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

Online classes and technology have emerged as a superhero during the lockdown days. We have all been under house arrest but are still connected with the world of education. Due to the lockdown, students have not been able to stay connected with the outer world and the lack of exposure is evident. The only reprieve for the students' mental well-being has been the transition to online classes. Teachers made sure that the learning for students was not compromised, so they took a great leap forward to find solutions and create new learning environments for their students to ensure that learning never stops. With the rapid advancements in technology and the widespread availability of internet access, online education has gained significant popularity in recent years.

This project aims to delve deep into the various aspects of online education, examining its strengths, weaknesses, opportunities, and challenges. The outcomes of this project will provide valuable insights for educational institutions, policymakers, and online learning platforms to enhance the effectiveness and accessibility of online education. This analysis of the online education system aims to contribute to the ongoing dialogue on the future of education and help shape a more inclusive, engaging, and effective learning environment in the digital age.

Business Requirements

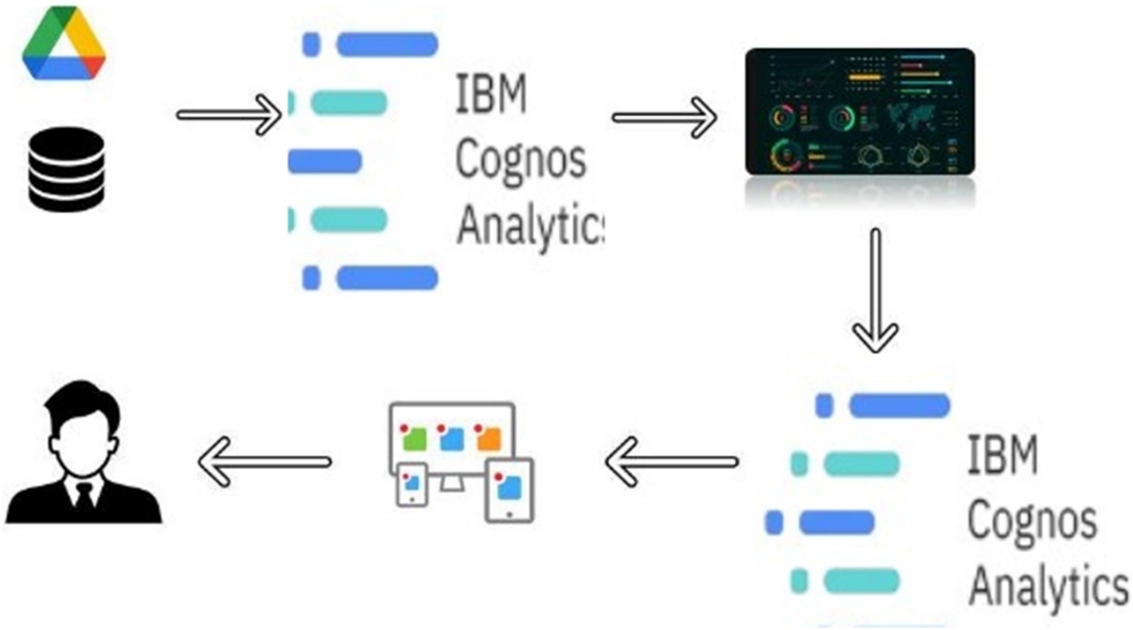
Business requirements for a problem statement like this would include taking student and teacher surveys, understanding student needs , and having an efficient feedback system. There is a need to update the content that is being taught to students based on the feedback .These requirements are necessary to ensure that students are able to find it easy to adjust with online education / e-learning. Specific requirements may vary depending on the student demographic, their needs and their interests

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 ?

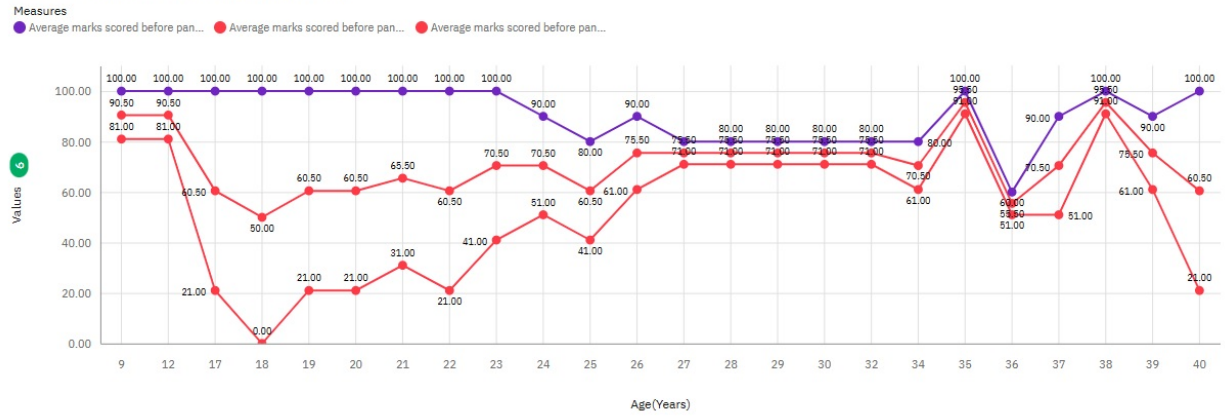
- Interested in ?
- Performance in online
- Your level of satisfaction in online education

