

# Project Report

IBM Built-A-Thon 2023

## IBM Cognos Analytics

### Unveiling the virtual Classroom: An In-depth Analysis of the Online Education System.

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#### **Introduction:**

Due to the rise in popularity of collaborative learning and developments in computer-mediated communication (CMC), online education has become more popular. The old behaviorist method, which conforms to objectivism and the idea that there is a single, unchanging reality and absolute knowledge, is being replaced by collaborative learning.

#### **Objectives:**

Education system is conducted with online and offline in two modes. Online classes were very much needed during the pandemic. In this project a deep analysis of the online education system is done. The different attributes such as a number of members in the family, no. of subjects to be attended, internet speed, location, age, gender are considered and in-depth analysis is done. Online education varies depending on the student demographic, internet facility in the locality. Effectiveness of the class to know whether the elderly persons are monitoring. Economic status of the family is also considered.

Objectives for conducting an in-depth analysis of the online education system:

**Evaluate Learning Outcomes:** Assess the effectiveness of online education in achieving learning objectives and outcomes for various subjects and age groups.

**Assess Accessibility:** Analyze the accessibility of online education to a diverse population, including individuals with disabilities and those from underserved communities.

**Analyze Pedagogical Approaches:** Examine different pedagogical methods employed in online education, such as synchronous vs. asynchronous learning, and their impact on student

engagement and retention.

**Technology Infrastructure Assessment:** Evaluate the technical infrastructure, including hardware, software, and internet connectivity, required for effective online learning.

**Cost-Benefit Analysis:** Conduct a cost-benefit analysis to determine the financial implications of online education compared to traditional classroom settings.

**Identify Challenges and Solutions:** Identify common challenges faced by educators and students in the online education system and propose practical solutions.

**Teacher Training and Support:** Investigate the training and support provided to educators to facilitate a smooth transition to online teaching.

### **Some of the advantages of Online Education**

**Flexibility:** Online education allows students to learn at their own pace and on their own schedule. This flexibility is especially beneficial for working adults, parents, and individuals with busy lifestyles, as it enables them to balance their education with other responsibilities.

**Accessibility:** Online education makes learning accessible to a wider audience, including individuals who may have geographical, physical, or other constraints that limit their access to traditional brick-and-mortar institutions.

**Variety of Courses:** Online platforms offer a wide range of courses and programs, allowing students to explore diverse subjects and fields of interest, including niche topics that may not be available locally.

**Cost-Effective:** Online education can be more cost-effective than traditional in-person education. Students can save on commuting, housing, and textbook expenses, and many online courses are more affordable than their on-campus counterparts.

**Self-Paced Learning:** Online courses often offer self-paced learning options, enabling students to progress through the material at a speed that suits their individual learning style and comprehension.

**Personalized Learning:** Some online platforms use adaptive technology to tailor the learning experience to each student's abilities and needs, providing personalized recommendations and feedback.

### **Limitations of Online Education**

**Lack of Face-to-Face Interaction:** Online learning lacks the in-person social interaction that traditional classrooms offer. This can lead to feelings of isolation and a lack of engagement with peers and instructors.

**Technical Issues:** Students may encounter technical problems such as internet connectivity issues, software glitches, or hardware malfunctions, which can disrupt their learning experience.

**Self-Motivation Required:** Online learning demands a high level of self-discipline and motivation. Students must manage their time effectively and stay motivated to keep up with coursework.

**Limited Hands-On Experience:** Some subjects, especially those requiring hands-on skills or laboratory work, may be challenging to teach effectively in an online format.

**Limited Access to Resources:** Online students may have limited access to physical libraries, labs, and resources compared to their on-campus counterparts.

## **Literature Review**

### **Historical Development of Online Education**

- Trace the historical evolution of online education systems.
- Highlight key milestones and developments in the field.
- Discuss how online education has evolved over time.

### **Online Education Pedagogy and Models**

- Explore different pedagogical approaches used in online education.
- Discuss models of online learning, such as blended learning, synchronous vs. asynchronous learning, and MOOCs (Massive Open Online Courses).
- Analyze the effectiveness of these pedagogical approaches.

### **Technological Infrastructure and Tools**

- Describe the technological tools and platforms commonly used in online education.
- Discuss the role of Learning Management Systems (LMS), video conferencing software, and other technologies.
- Examine the impact of technology on the online learning experience.

