

# Unveiling The Virtual Classroom: An In-Depth Analysis of the Online Education System

## Enhancing Online Education in the Digital Age

### ➤ Define Problem / Problem Understanding

- Specify the business problem

#### To Improve the Effectiveness and Accessibility of Online Education.

Technology and online courses have been crucial lifelines for students throughout the lockdown, keeping them in school despite the constraints. However, the shift to online education has brought its own set of difficulties and possibilities. While technology has made it possible to keep learning, it has also made clear how important it is to have a thorough awareness of all of its advantages, disadvantages, opportunities, and difficulties.

- Business requirements

- Ensure that all students, regardless of their location, socioeconomic status, or physical capabilities, have fair access to online education.
- Create a solid technology foundation to support online learning platforms.
- Identify the elements that affect how effective online learning is, such as instructor preparation, student motivation, and the caliber of the resources available.
- Examine the possibilities for enhancing the value and usability of online education through the use of technology.

- Literature Survey

Reviewing pertinent academic studies, research papers, reports, and articles about online education, its advantages, disadvantages, opportunities, and difficulties would constitute a literature assessment for the project on improving online education in the digital age. The major subjects and conclusions that could be covered in such a literature review are briefly summarized as follows:

- Studies looking at how the digital divide affects fair access to online education. Research into measures to give underserved communities internet connectivity and devices, as well as methods to close the access gap.
- Study of the technical needs for efficient online education. An examination of the infrastructural issues that educational institutions encountered when switching to online learning.
- Studies assessing the efficacy of programs for online teacher preparation. Best practices in online pedagogy research, including techniques for boosting connection and engagement with students.
- Research on the creation and evaluation of excellent online learning resources. Case studies of organizations employing procedures for online course quality assurance.
- Studies showing how data analytics may be used to tailor online learning experiences. Studies on the effects of individualized learning on student engagement and performance. Analysis of privacy issues and cybersecurity vulnerabilities in online education.
- Studies on privacy protections and security measures for student data. Studies on the advantages of global cooperation and online collaboration in education. Successful online global learning programs as examples. Research into funding and revenue models for online learning programs.

- Case studies of organizations securing financial stability through online education. Literature on creating inclusive and accessible online courses for all learners, including those with disabilities. Studies on how easily accessible online content affects student achievement.
- The success of online education is influenced by a variety of factors, including:
  - \* Student motivation: Online learners are more likely to succeed if they are driven to study.
  - \* Teacher preparation: Teachers who have received training in online instruction are more likely to be successful in this type of learning environment.
  - \* Online learning resources' caliber: The success of students depends on the caliber of the online learning materials.
  - \* Interaction with instructors and peers: Students who have the chance to interact with instructors and peers are more likely to succeed in online learning.
  - \* Flexibility: For certain students, online education may be more accommodating than traditional face-to-face instruction.
  - \* Technological support: In order to excel in online education, students must have access to dependable technological help.
- Social or Business Impact
  - Greater access to education: People who reside in remote areas or who face other obstacles to attending traditional schools may find it easier to acquire education online. This can contribute to a more just and equitable society by reducing educational disparity.
  - The initiative can ensure that people with disabilities or special learning requirements can engage fully in educational experiences by addressing concerns of accessibility and inclusivity in online education, promoting a more equal society.
  - Market Development: The market for online education is expanding, providing opportunities for educational institutions and online learning platforms. These organizations can expand and modify their offerings with the aid of the project's findings.
  - Competitive Advantage: Businesses who make investments to raise the standard and accessibility of online education will have an advantage over rivals in the education market. More students and partners may be attracted by good word of mouth and reputation.
  - Savings: Setting up effective online education programs can result in financial savings on things like infrastructure, transportation, and physical facilities. This may lower the cost of and ensure the financial viability of education.
  - Improvement in employee satisfaction: Online education can aid in this improvement. Employees who have access to online education, for instance, might be more motivated and interested in their profession.

## ➤ Data Collection

- Collect the dataset

Data contains all the meta information regarding the columns described in the CSV files. we have prepared 1 CSV files: ONLINE EDUCATION SYSTEM REVIEW.csv

Column Description for Online education system review:

- Gender: Gender of the student
- Home Location: Rural or Urban.
- Level of Education: UG, PG or school
- Age: age of the student
- Number of subjects:

- Device Type Used: device used to attend the online classes
- Economic status: economic status of the family
- Internet facility in your locality
- Are you involved on any sports
- Family Size
- Do elderly people monitor you?
- Study Time(hours)
- Sleep time (hours)
- Time spent on social media(hours)
- Interested in gaming?
- Have a separate room for studying?
- Engaged in group studies?
- Average marks scored before pandemic in traditional classroom
- Your interaction in online mode
- Clearing doubts with faculties online?
- Interested in?
- Performance in online
- Your level of satisfaction in online education

- Connect data with IBM cognos

The screenshot shows the IBM Cognos Analytics interface. At the top, there's a header bar with tabs for "Student Dashboard", "My IBM", and "Home". Below the header, the URL is us3.ca.analytics.ibm.com/bi/?perspective=home. The main content area has a dark background with a white sidebar on the right. The sidebar contains a user profile for "Pradnya D. Bormane" with the email pradnya.bormane@alssmsoit.org and links for "Profile and settings", "My schedules and subscriptions", "Log my session", "About", "Manage product subscription", "Privacy", "Cookie Preferences", and "IBM Cognos Analytics Mobile". At the bottom of the sidebar is a "Log out" button. The main content area features a large speech bubble icon with three dots, a text input field with "Ask a question", and a button with an arrow. Below this is a section titled "Get quick answers with the Assistant" with the sub-instruction "Ask the Assistant a question in your own words to uncover insights about your data.". At the very bottom of the page, there's a footer with sections for "Introduction to Cognos Analytics" (with a "Get started" button), "Watch video", and "Product tour". The bottom right corner shows the date 9/10/2023 and the time 3:22 PM.

Student Dashboard | My IBM | Home

### IBM Cognos Analytics

Upload data and start creating content

Create content from existing data

Recent

View all content

Last Accessed 9/9/2023, 4:53 PM

Last Accessed 9/9/2023, 4:43 PM

Last Accessed 9/9/2023, 4:33 PM

Last Accessed 9/9/2023, 4:11 PM

Last Accessed 9/9/2023, 4:01 PM

Last Accessed 9/9/2023, 3:41 PM

Last Accessed 9/9/2023, 10:03 AM

Last Accessed 9/6/2023, 12:48 PM

82°F Very high UV

Search

82°F Very high UV

ENG IN 3:25 PM 9/10/2023

This screenshot shows the IBM Cognos Analytics interface. At the top, there are three tabs: 'Student Dashboard', 'My IBM', and 'Home'. Below the tabs is a search bar and a navigation bar with icons for search, help, and user profile. The main area is titled 'Recent' and displays four content items: 'Online\_Education\_System\_report', 'online\_Education\_System\_Revie...', 'Story: online\_Education\_System\_Revie...', and 'ONLINE EDUCATION SYSTEM REVIEW.csv'. Each item has a small icon, a last accessed date, and a 'CSV' button. Below this is another row of items: 'Online\_Education\_System\_Revie...', 'Online\_Education System\_review\_dashboard', 'Online\_Education\_system\_revie...', and 'Online\_Education\_System\_review'. The bottom of the screen shows a taskbar with various application icons and system status indicators like battery level and network connection.