Technical Architecture:

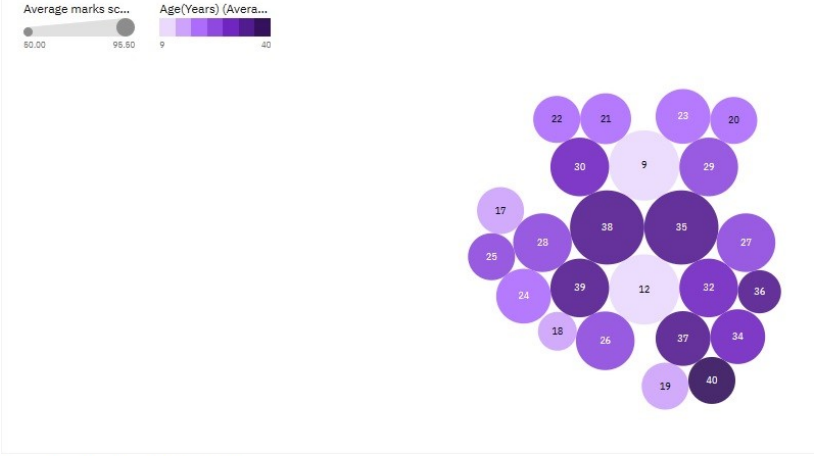


IBM Cognos Analytics and Visualization:

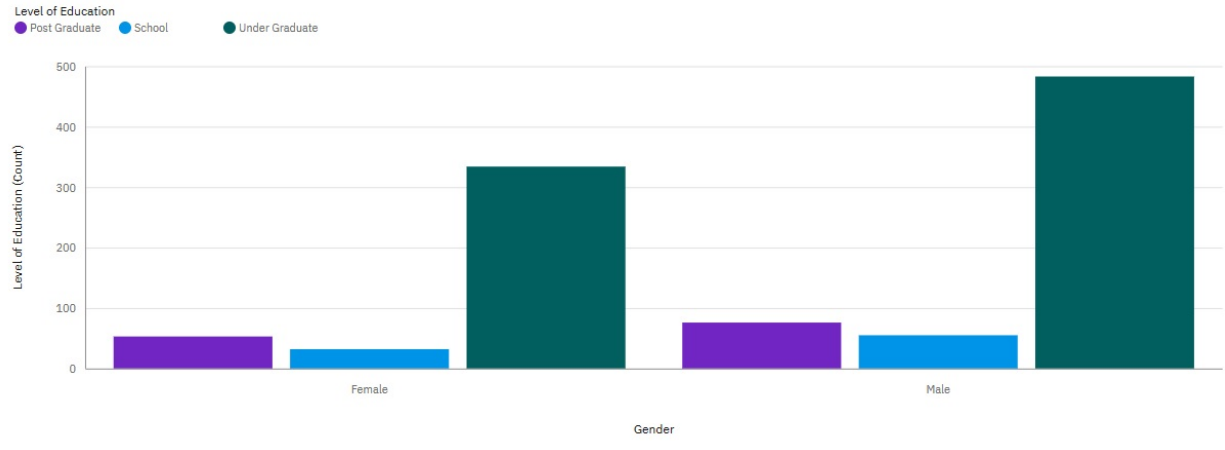
Average marks scored before pandemic in traditional classroom_max, Average marks scored before pandemic in traditional classroom_min and Average marks scored before pandemi by Age(Years)



