

# **Unveiling The Virtual Classroom an In-Depth Analysis of The Online Education System**

## **1 INTRODUCTION**

### **1.1 Overview**

The pandemic has brought about changes that previously seemed far off in the future. The “new normal,” as we’ve dubbed it, is a world we’d only glimpsed or read about in bits and pieces in science fiction books and movies. We never anticipated, however, that we would see something comparable to those fictitious scenarios in real life. If we were to list all the changes that have occurred in people’s daily lives, the list would be endless, but one important shift that we can all notice is in the education sector. The entire global education system has been turned upside down. This change was not modest, and it lasted for more than a year. Students may even feel a little strange if they return to the classroom because it has become so remote. This is still true in many places of the world today. Most of the today’s learning takes place online, or through screens, with the aid of technological platforms.

While most individuals (students and their parents) have adapted to the new online curriculum, others still struggle and prefer the offline curriculum. There is also an ongoing debate behind the scenes among students and parents regarding which of the two educational mediums is better. While there is no perfect solution, the basic reality is that both online and offline courses offer advantages and disadvantages. When compared to one another, they both seem to stand on their own and appear to be the ideal structure for a certain situation. In this blog we will discuss a few major advantages and disadvantages of online and offline education.

### **1.2 Purpose**

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.

## 2 LITERATURE SURVEY

### 2.1 Existing problem

**Time Management:** It is an irrefutable fact that a school day is jam-packed and that students spend the entire day on campus. Even if the students return home in the evening, exhaustion takes its toll, and the remaining time is spent resting. When compared to online schooling, this may appear to be a disadvantage because the online format allows for more time flexibility. Because no time is spent commuting, the time saved can be spent on other activities such as hobby classes. Students can also save a lot of energy in online classes compared to offline classes and put it to better use.

**Extra Resources:** Offline education necessitates a completely different type of curriculum that goes beyond textbooks and reading. This implies more resources are spent, which can be a drawback when compared to online education, where you only must spend money on the internet and gadgets aside from the fixed costs.

**No Recordings of Classes:** To this day, it is almost unusual to be able to capture an ongoing lesson. So, in an offline education context, you'd be lucky to acquire recorded recordings of the sessions you attended; instead, you'd have to make do with the notes you took during class. With contrast, it is the opposite in online education.

### 2.2 Proposed solution

Online classes offer more flexibility, convenience, and access to learning resources than offline classes.

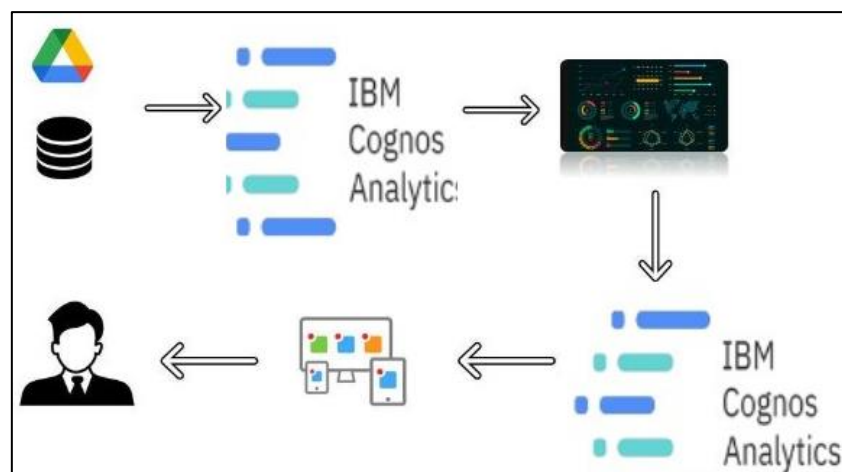
- **Flexible:** Online classes allow students to be more flexible with their schedules because they can attend classes from the comfort of their own homes. They can divide their time and plan their daily schedule accordingly. This flexibility also allows them to learn about other things that interest them; they can take online lessons or enrol in other courses. As a result, they expand their knowledge as well as their personality. Aside from that, they can even spend the rest of their time developing their offline hobbies.