Student Dashboard | My IBM | Home

### IBM Cognos Analytics

New

Data module

Explore Data module

Exploration

Present

Dashboard

Report

Story

Get started Watch video Product tour

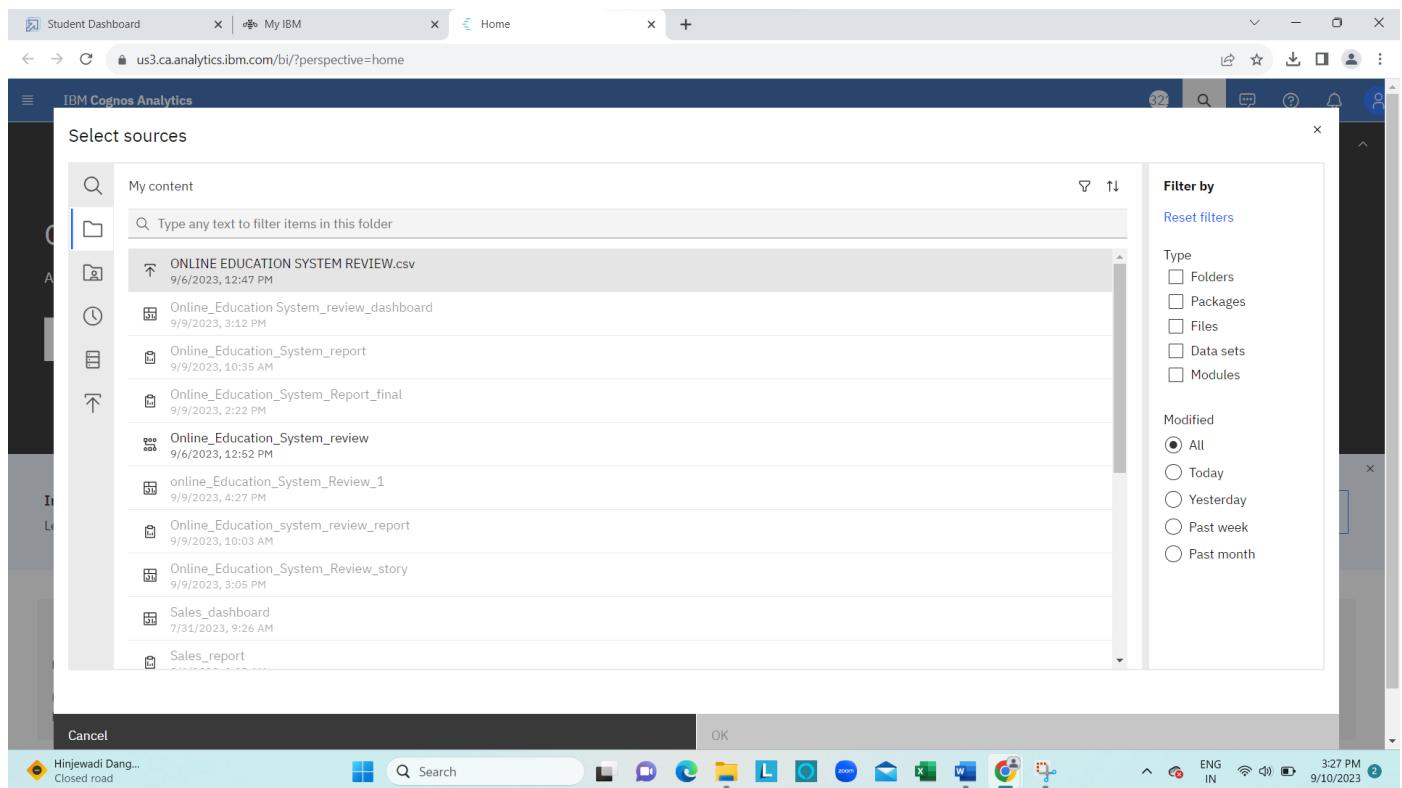
Hinjewadi Dang... Closed road

Search

82°F Very high UV

ENG IN 3:26 PM 9/10/2023

This screenshot shows the 'New' page in the IBM Cognos Analytics interface. On the left is a navigation sidebar with links for 'Home', '+ New', 'Upload data', 'Content', 'Recent', and 'Manage'. The main area is titled 'New' and features a large 'Data module' button highlighted with a blue border. Below it are other options: 'Explore', 'Exploration', 'Present', 'Dashboard', 'Report', and 'Story'. To the right is a large, dark central area with a speech bubble icon. At the bottom are three buttons: 'Get started', 'Watch video', and 'Product tour'. A sidebar on the right contains a 'Create content from existing data' section with instructions about locating data sources. The bottom of the screen shows a taskbar with application icons and system status indicators.



## ➤ Data Preparation

- Prepare the Data for Visualization

Once we upload the data into the data module, we will encounter the interface shown in the below image:

The screenshot shows the IBM Cognos Analytics interface. At the top, there are three tabs: 'Student Dashboard', 'My IBM', and 'Online\_Education\_System\_review'. The 'Online\_Education\_System\_review' tab is active. The main area is titled 'Data module' and contains a tree view of data objects under 'geos Online\_Educ...stem\_review'. The objects listed include: Navigation paths, ONLINE ED...VIEW.csv, # Row Id, Gender, Home Location, Level of Education, Age(Years), Number of Subjects, Device ty... classes, Economic status, Family size, Internet f... locality, Are you i...y sports?, Do elderL...itor you?, Study time (Hours), and Sleep time (Hours). On the right side, there is a 'Preview data' section with a circular icon containing a grid and a checkmark. Below it, the text reads: 'To preview data, select a table, a column in a table, or a folder that contains columns.' A sidebar on the right shows the user profile 'Pradnya D. Bormane (1c...)' and various navigation links: My schedules and subscriptions, Log my session, About, Manage product subscription, Privacy, Cookie Preferences, IBM Cognos Analytics Mobile, and Log out. The system tray at the bottom shows the weather (82°F, Mostly cloudy), system icons, and the date/time (9/10/2023, 3:47 PM).

saved this data in 'My content' section as **Online\_Education\_System\_Review Preview**

This screenshot shows the 'Education data' perspective in IBM Cognos Analytics. The interface is similar to the previous one, with a 'Data module' title and a tree view of data objects under 'geos Education data'. The objects listed are identical to the ones in the 'Online\_Education\_System\_review' perspective: Navigation paths, ONLINE ED...VIEW.csv, # Row Id, Gender, Home Location, Level of Education, Age(Years), Number of Subjects, Device ty... classes, Economic status, Family size, Internet f... locality, and Are you i...y sports?. The 'Preview data' section and the right-hand sidebar are also present, showing the same user profile and navigation links.

The screenshot shows a data grid interface from IBM Cognos Analytics. The grid has columns for Gender, Home Location, Level of Education, Number of Subjects, Device type...nd classes, and Economic status. A context menu is open over the 'Level of Education' column, with 'Filter...' highlighted. The data grid contains approximately 20 rows of student information.

Gender	Home Location	Level of Education	Number of Subjects	Device type...nd classes	Economic status
Male	Urban	Under Grad	11	Laptop	Middle
Male	Urban	Under Grad	7	Laptop	Middle
Male	Rural	Under Grad	5	Laptop	Middle
Male	Urban	Under Grad	5	Laptop	Middle
Male	Rural	Under Grad	5	Laptop	Middle
Male	Urban	Under Grad	5	Laptop	Middle
Female	Urban	Under Graduate	5	Laptop	Middle
Female	Rural	Under Graduate	9	Laptop	Middle
Female	Urban	Under Graduate	4	Desktop	Middle
Male	Rural	Post Graduate	5	Mobile	Middle
Male	Urban	Under Graduate	7	Laptop	Middle

### Renaming the field

We can apply filters: Selected the type of aggregation and apply on that field

The screenshot shows the 'Properties' dialog box for a specific field. The 'General' tab is selected. Under the 'Aggregate' section, a dropdown menu is open, showing options like 'None', 'Average', 'Count', 'Count Distinct', 'Maximum', 'Minimum', and 'Total'. 'Count Distinct' is highlighted with a blue selection bar.

## ➤ Data Visualizations

Making graphical representations of data to aid in understanding and information exploration is known as data visualization.

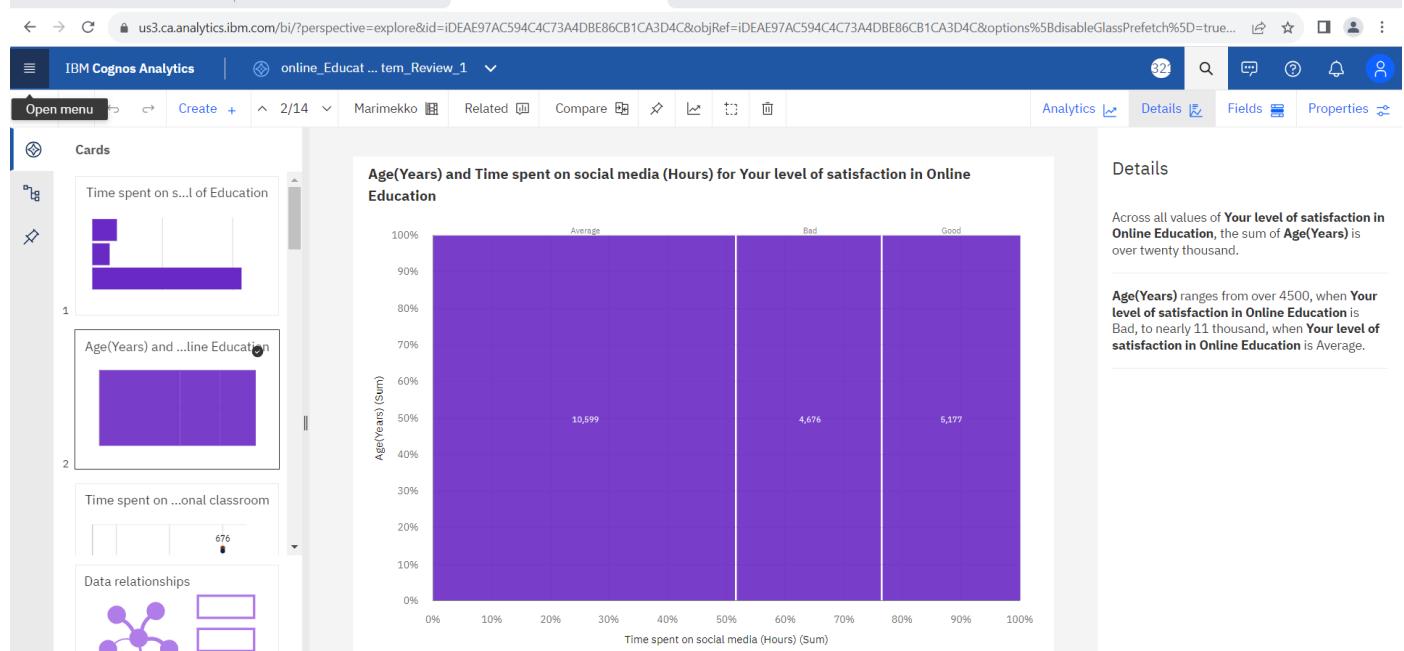
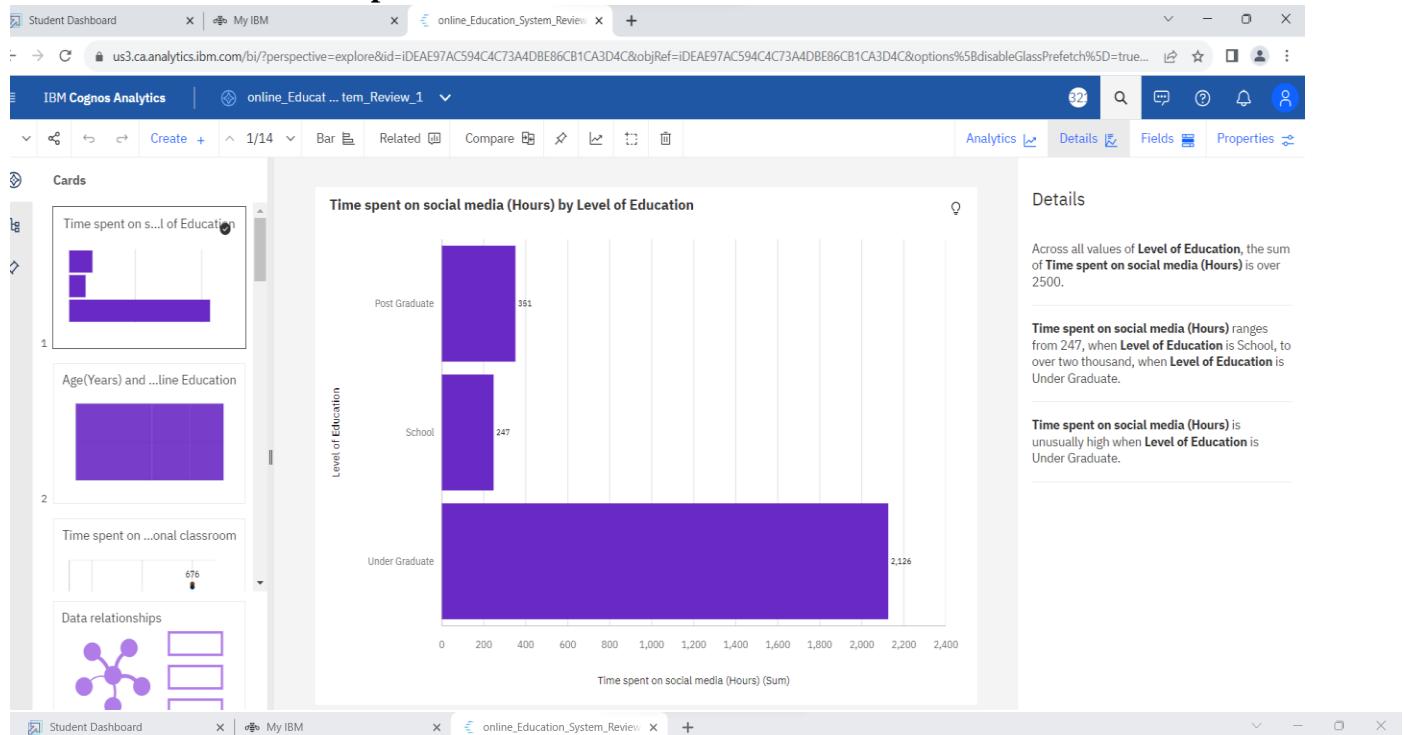
- No of Unique Visualizations