Age(Years) colored by Age(Years) sized by Average marks scored before pandemi 2

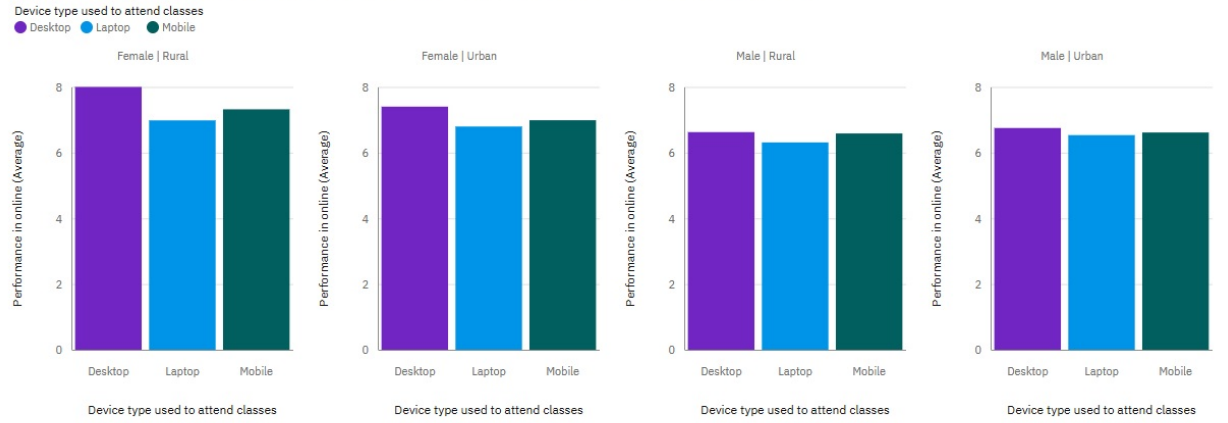


Level of Education by Gender colored by Level of Education

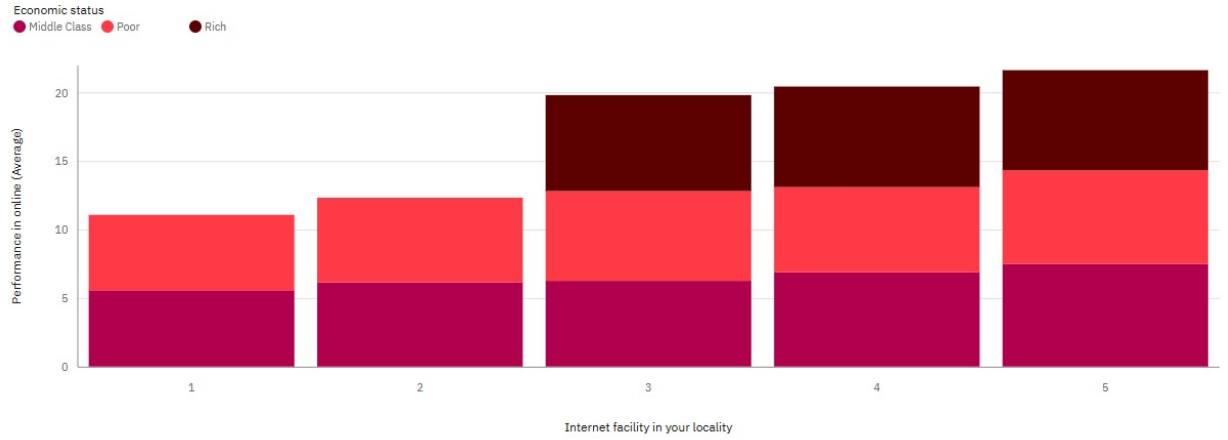


Number of Subjects by Performance in online and Age(Years)

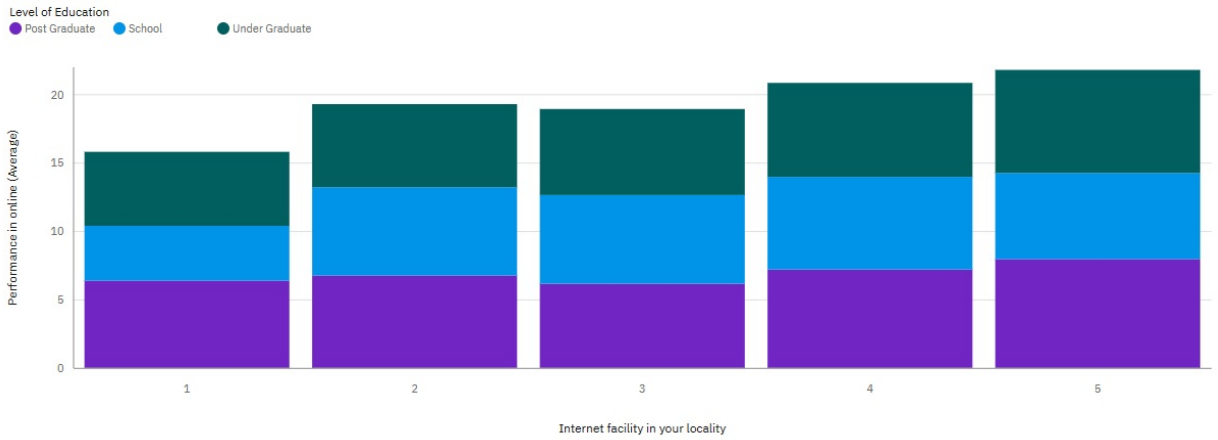
Performance in online by Device type used to attend classes colored by Device type used to attend classes



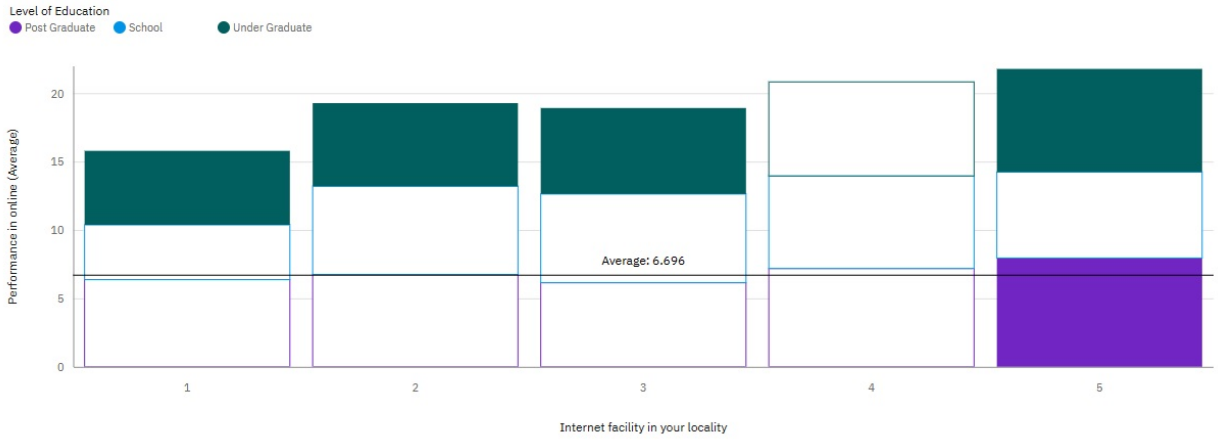
Performance in online by Internet facility in your locality colored by Economic status