- **Ease of Access:** Online education is easily available everywhere and at any time if one has a reliable internet connection. In contrast to offline lectures where you only attend once and take notes, students can record online classes and sessions for future reference.
- **Affordable:** In comparison to offline school, where fees range from transportation to uniforms, extracurriculars, and a variety of other things, the whole education cost in online education is deducted fairly. Apart from the fixed costs, the only costs are the internet connection and devices, both of which are widely available in most families today.
- **Comfortable and convenient:** Because of the reasons stated above, online education is far more convenient than traditional education. Even when it comes to attending classes, students feel more at ease in online classes. The medium as a whole not only saves time but also resources for students and teachers.

The proposed system aims to utilize IBM Cognos Analytics' robust capabilities to revolutionize education through comprehensive data analysis and visualization tools. Integration of this platform enables institutions to gain insights into student performance, course efficacy, and learning outcomes. Interactive dashboards, predictive analytics, and adaptive learning features empower educators and administrators to make informed decisions, optimize resource allocation, and personalize learning. This data-driven approach enhances education quality and encourages continuous improvement, fostering an effective and engaging learning environment.

### 3 THEORITICAL ANALYSIS

#### 3.1 Block diagram



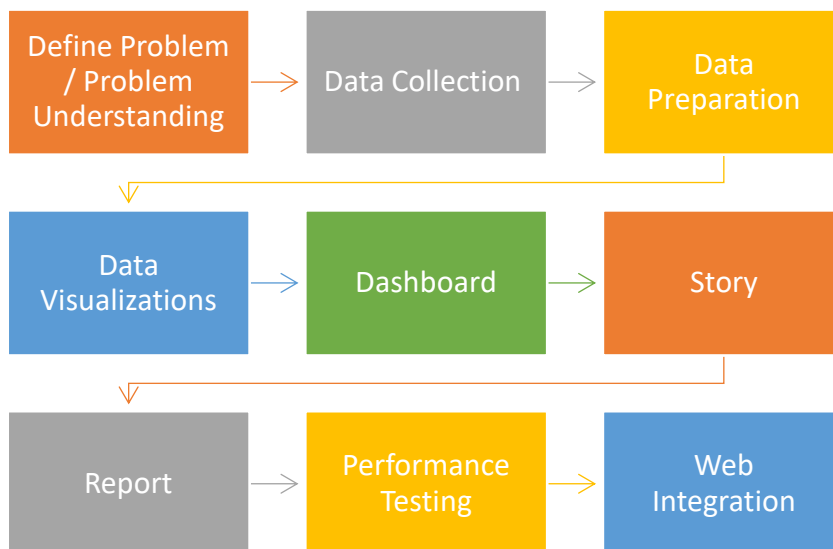
### 3.2 Hardware / Software Designing

- IBM Cloud
- IBM Cognos
- Visual Studio Code

## 4 EXPERIMENTAL INVESTIGATIONS

The experimental investigations yield actionable insights into the potential impact of IBM Cognos Analytics on online education. By analysing student performance, predicting areas of concern, and tailoring learning experiences, the project aims to enhance the overall quality of online education. The use of interactive dashboards and storytelling techniques ensures that the findings are effectively communicated to educators, administrators, and policymakers, facilitating evidence-based decision making. By harnessing the capabilities of IBM Cognos Analytics, this project aims to contribute to the ongoing dialogue on educational innovation and cultivate a more dynamic and effective learning environment in the digital age.

## 5 FLOWCHART



## 6 RESULTS

### Online Education Dashboard

## ONLINE EDUCATION SYSTEM

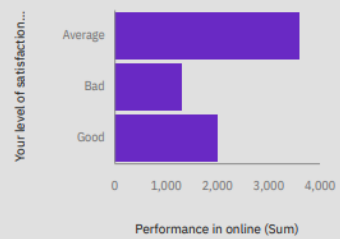
Age(Years) by Your level of satisfaction in Online Education



Internet facility in your locality by Your level of satisfaction in Online Education



Performance in online by Your level of satisfaction in Online Education

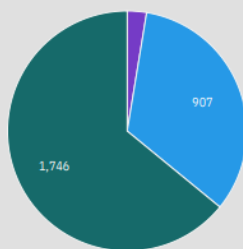


## ONLINE EDUCATION SYSTEM

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? sized by Performance in online

Performance in on...