### **Student Engagement and Motivation**

- Investigate strategies for enhancing student engagement in online courses.
- Explore factors that influence student motivation and persistence in online learning.
- Discuss the role of social interaction and peer collaboration in online education.

### **Assessment and Evaluation**

- Analyze methods of assessment and evaluation in online education.
- Discuss the challenges of assessing online learners and ensuring academic integrity.
- Highlight innovative assessment practices in online courses.

### **Accessibility and Inclusivity**

- Explore issues related to the accessibility of online education for diverse populations.
- Discuss strategies for making online courses more inclusive for individuals with disabilities.
- Address the digital divide and efforts to bridge the gap.

### **Quality Assurance and Accreditation**

- Examine quality assurance mechanisms for online education programs and courses.

- Discuss the accreditation of online institutions and programs.
- Analyze the role of standards and guidelines in ensuring quality.

### **Effectiveness and Learning Outcomes**

- Review studies that assess the effectiveness of online education in terms of learning outcomes.
- Compare the academic achievements of online learners with those in traditional settings.
- Discuss factors that influence the success of online students.

### **Challenges and Barriers**

- Identify common challenges and barriers in online education, such as technological issues, lack of motivation, and digital literacy gaps.
- Discuss strategies and solutions for overcoming these challenges.

### **Future Trends and Directions**

- Explore emerging trends in online education, such as AI-driven personalized learning and virtual reality in education.
- Discuss the potential future directions and innovations in the field.