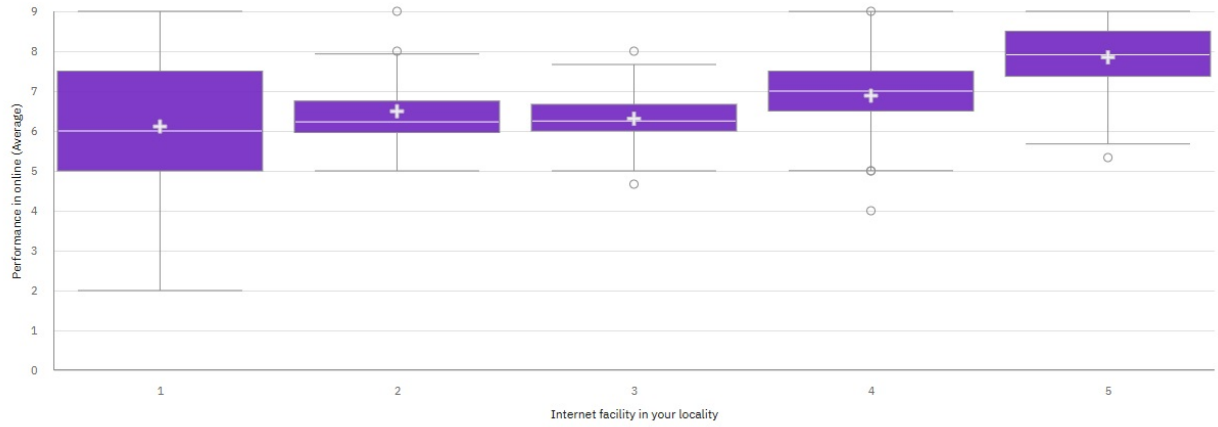
Performance in online by Internet facility in your locality colored by Level of Education