2,899

4,018



Home Location by Level of Education colored by Home Location

Home Location

Rural Urban



## ONLINE EDUCATION SYSTEM

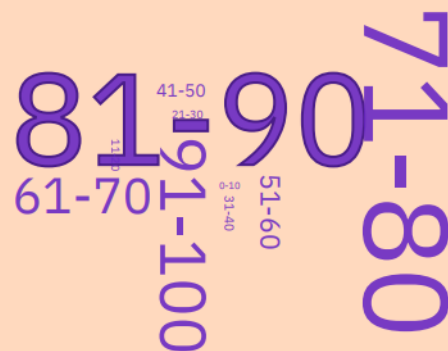
Economic status, Home Location and Performance in online

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
Summary		7.3
Summary		6.7

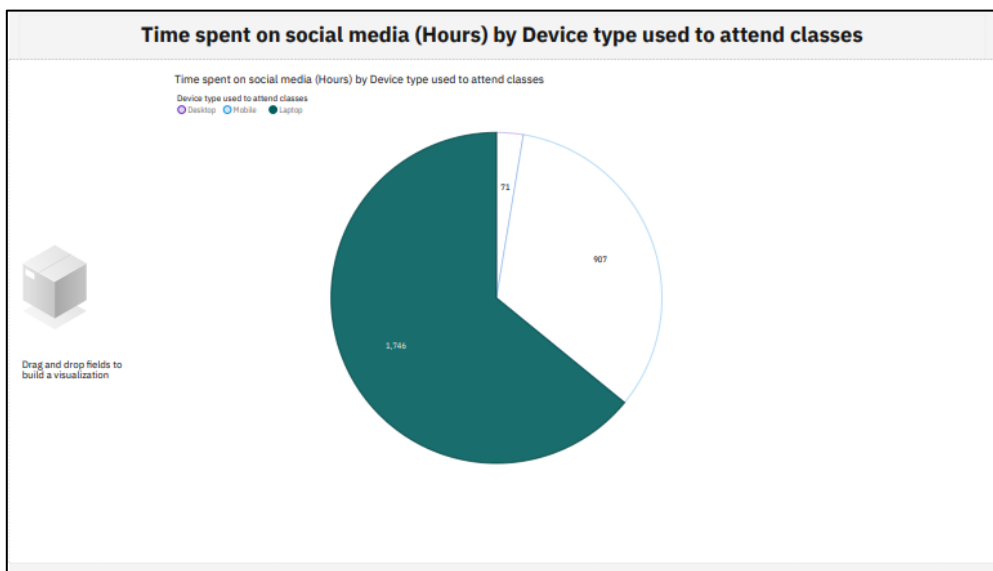
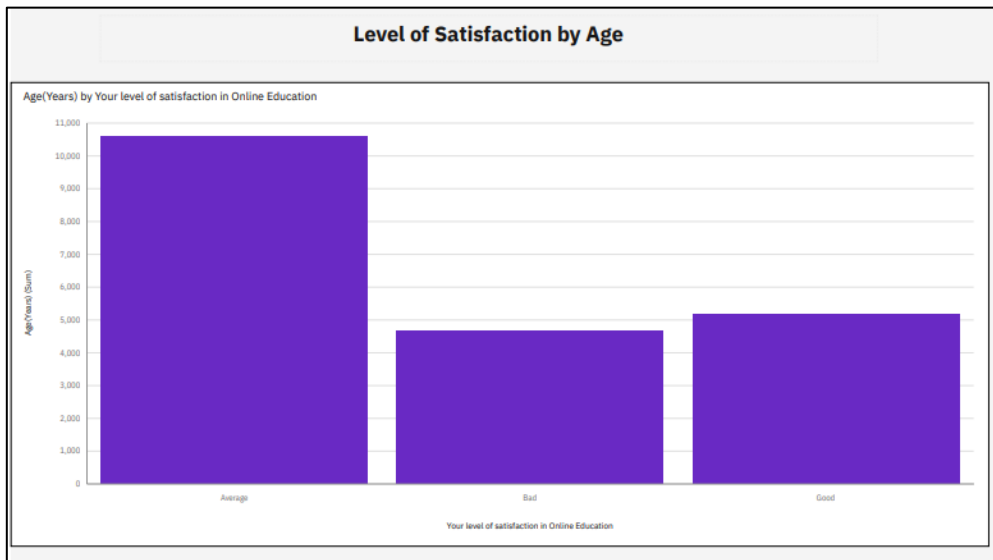
Average marks scored before pandemic in traditional classroom sized by Average marks scored before pandemic in traditional classroom

Average marks sc...