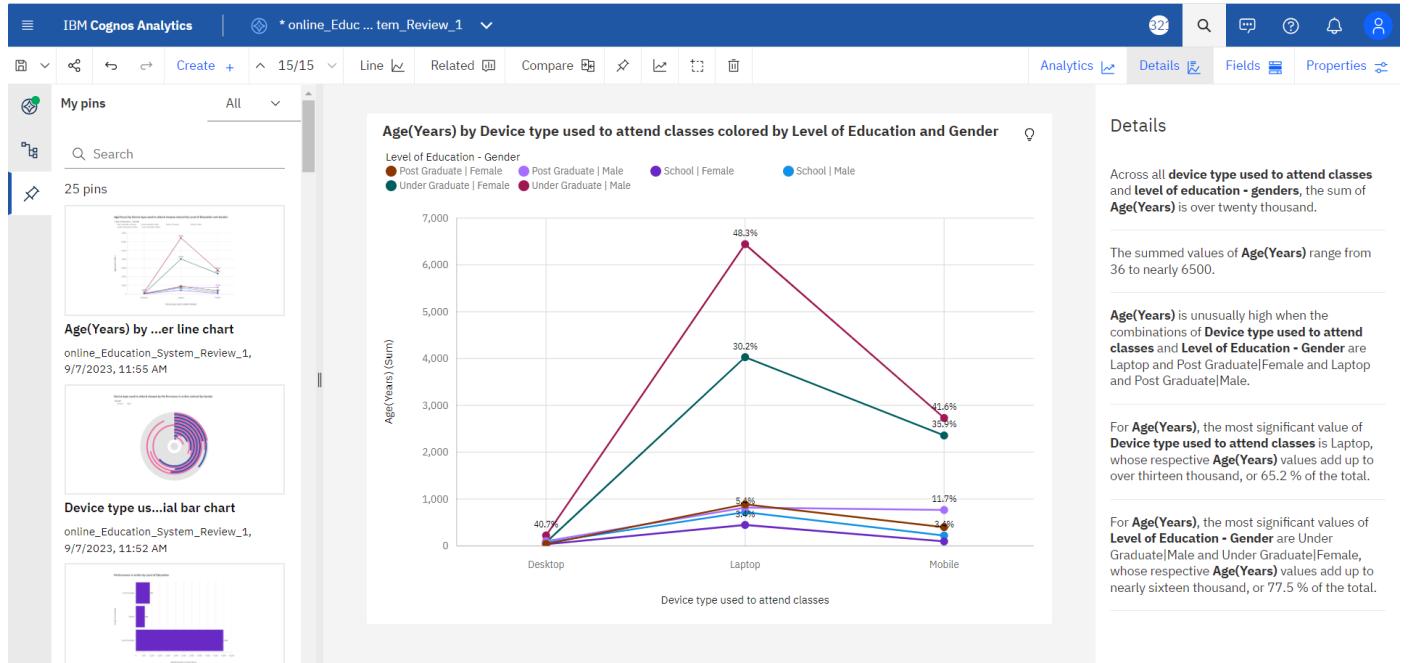
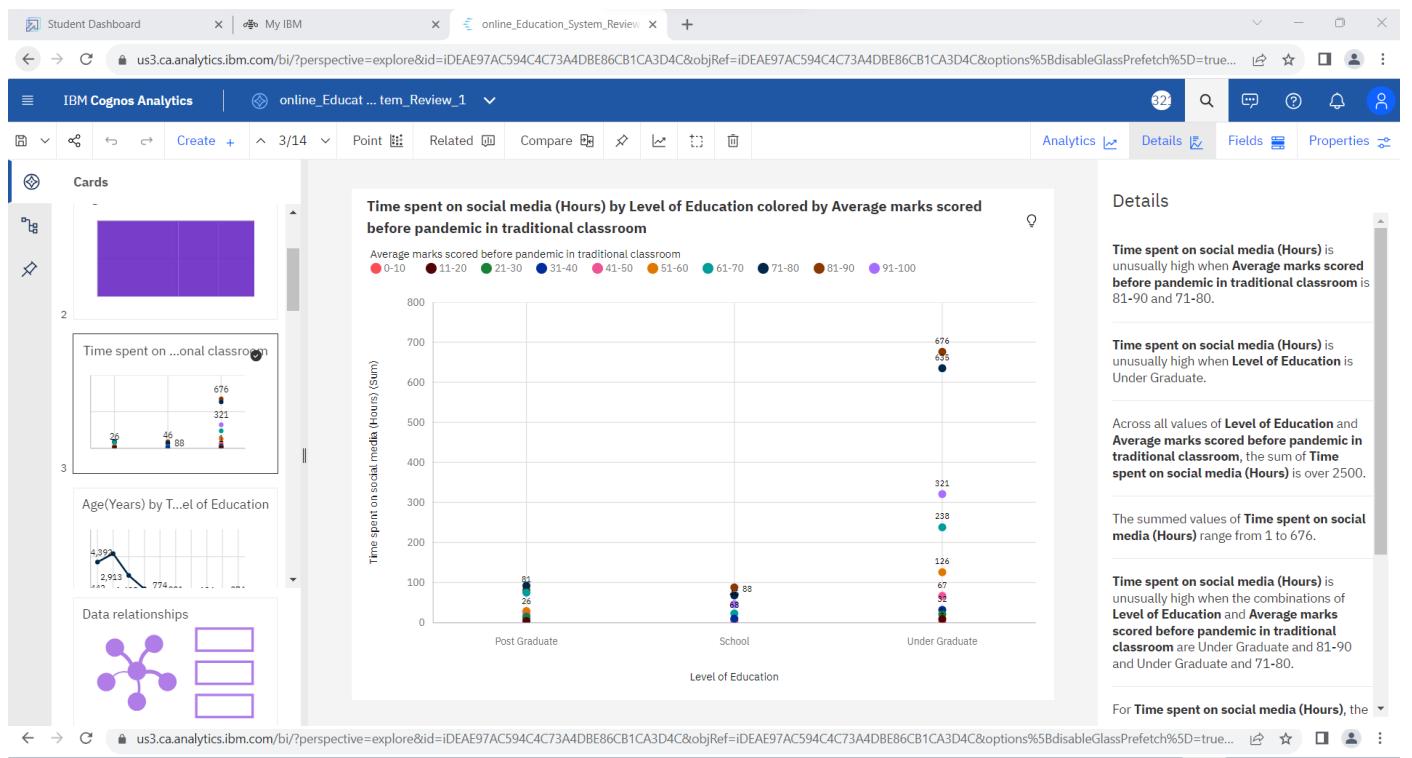
The number of unique visualizations that can be created with a given dataset.

click on explorations and select the data from ‘My Content’ and then select ‘Add’ we will be redirected to the exploration interface, then click on create and select ‘single visualization’ and then choose the visualization type

**Around 14 visualizations created.**

**Bar chart, Radial chart, Tree map, Point chart, Donut, Table, Column Chart, etc. Some are included in report below:**





Student Dashboard | My IBM | \* online\_Education\_System\_Review\_1 | +

### IBM Cognos Analytics

Create + 16/16 Radial Related Compare Details Fields Properties

**My pins** All 25 pins

Search

**Device type used to attend classes by Performance in online colored by Gender**

Gender  
Female (Blue) Male (Pink)

**Details**

The total number of results for **Device type used to attend classes**, across all **Performance in online**, is over a thousand.