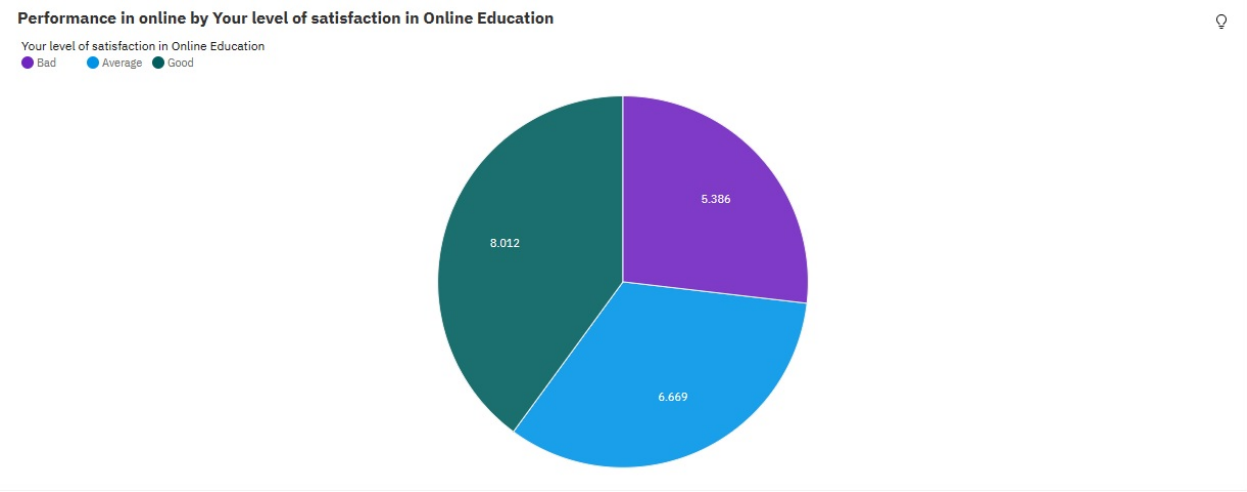


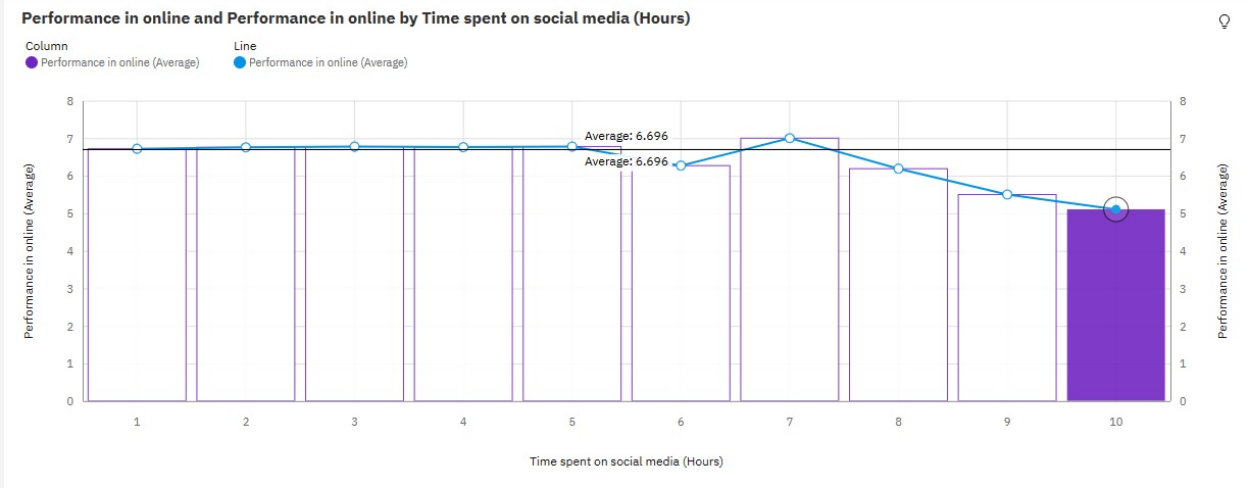
Performance in online by Internet facility in your locality colored by Level of Education