### **Software and Hardware requirements**

#### **Software Requirements**

**Operating System: Windows**

**IBM Cognos software**

#### **Hardware Requirements**

**System: Pentium IV**

**Dataset**

**The dataset used is Online education Review from kaggle website**

## Data Visualizations

Different visualization were created based n the data set taken from kaggle

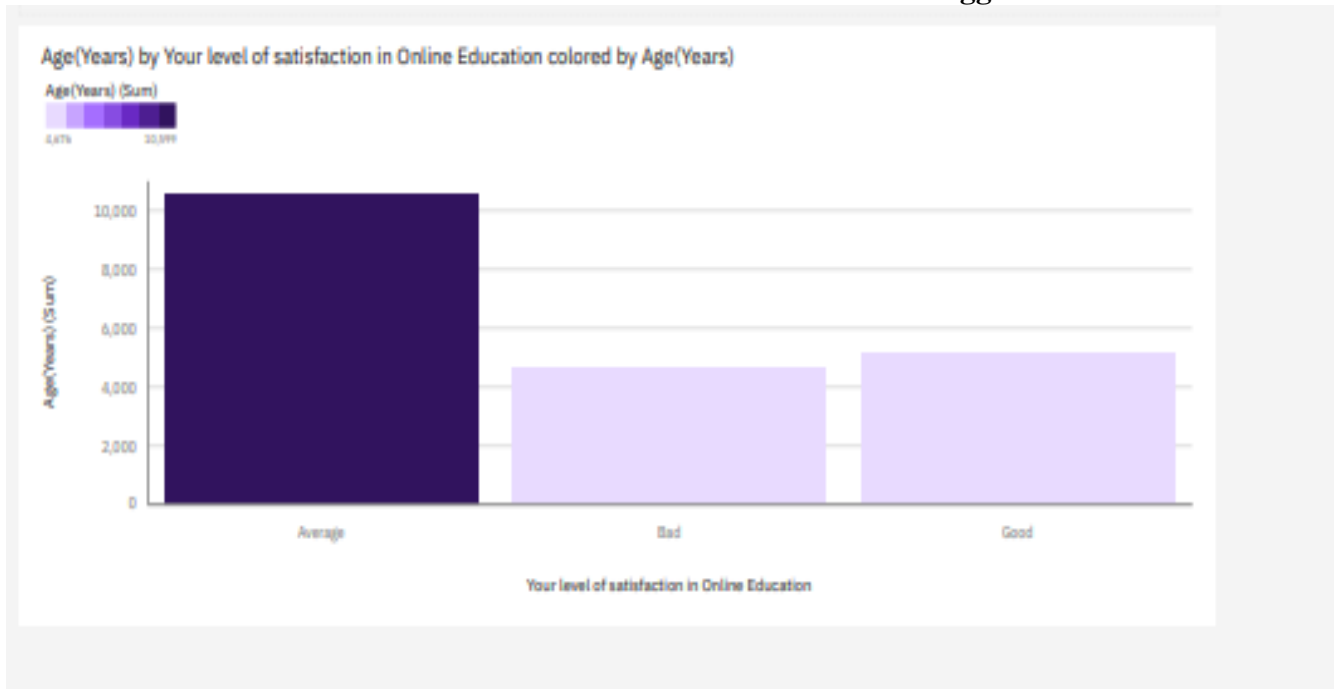


Fig.1

In the above fig.1 the level of satisfaction is average for higher age groups and it is bad for lower age groups.

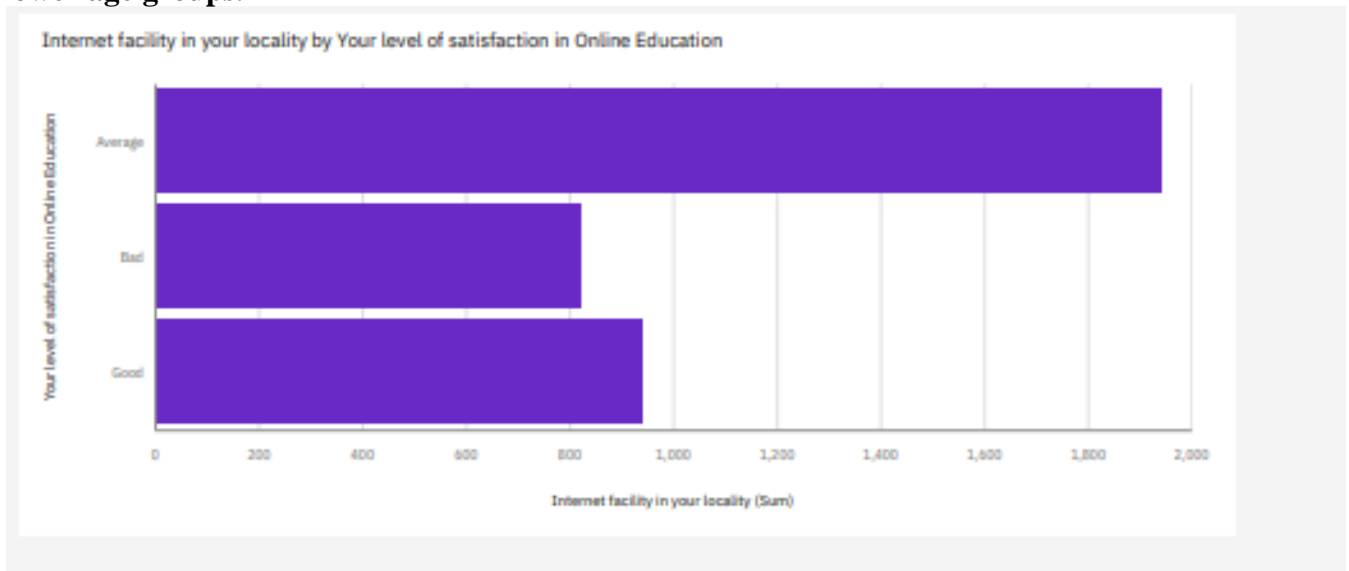
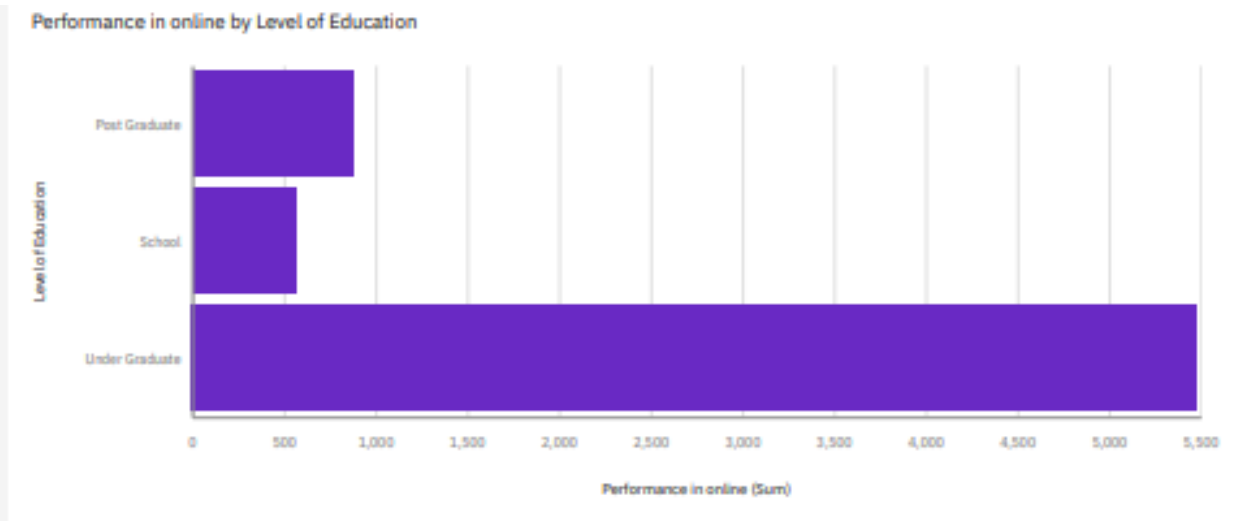