Male is the most frequently occurring category of **Gender** with a count of 614 items with **Device type used to attend classes** values (59.4 % of the total).

6 (23.6 %), 8 (21.1 %), and 7 (17.5 %) are the most frequently occurring categories of **Performance in online** with a combined count of 643 items with **Device type used to attend classes** values (62.2 % of the total).

Age(Years) by ...er line chart  
online\_Education\_System\_Review\_1, 9/7/2023, 11:55 AM

Device type us...al bar chart  
online\_Education\_System\_Review\_1, 9/7/2023, 11:52 AM

Student Dashboard | My IBM | \* online\_Education\_System\_Review\_1 | +

### IBM Cognos Analytics

Create + 5/16 Table Related Compare Details Fields Properties

**Cards**

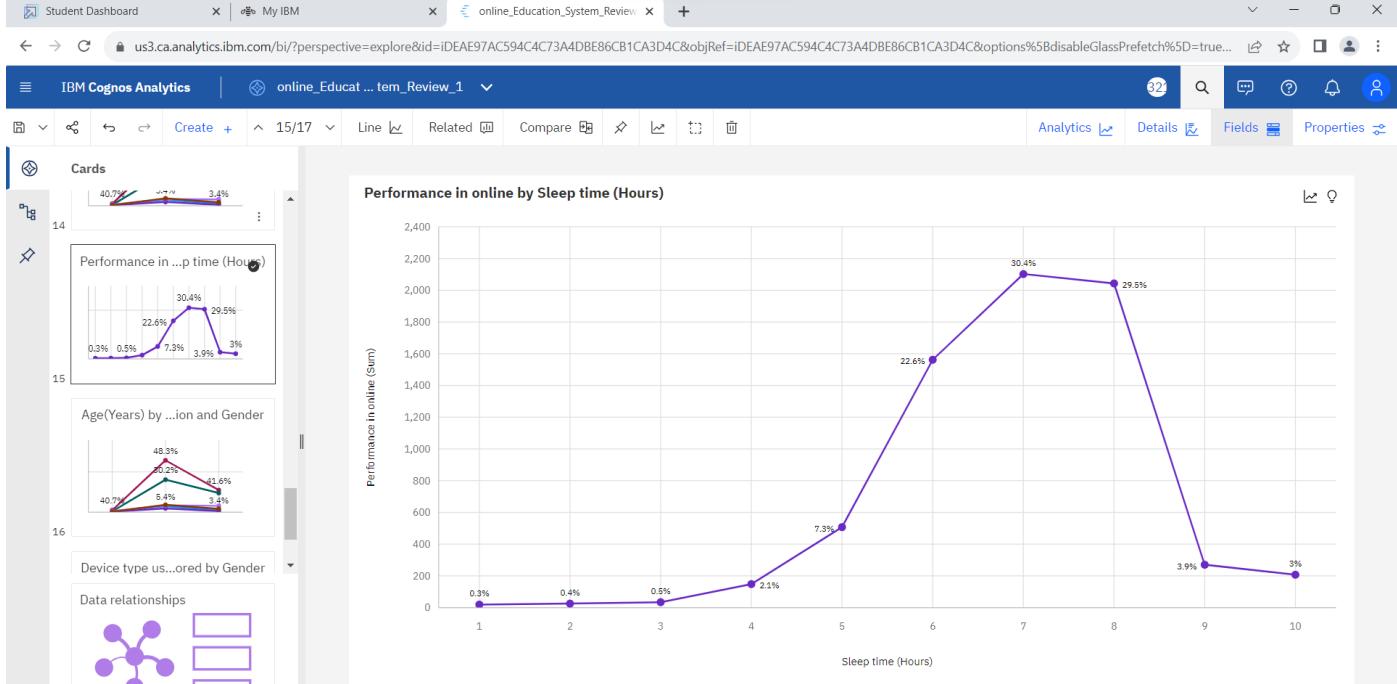
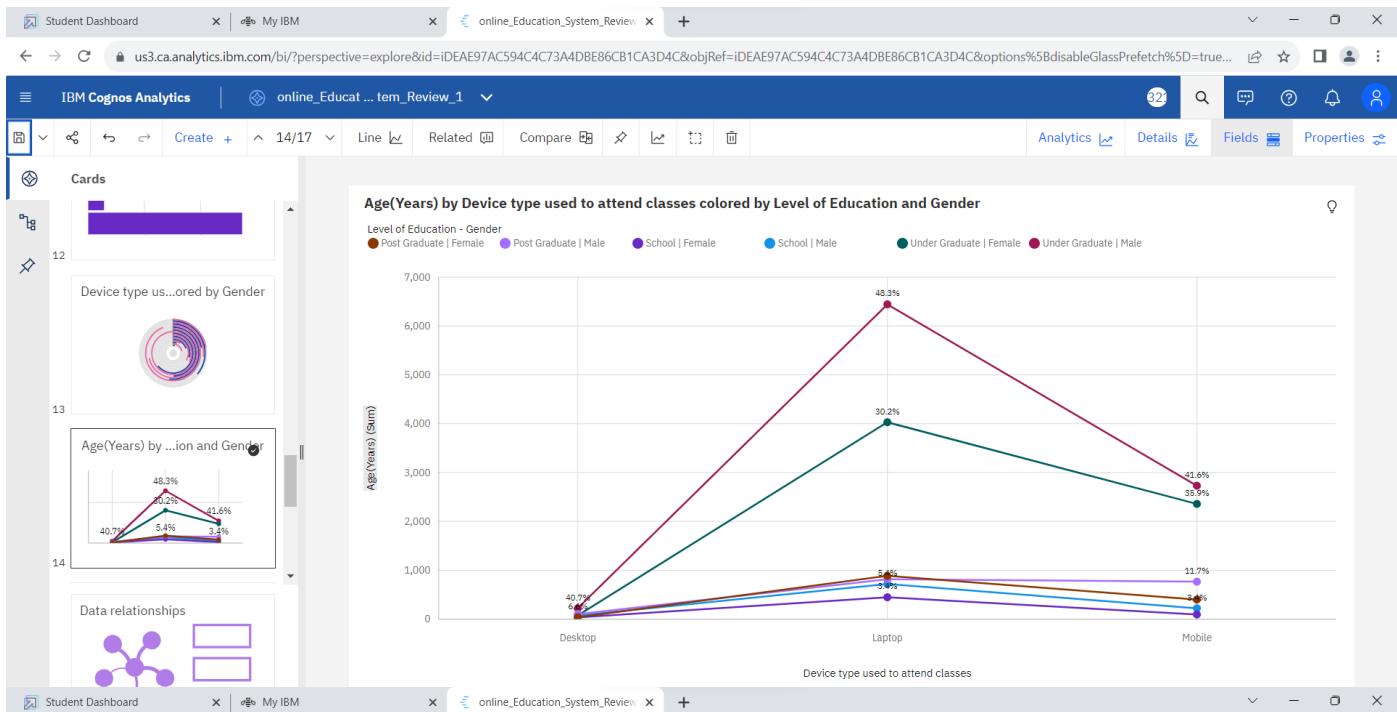
3 Age(Years) by T...el of Education