Internet facility in your locality, Performance in online, Number of Subjects







Python/PandasAnalytics and Visualization:

```
<Axes: xlabel='Age(Years)', ylabel='Performance in online'>
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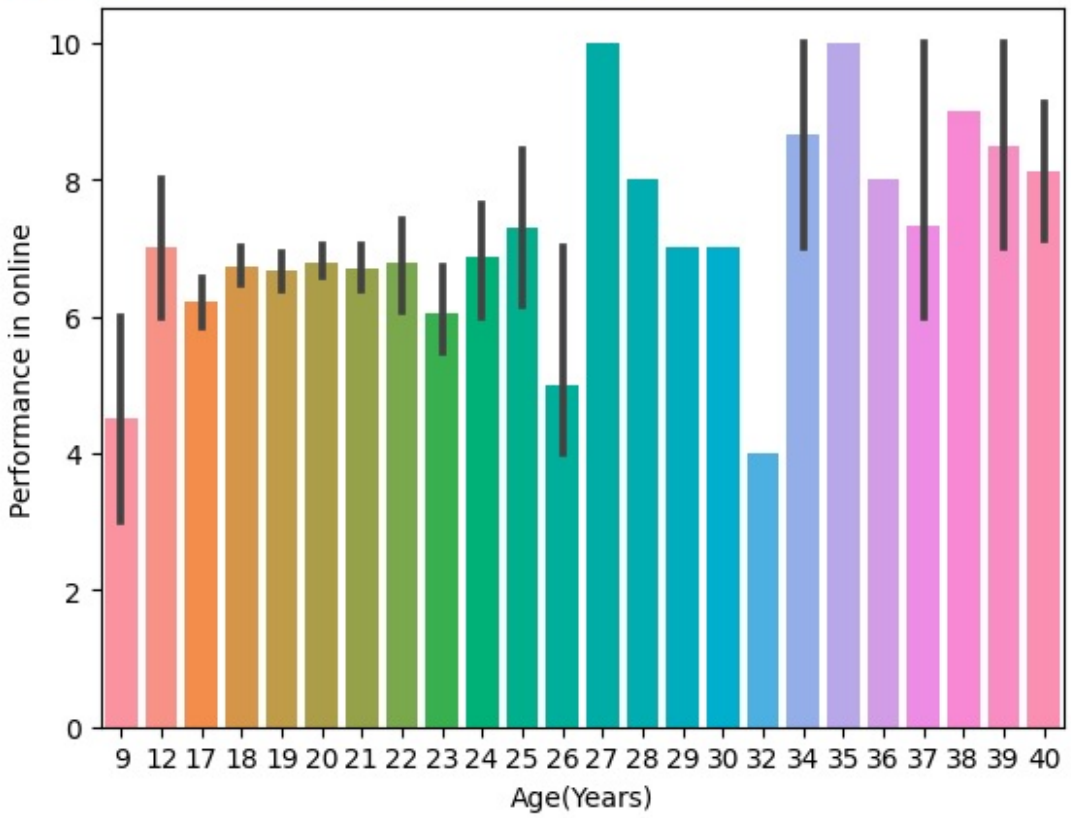


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<Axes: ylabel='Frequency'>]], dtype=object)
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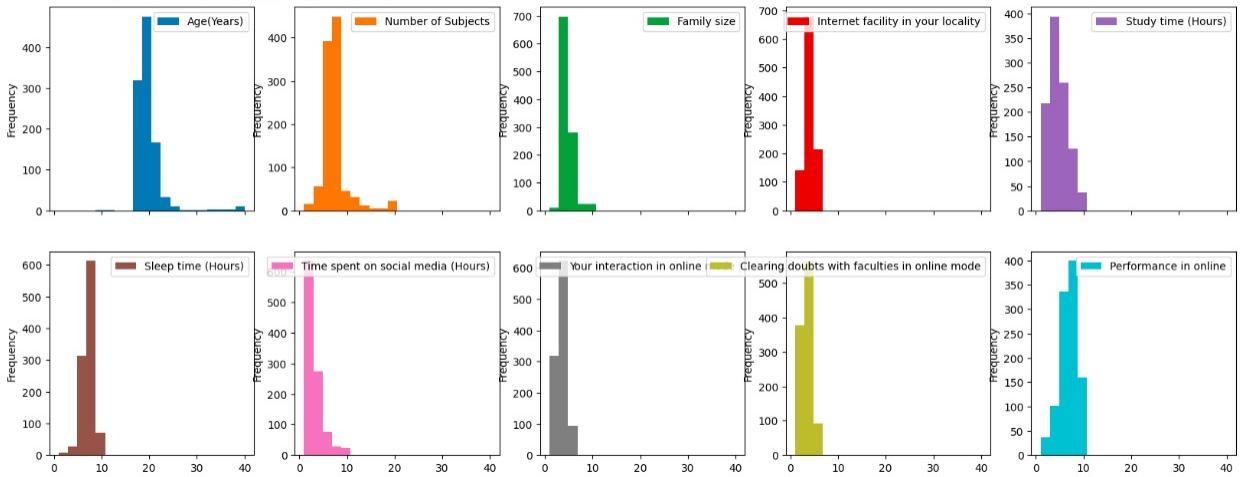
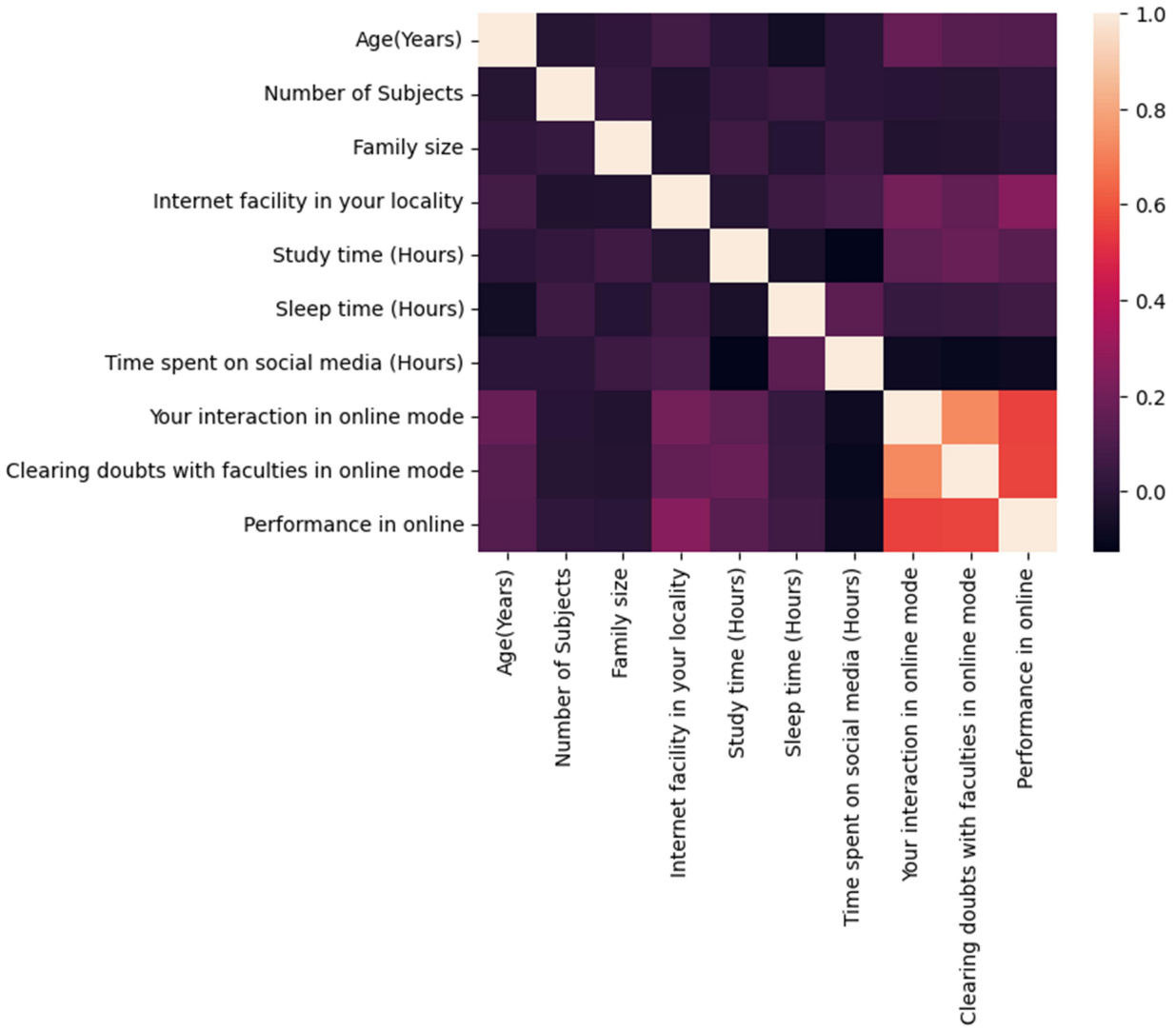
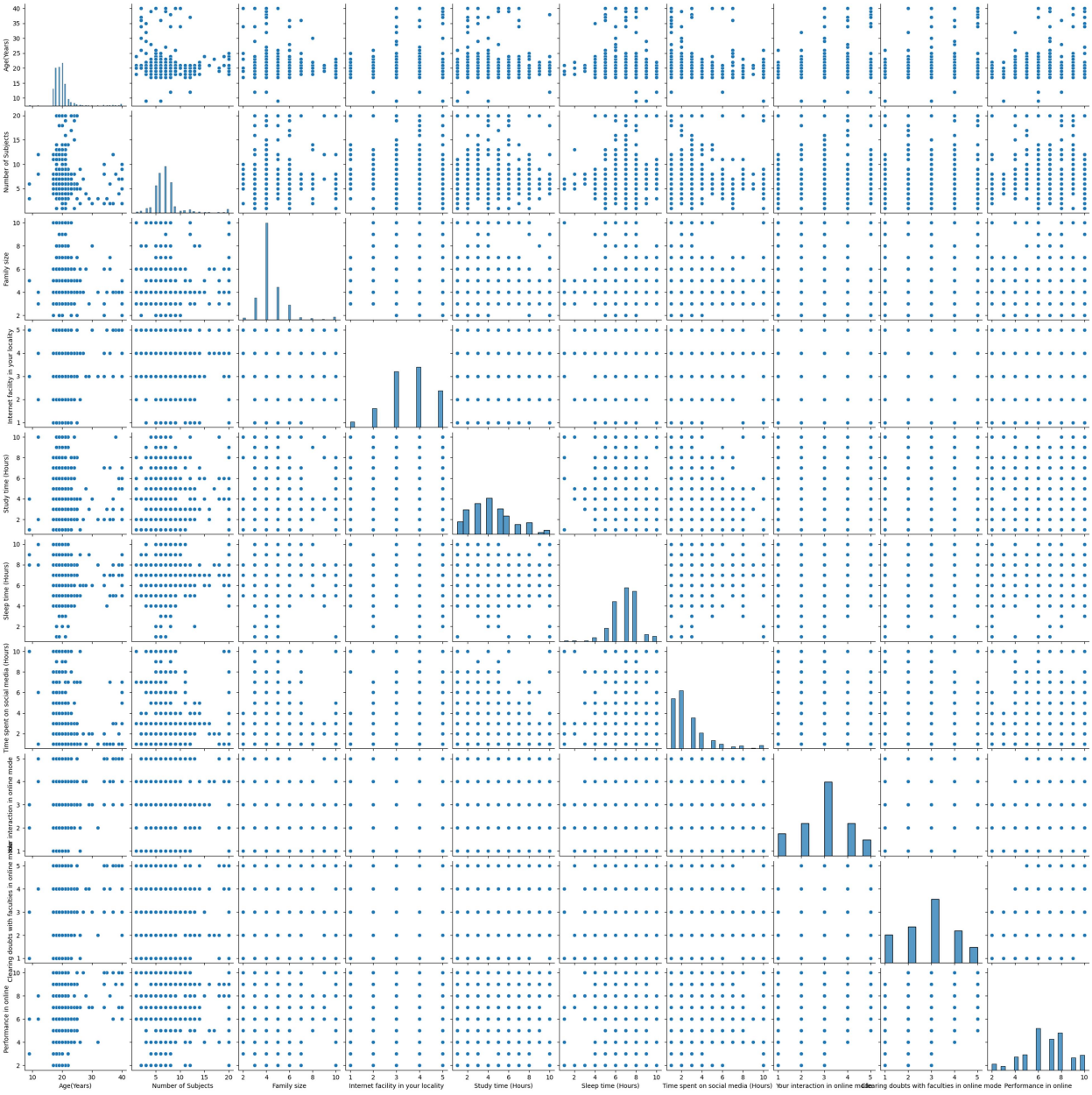



Age(Years)
Number of Subjects
Family size
Internet facility in your locality
Study time (Hours)
Sleep time (Hours)
Time spent on social media (Hours)
Your interaction in online mode
Clearing doubts with faculties in online mode
Performance in online
1.0
0.8
0.6
0.4
0.2
0.0


Age(Years)
Number of Subjects
Family size
Internet facility in your locality
Study time (Hours)
Sleep time (Hours)
Time spent on social media (Hours)
Your interaction in online mode
Clearing doubts with faculties in online mode
Performance in online

Project Flow :

I have to complete all the activities listed below,

- Define Problem / Problem Understanding
  - Specify the business problem
  - Business requirements
  - Literature Survey
  - Social or Business Impact.
- Data Collection
  - Collect the dataset
  - Connect data with IBM cognos
- Data Preparation
  - Prepare the Data for Visualization
- Data Visualizations
  - No of Unique Visualizations
- Dashboard
  - Responsive and Design of Dashboard
- Story
  - No of Scenes of Story
- Report
  - Creating a report
- Performance Testing
  - Amount of Data Rendered to DB ‘
  - Utilization of Data Filters
  - No of Calculation Fields
  - No of Visualizations/ Graphs
- Web Integration
  - Dashboard and Story embed with UI With Flask
- Project Demonstration & Documentation
  - Record explanation Video for project end to end solution
  - Project Documentation-Step by step project development procedure

Literature Survey

Abid Haleem, Mohd Javaid, Mohd Asim Qadri, Rajiv Suman,

Understanding the role of digital technologies in education: A review,

Sustainable Operations and Computers,

Volume 3,

2022,

Pages 275-285,

ISSN 2666-4127,

https://doi.org/10.1016/j.susoc.2022.05.004.

(https://www.sciencedirect.com/science/article/pii/S2666412722000137)