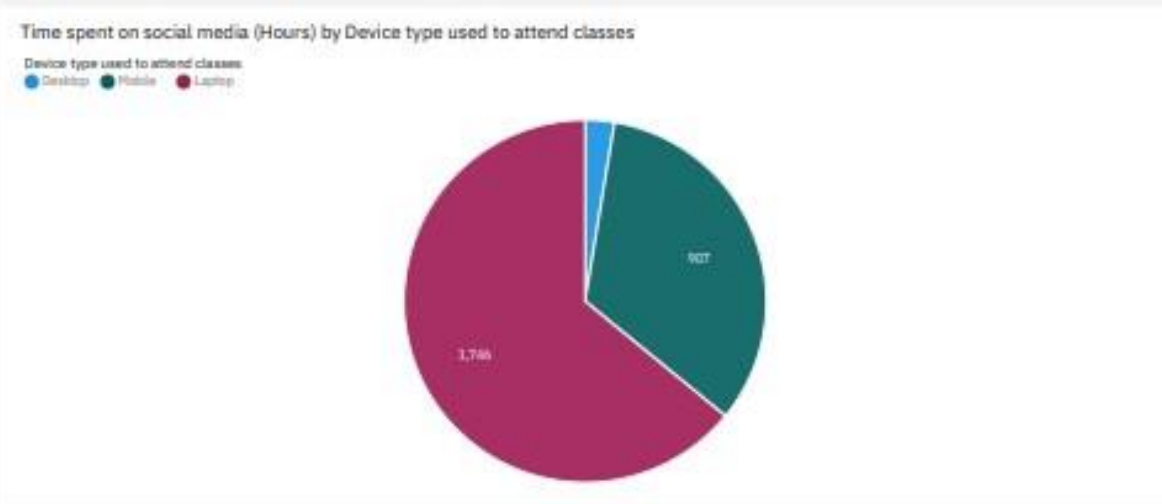
Fig.2

Figure 2 depicts as the level of internet increases the level of satisfaction is average. If the internet in the locality is not good the level of satisfaction of online education is bad.



**Fig.3**

**Figure 3 shows the performance of online education is good for under graduate student. Performance of online education in school is not good.**