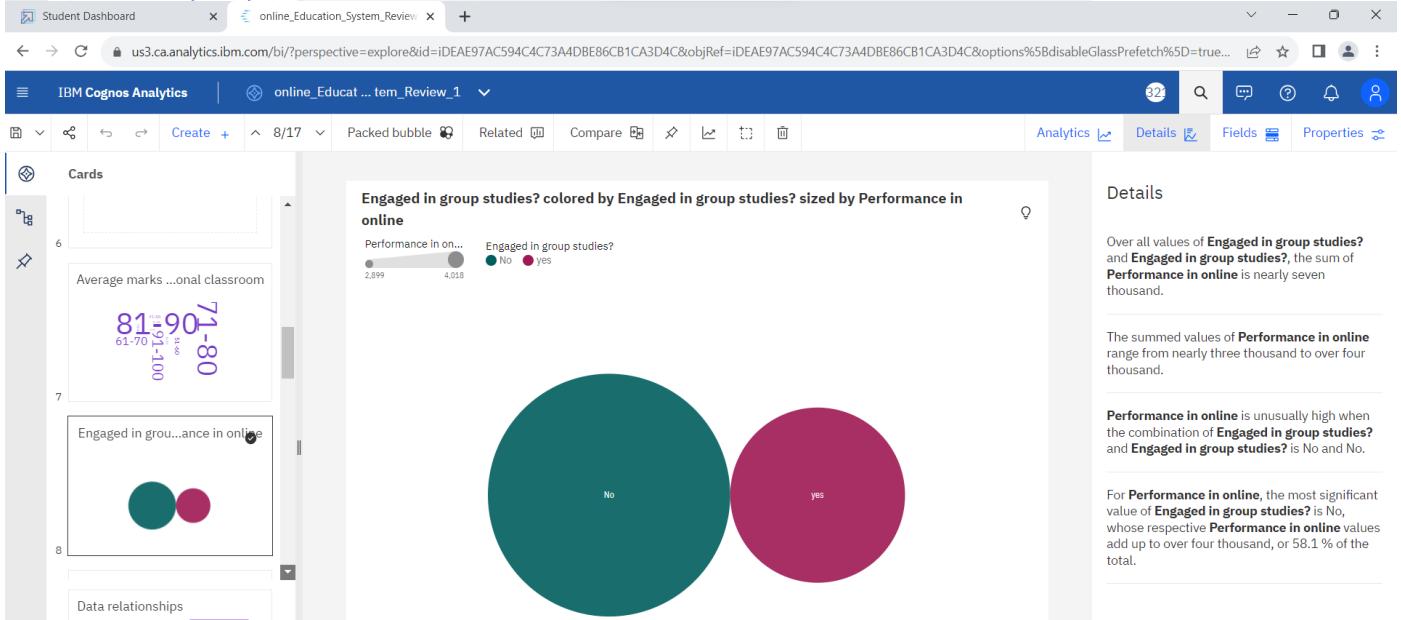
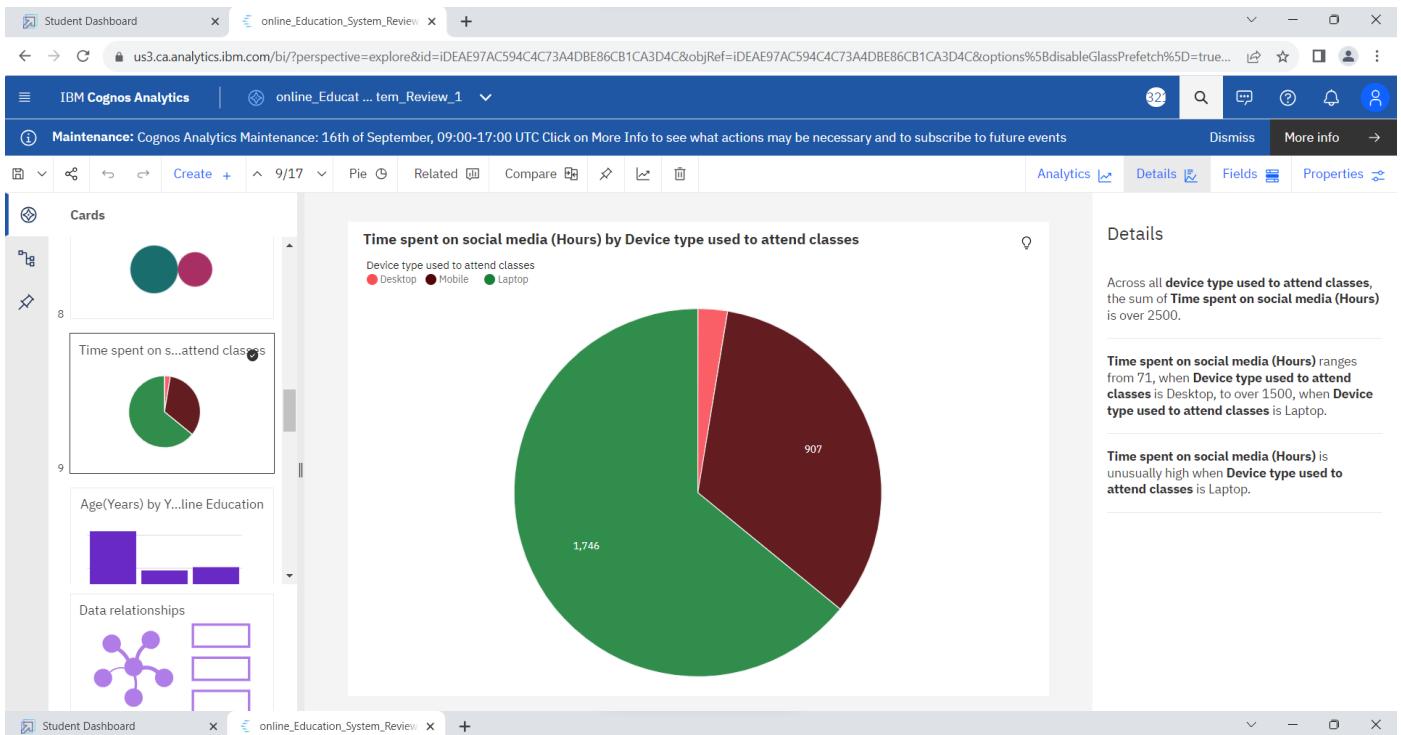
4 Economic status...ance in online

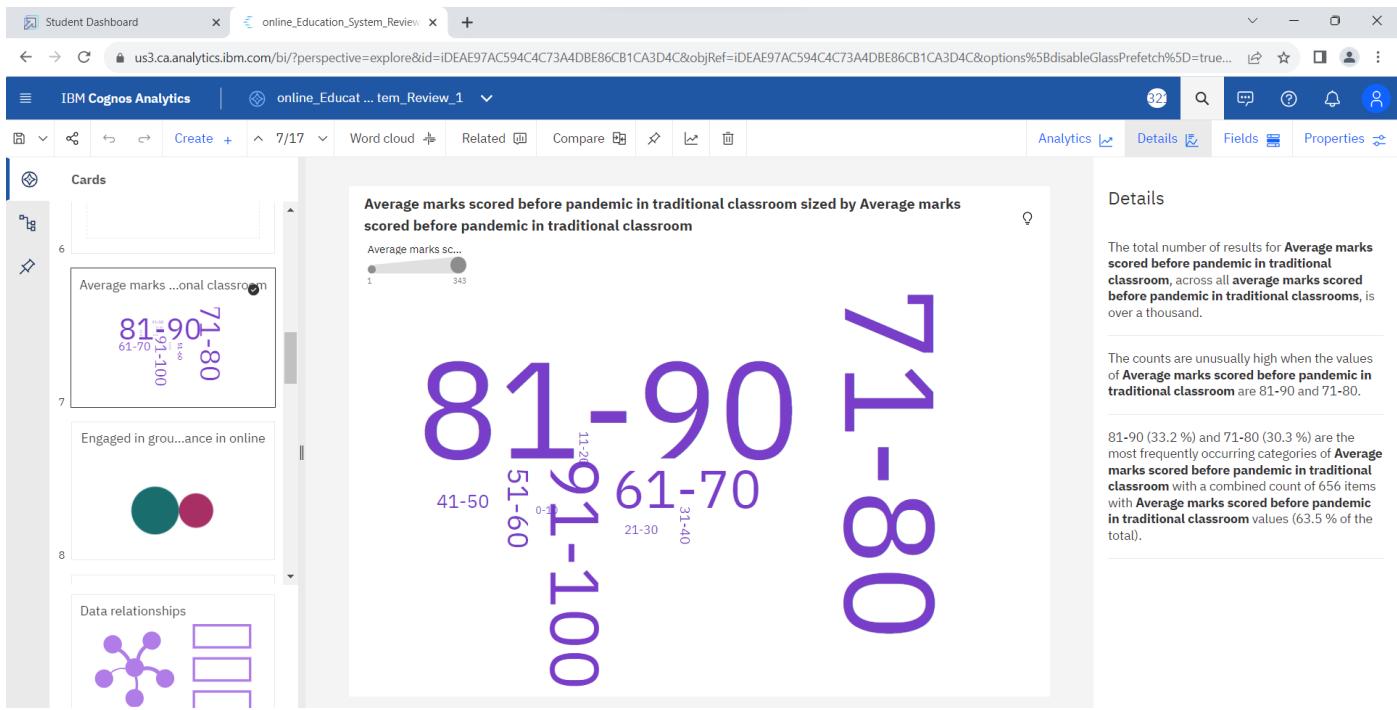
5 Average marks ...onal classroom

**Economic status, Home Location and Performance in online**

Economic status	Home Location	Performance in online
Middle Class	Rural	6.72
	Urban	6.68
<b>Summary</b>		
Poor	Rural	6.49
	Urban	6.07
<b>Summary</b>		
Rich	Rural	9
	Urban	7.11
<b>Summary</b>		
<b>Summary</b>		