Abstract: One of the fundamental components of the United Nations' sustainable development 2030 agenda is quality education. It aims to ensure inclusive and equitable quality education for all. Digital technologies have emerged as an essential tool to achieve this goal. These technologies are simple to detect emissions sources, prevent additional damage through improved energy efficiency and lower-carbon alternatives to fossil fuels, and even remove surplus greenhouse gases from the environment. Digital technologies strive to decrease or eliminate pollution and waste while increasing production and efficiency. These technologies have shown a powerful impact on the education system. The recent COVID-19 Pandemic has further institutionalised the applications of digital technologies in education. These digital technologies have made a paradigm shift in the entire education system. It is not only a knowledge provider but also a co-creator of information, a mentor, and an assessor. Technological improvements in education have made life easier for students. Instead of using pen and paper, students nowadays use various software and tools to create presentations and projects. When compared to a stack of notebooks, an iPad is relatively light. When opposed to a weighty book, surfing an E-book is easier. These methods aid in increasing interest in research. This paper is brief about the need for digital technologies in education and discusses major applications and challenges in education.

Keywords: Digital technologies; Digital classroom; Education; Students; Teaching

Impact of online classes on the satisfaction and performance of students during the pandemic period of COVID 19

- Ram Gopal,
- Varsha Singh &
- Arun Aggarwal

Education and Information Technologies **volume 26**, pages6923–6947 (2021)

Abstract

The aim of the study is to identify the factors affecting students' satisfaction and performance regarding online classes during the pandemic period of COVID–19 and to establish the relationship between these variables. The study is quantitative in nature, and the data were collected from 544 respondents through online survey who were studying the business management (B.B.A or M.B.A) or hotel management courses in Indian universities. Structural

equation modeling was used to analyze the proposed hypotheses. The results show that four independent factors used in the study viz. quality of instructor, course design, prompt feedback, and expectation of students positively impact students' satisfaction and further student's satisfaction positively impact students' performance. For educational management, these four factors are essential to have a high level of satisfaction and performance for online courses. This study is being conducted during the epidemic period of COVID- 19 to check the effect of online teaching on students' performance.

