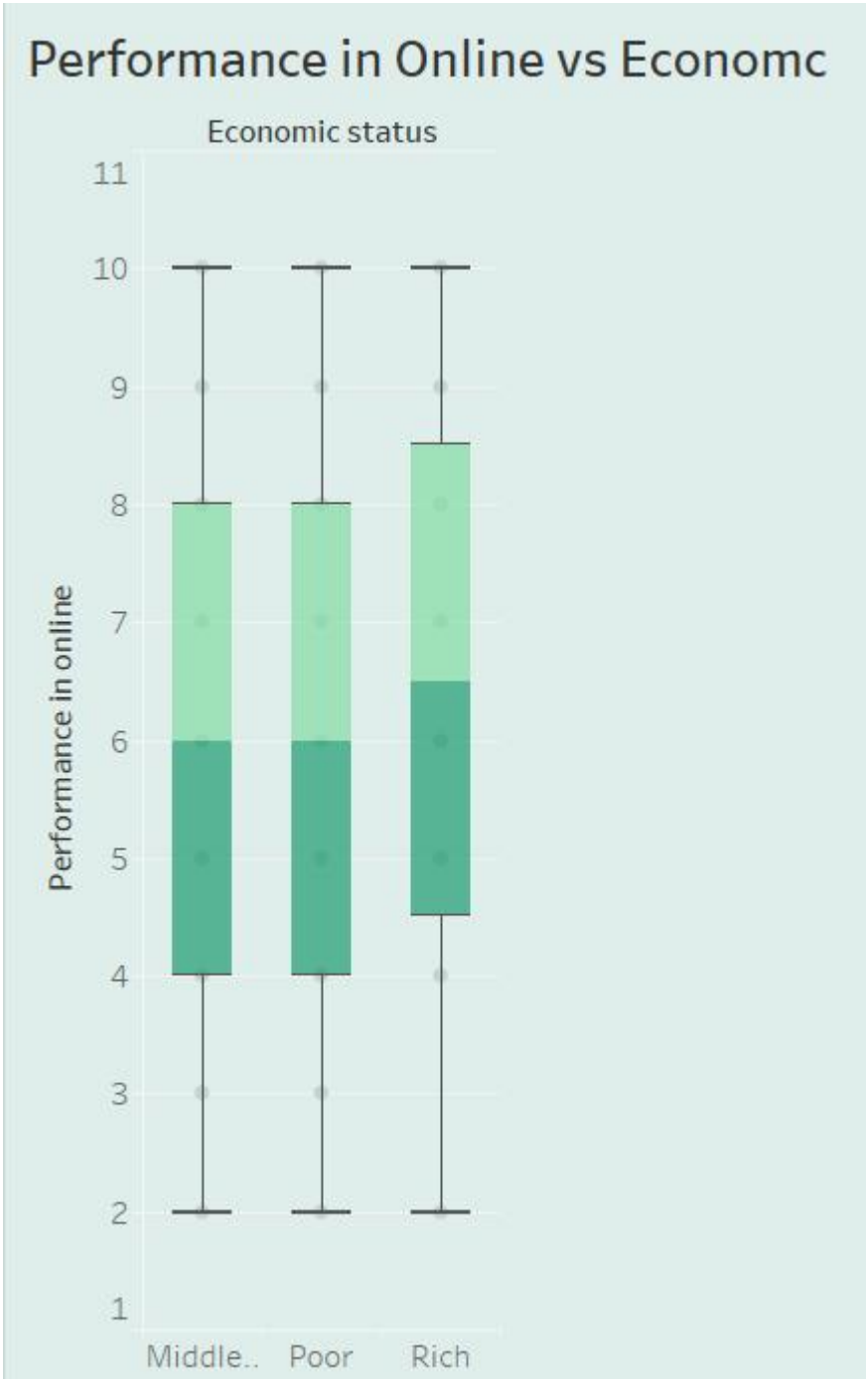
c. 



d. Observations:

- Average study time generally decreases with age, peaking around age 10 and steadily declining up to age 25.
- After age 25, there are slight fluctuations, but the overall trend shows reduced study time as age increases.

4. **Performance in Online vs Economic Status:(Box plot)**

a. 

b. Observations:

- Students from middle-class, poor, and rich economic backgrounds show similar performance distributions in online settings.
- The boxplots for each economic status have similar ranges, medians, and quartile spreads, suggesting that economic status does not have a strong impact on online performance.

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Dashboard:

Conclusion:

The analysis and Tableau dashboard reveal that factors like study habits, device type, economic background, and age significantly impact student performance in online education. Urban students with laptops study more, and younger students generally dedicate more time to studying. While satisfaction with online education doesn't directly affect study hours, economic status influences access to resources, indirectly impacting performance. Overall, these findings highlight the importance of ensuring access to digital tools, supportive learning environments, and tailored support to enhance online learning outcomes.