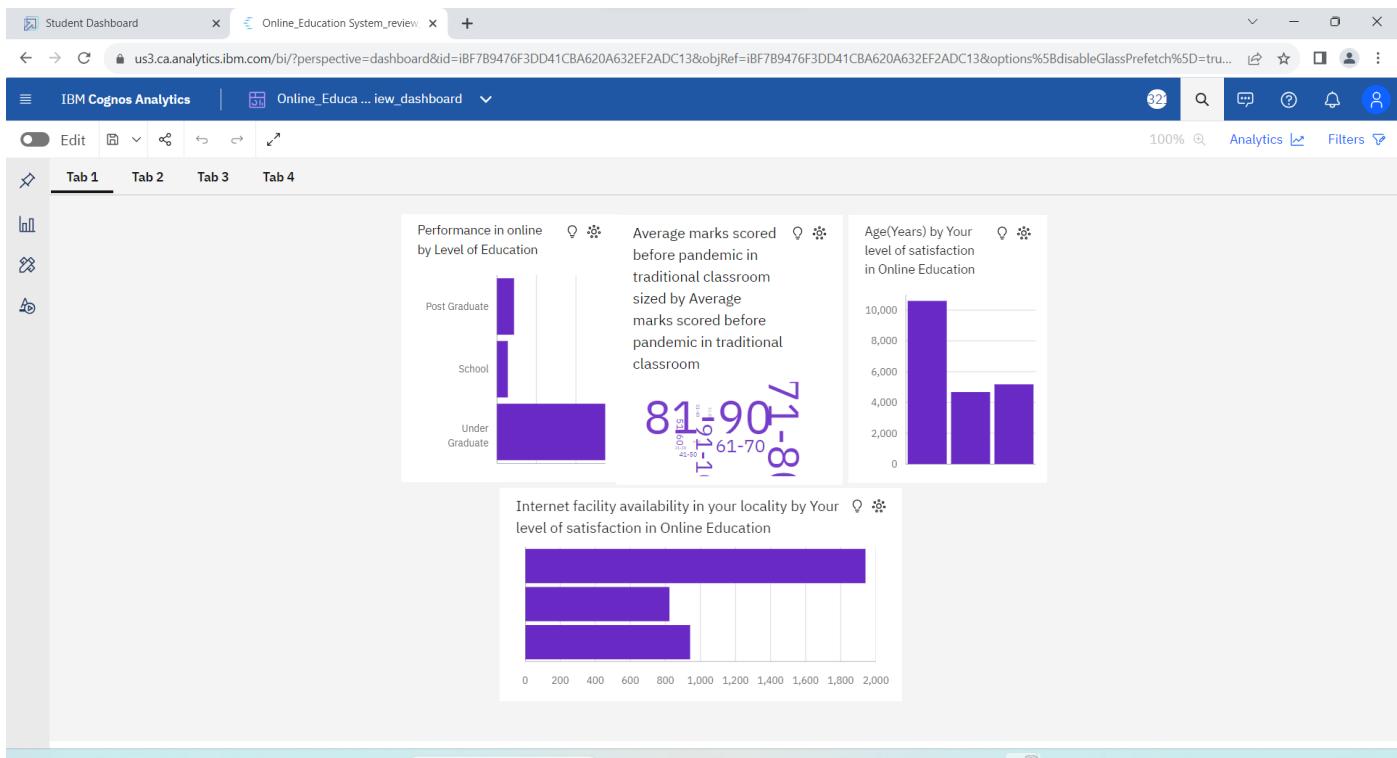
## ➤ Dashboard

A dashboard is a graphical user interface (GUI) that presents statistics and information in an ordered, comprehensible fashion. Dashboards are frequently used to provide in-the-moment data monitoring and analysis, and they are typically created for a particular use case.

- Responsive and Design of Dashboard

Considering all visualizations Dashboard is created.

I have created 4 'Tabs' in dashboard



Student Dashboard    Online\_Education\_System\_review

IBM Cognos Analytics | Online\_Educa ...iew\_dashboard

Tab 1 Tab 2 Tab 3 Tab 4

Economic status, Home Location and Performance in online

Economic status	Home Location	Performance ..
Middle Class	Rural	6
	Urban	6
<b>Summary</b>		6
Poor	Rural	6
	Urban	6
<b>Summary</b>		6

Time spent on social media (Hours) by Device type used to attend classes

Device type used to attend classes

- Desktop
- Mobile
- Laptop

Engaged in group studies? colored by Engaged in group studies? sized by Performance in online

Performance In on... Engaged in group studies?

- No
- Yes

81°F Partly sunny

Search

Student Dashboard    Online\_Education\_System\_review

IBM Cognos Analytics | Online\_Educa ...iew\_dashboard

Tab 1 Tab 2 Tab 3 Tab 4

Age(Years) by Device type used to attend classes colored by Level of Education and Gender

Level of Education - Gender

- Post Graduate | Female
- Post Graduate | Male
- Schhool | Female

Device type used to attend classes by Performance in online colored by Gender

Gender

- Female
- Male

Profit by Category colored by Region

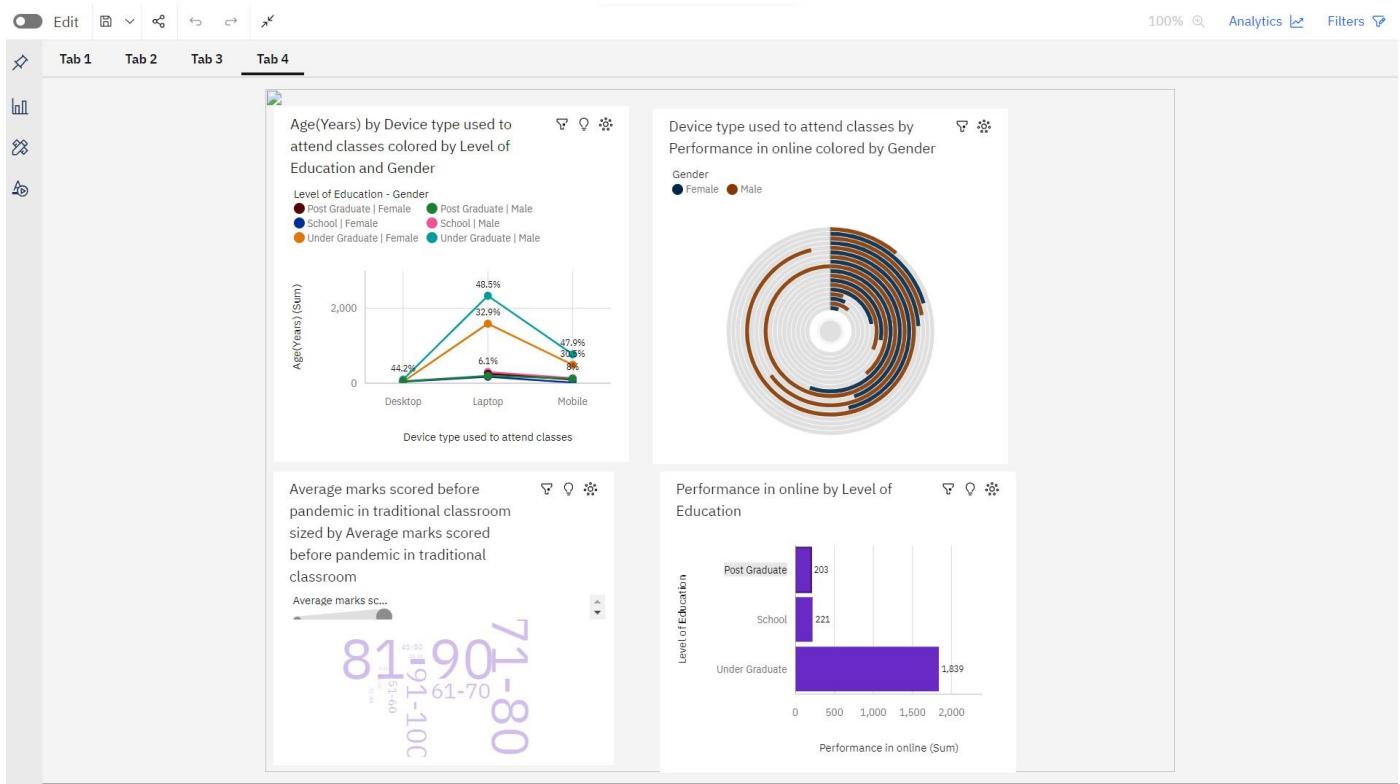
Region

- Central
- East
- South
- West

Time spent on social media (Hours) by Level of Education

Level of Education

Level of Education	Time spent on social media (Hours)
Post Graduate	351
School	247
Under Graduate	2,126



## ➤ Story

In order to make the material more interesting and understandable, facts and analysis are sometimes presented in the form of stories.

- No of Scenes of Story

A storyboard divides the analysis into a number of steps or scenes and serves as a visual depiction of the data analysis process.

4 scenes created as follows:



# Device usage in Online

- Majority of student use Laptop for online classes

Time spent on social media (Hours) by Device type used to attend classes

Device type used to attend classes  
Desktop (Purple) Mobile (Blue) Laptop (Teal)

A pie chart titled "Time spent on social media (Hours) by Device type used to attend classes". The chart is divided into three segments: Laptop (Teal), Mobile (Blue), and Desktop (Purple). The Laptop segment is the largest, followed by Mobile, and then Desktop.

Device Type	Time Spent (Hours)
Laptop	1,746
Mobile	907
Desktop	71

? ⚙️

Prev scene ⏪ ⏩ Next scene Scene 2 of 4 0:05.0 0:05.0 ⏷

Edit Analytics Filters

# Correlation of performance & Economic Status

- Rural students perform better than other

Economic status, Home Location and Performance in online		
Economic status	Home Location	Performance in online
Middle Class	Rural	6.72
	Urban	6.68
<b>Summary</b>		6.69
Poor	Rural	6.49
	Urban	6.07
<b>Summary</b>		6.37
Rich	Rural	9
	Urban	7.11
<b>Summary</b>		7.3
<b>Summary</b>		6.7

Prev scene Next scene Scene 3 of 4 0:04.4 0:10.0 Analytics Filters

Edit Analytics Filters

# Categorization by Gender and Education level

- Usage by gender and Education

Age(Years) by Device type used to attend classes colored by Level of Education and Gender

Level of Education - Gender

- Post Graduate | Female
- Post Graduate | Male
- School | Female
- School | Male
- Under Graduate | Female
- Under Graduate | Male

The graph displays age trends across six categories: Post Graduate Female (pink line), Post Graduate Male (pink line), School Female (dark blue line), School Male (green line), Under Graduate Female (blue line), and Under Graduate Male (red line). All groups show a similar trend: a sharp increase from approximately 10 years old to a peak around 18-20 years old, followed by a gradual decline. Females generally have higher ages than males at each corresponding level.