Coman, C.; Țîru, L.G.; Meseșan-Schmitz, L.; Stanciu, C.; Bularca, M.C. Online Teaching and Learning in Higher Education during the Coronavirus Pandemic: Students' Perspective. *Sustainability* **2020**, *12*, 10367. https://doi.org/10.3390/su122410367

Abstract

The research focuses on identifying the way in which Romanian universities managed to provide knowledge during the Coronavirus pandemic, when, in a very short time, universities had to adapt the educational process for exclusively online teaching and learning. In this regard, we analyzed students' perception regarding online learning, their capacity to assimilate information, and the use of E-learning platforms. An online survey based on a semi-structured questionnaire was conducted. Data was collected from 762 students from two of the largest Romanian universities. The results of the research revealed that higher education institutions in Romania were not prepared for exclusively online learning. Thus, the advantages of online learning identified in other studies seem to diminish in value, while disadvantages become more prominent. The hierarchy of problems that arise in online learning changes in the context of the crisis caused by the pandemic. Technical issues are the most important, followed by teachers' lack of technical skills and their teaching style improperly adapted to the online environment. However, the last place was assigned by students to the lack of interaction with teachers or poor communication with them. Based on these findings, research implications for universities and researchers are discussed.

Keywords:

online teaching; E-learning platform; higher education; students' preferences; online information assimilation

Shailendra Palvia, Prageet Aeron, Parul Gupta, Diptiranjan Mahapatra, Ratri Parida, Rebecca Rosner & Sumita Sindhi (2018) Online Education: Worldwide Status, Challenges, Trends, and Implications, Journal of Global Information Technology Management, 21:4, 233-241, DOI: 10.1080/1097198X.2018.1542262

Online education in its various modes has been growing steadily worldwide due to the confluence of new technologies, global adoption of the Internet, and intensifying demand for a workforce trained periodically for the ever-evolving digital economy. Online education is on track to become mainstream by 2025. This editorial documents country-level factors that impact quantity and quality of online education. Such factors include industry (business); governments

at local, state, and federal levels; country laws; ICT capacity; Internet/mobile technology diffusion; and income and digital divide. We provide implications for country and world organizations concerning online education.