**Fig.4**

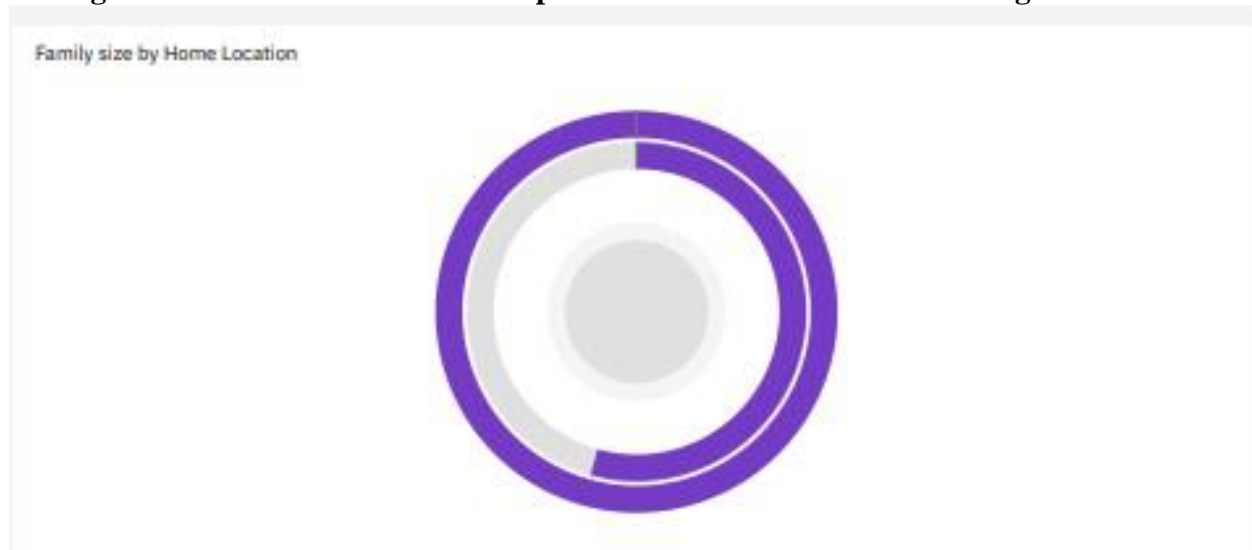
**Time spent on social media is more when students use laptops then compared with mobiles. Since they can minimize the screen, and can be used anywhere.**



Economic status, Home Location and Performance in online		
Economic status	Home Location	Performance in online
Middle Class	Rural	2,124
	Urban	4,262
Summary		6,386
Poor	Rural	227
	Urban	85
Summary		312
Rich	Rural	27
	Urban	192
Summary		219
Summary		6,917

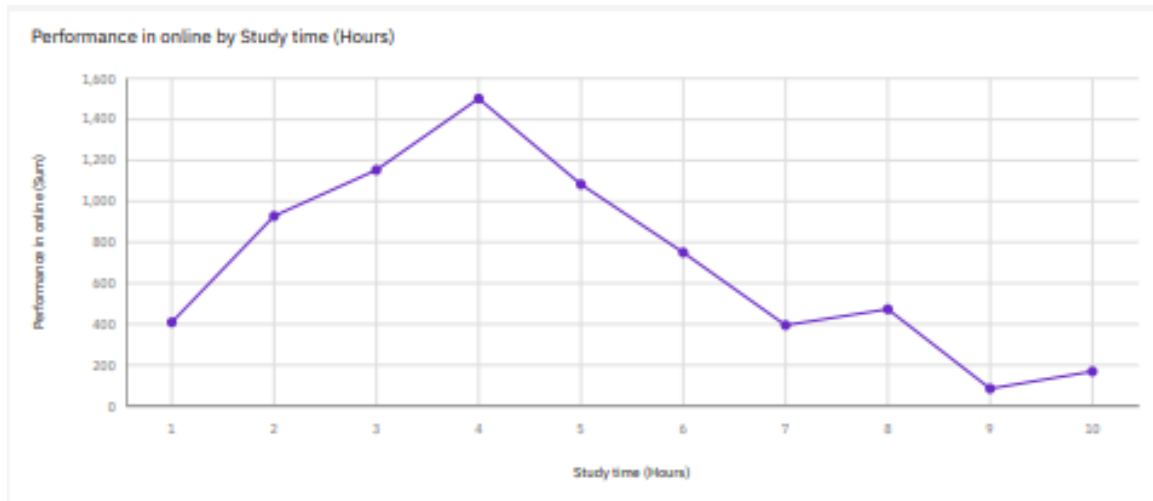
**Fig.7**

The figure 7 shows middle class status performance in online course is highest.



**Fig 8**





**Fig 9**

**Less the study hours better is the performance in online education .**



**Fig.10**

**This Fig.10 shows as the sleeping hours is less performance in online studies is no good .**

### **Conclusions**

Level of satisfaction of online education is good for higher age groups that is undergraduate. If the internet facility is good then the level of satisfaction is average. Less the study hours, better is the performance in online education since it is noticed that, since the time spent on social media is more, when the study time is more. Performance of online education is good in middle class families compared to rich & poor.

### **References**

1. Hsu, Carol, and James Backhouse. "The implementation of online education on campus." *AMCIS 2001 Proceedings* (2001):