Prev scene Next scene Scene 4 of 4 0:02.4 0:05.0 Analytics Filters

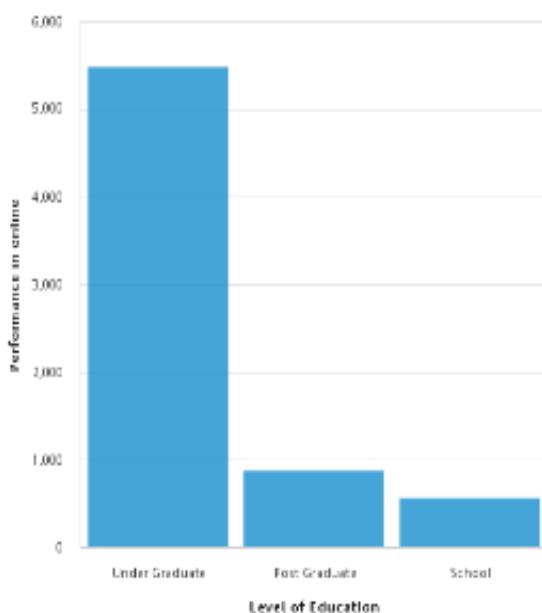
## ➤ Report

Usually based on information from a database or other data source, a report is a document that displays information in a certain structure and layout.

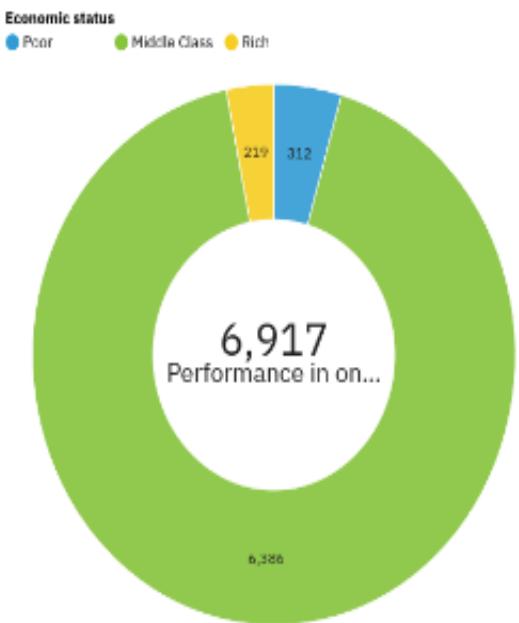
- Creating a report

## Report on Online Education System

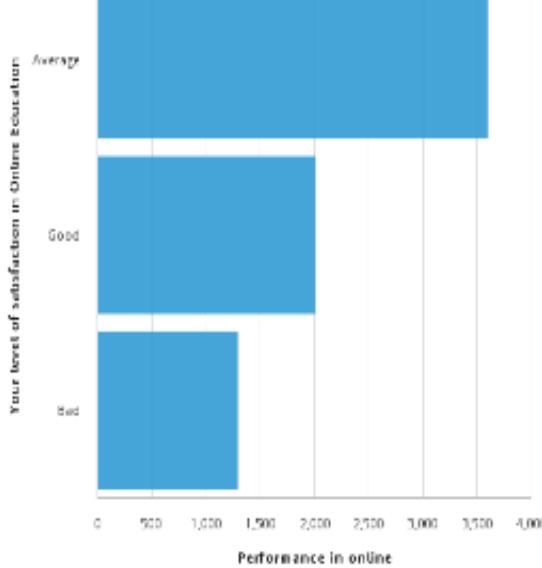
Performance of student with Level of Education



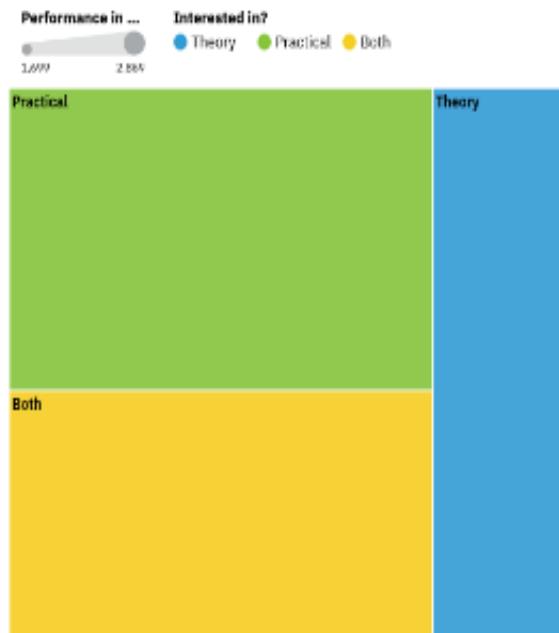
Relation of performance with Economic Status



Social media impact on performance



Performance by Interest or teaching mode



➤ **Performance Testing**

## No Of Calculation Fields

Insertable objects

Find

online\_education

ONLINE EDUCATION SYSTEM REVIEW.csv

- abc Gender
- abc Home Location
- abc Level of Education
- Age(Years)
- Number of Subjects
- abc Device type used to attend classes
- abc Economic status
- Family size
- Internet facility in your locality
- Are you involved in any sports?
- Do elderly people monitor you?
- # Study time (Hours)
- # Sleep time (Hours)
- Time spent on social media (Hours)
- abc Interested in Gaming?

No Of Visualizations/ Graphs

**Visualizations created as follows:**

- Column Chart: Age (Years) by Your level of satisfaction in Online Education
- Bar Chart: Internet facility in your locality by Your level of satisfaction in Online Education
- Bar chart: Performance in online by Level of Education
- Pie Chart: Time spent on social media (Hours) by Device type used to attend classes
- Packed bubbles: Engaged in group studies? colored by Engaged in group studies? sized by Performance in online
- Wordcloud: Average marks scored before pandemic in traditional classroom
- Table: Economic status, Home Location and Performance in online
- Radial Chart: Device type used to attend classes by Performance in online colored by Gender
- Line Chart: Performance in online by study time(hours)
- Line Chart: Performance in online by sleep time(hours)

## ➤ Web Integration

Publishing enables us to share outcomes and progress, as well as to measure and monitor important performance metrics.

The screenshot shows a code editor interface with a dark theme. On the left is the Explorer sidebar showing a project structure with a file named 'app.py' selected. The main area displays the content of 'app.py':

```
from flask import Flask, render_template
app = Flask(__name__)
@app.route("/")
def home():
    return render_template("index.html")
if __name__ == "__main__":
    app.run(debug=False, port=5000)
```

Below the code editor is a terminal window showing a log of HTTP requests:

```
127.0.0.1 - [10/Sep/2023 16:37:34] "GET /static/assets/img/hero-img.png HTTP/1.1" 304 -
127.0.0.1 - [10/Sep/2023 16:37:34] "GET /static/assets/vendor/glightbox/js/glightbox.min.js HTTP/1.1" 304 -
127.0.0.1 - [10/Sep/2023 16:37:34] "GET /static/assets/img/team/team-1.jpg HTTP/1.1" 304 -
127.0.0.1 - [10/Sep/2023 16:37:34] "GET /static/assets/img/team/team-2.jpg HTTP/1.1" 304 -
127.0.0.1 - [10/Sep/2023 16:37:34] "GET /static/assets/img/team/team-3.jpg HTTP/1.1" 304 -
127.0.0.1 - [10/Sep/2023 16:37:34] "GET /static/assets/img/team/team-4.jpg HTTP/1.1" 304 -
127.0.0.1 - [10/Sep/2023 16:37:34] "GET /static/assets/vendor/swiper/swiper-bundle.min.js HTTP/1.1" 304 -
127.0.0.1 - [10/Sep/2023 16:37:34] "GET /static/assets/vendor/remixicon/remixicon.woff2?1fa40e8900654d2863d011707bf6f2 HTTP/1.1" 304 -
127.0.0.1 - [10/Sep/2023 16:37:34] "GET /static/assets/vendor/bootstrap-icons/fonts/bootstrap-icons.woff2?1fa40e8900654d2863d011707bf6f2 HTTP/1.1" 304 -
127.0.0.1 - [10/Sep/2023 16:37:35] "GET /static/assets/vendor/boxicons/fonts/boxicons.woff2 HTTP/1.1" 304 -
127.0.0.1 - [10/Sep/2023 16:37:39] "GET /static/assets/img/favicon.png HTTP/1.1" 304 -
```

The bottom status bar indicates: Ln 11, Col 36, Spaces: 4, UTF-8, CRLF, Python 3.11.3 (base: conda), Port : 5500.

The screenshot shows a web browser window with the URL [127.0.0.1:5500/Resi/templates/index.html](http://127.0.0.1:5500/Resi/templates/index.html). The page title is "Online Education System Review".

The navigation menu includes:

- Home
- Report
- Dashboard
- Story
- Team
- Drop Down
  - Drop Down 1
  - Deep Drop Down
    - Deep Drop Down 1
    - Deep Drop Down 2
    - Deep Drop Down 3
    - Deep Drop Down 4
    - Deep Drop Down 5
  - Drop Down 2
  - Drop Down 3
  - Drop Down 4
- Contact
- Get Started

Below the menu, there is a list of lorem ipsum text:

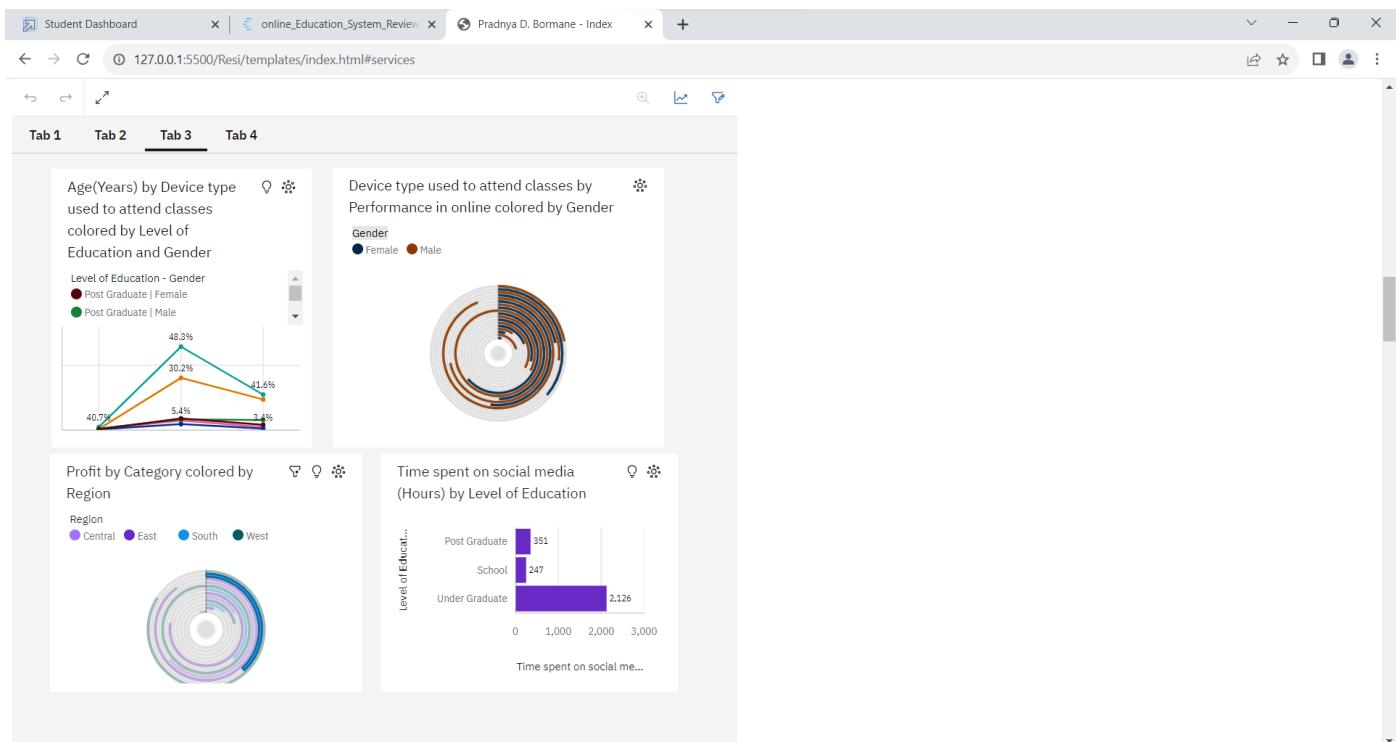
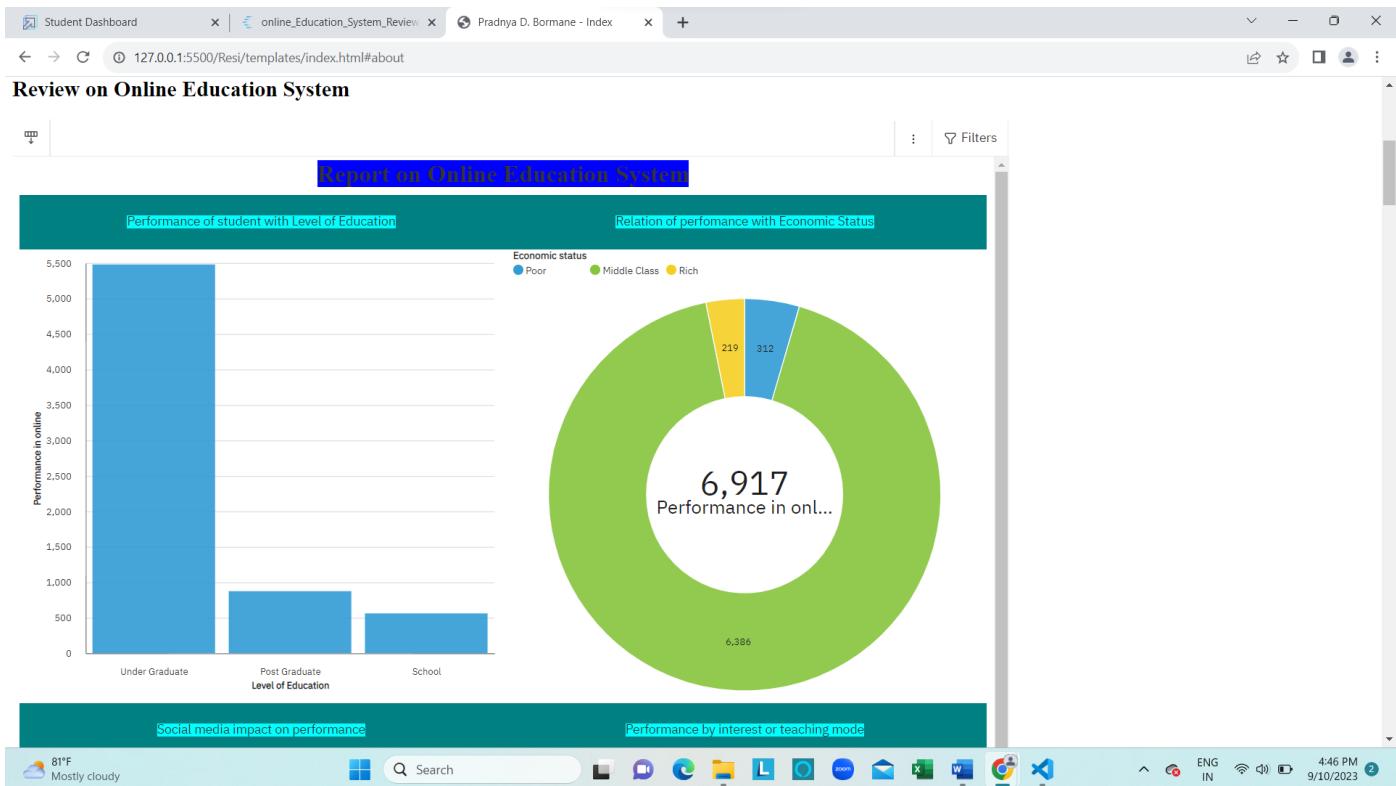
- Dolorem ratione dolorum
- Quo nihil natus ea non pariatur optio occaecati
- Duis aute irure dolor in reprehenderit in

At the bottom of the page are links for "Get Started" and "Request a Quote".

The browser status bar shows: Student Dashboard, online\_Education\_System\_Review, Pradnya D. Bormane - Index, 127.0.0.1:5500/Resi/templates/index.html, Get Started Request a Quote.

The screenshot also shows a report titled "Report on Online Education System" with tabs for "Performance of student with Level of Education" and "Relation of performance with Economic Status".

The system tray at the bottom right shows: 81°F Mostly cloudy, Search, various icons (File Explorer, Mail, etc.), ENG IN, 4:45 PM, 9/10/2023.



The screenshot shows a presentation slide with the title "Correlation of performance & Economic Status". On the left, there is a sidebar containing a bullet point: "• Rural students perform better than other". The main content area displays a table titled "Economic status, Home Location and Performance in online". The table has three columns: "Economic status", "Home Location", and "Performance in online". The data is organized into three main sections: "Middle Class", "Poor", and "Rich". Each section contains two rows for "Rural" and "Urban" locations, followed by a "Summary" row. The "Performance in online" values are: Middle Class (Rural: 6.72, Urban: 6.68, Summary: 6.69), Poor (Rural: 6.49, Urban: 6.07, Summary: 6.37), and Rich (Rural: 9, Urban: 7.11). The table includes a dropdown arrow icon at the top right.

Economic status	Home Location	Performance in online
Middle Class	Rural	6.72
	Urban	6.68
Summary		6.69
Poor	Rural	6.49
	Urban	6.07
Summary		6.37
Rich	Rural	9
	Urban	7.11

Below the table, there is a navigation bar with icons for "Prev scene", "Next scene", and a play/pause button. The text "Scene 3 of 4" is displayed next to the play/pause button. A progress bar indicates the video is at 0:02.9 of a total duration of 0:10.0.

## Conclusion:

Online education is a revolutionary force influencing the future of education rather than just a crisis-response strategy. We can build a more inclusive, interesting, and productive learning environment in the digital age by tackling the highlighted difficulties and seizing the opportunities.