1 343



## Online Education Story

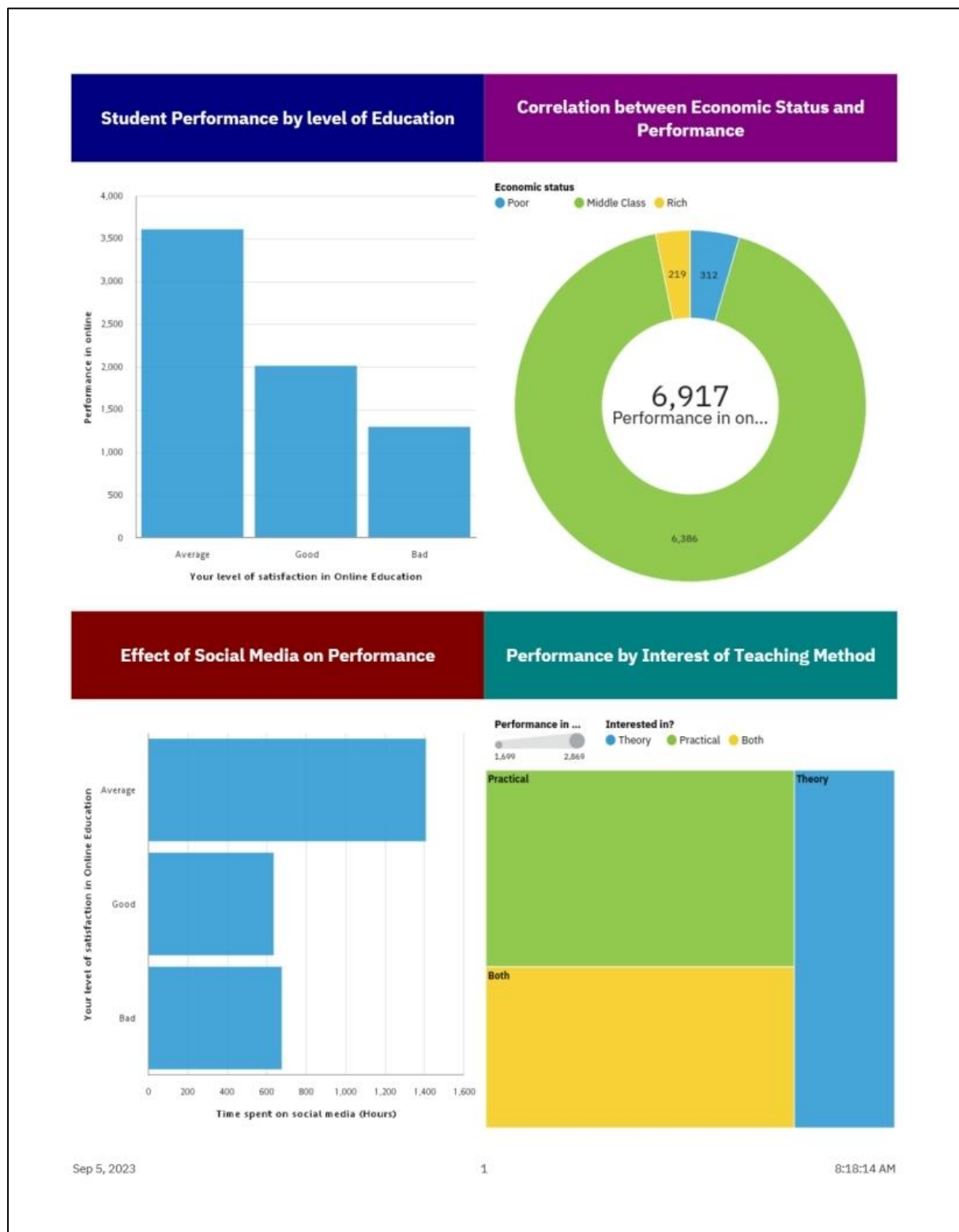


### Correlation between economic status, home & student online performance

Economic status, Home Location and Performance in online

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
Summary		7.3
Summary		6.7

## Online Education Report



## 7 ADVANTAGES & DISADVANTAGES

### Advantages of Online Education

- Online classes allow students to be more flexible with their schedules because they can attend classes from the comfort of their own homes. They can divide their time and plan their daily schedule accordingly. This flexibility also allows them to learn about other things that interest them; they can take online lessons or enrol in other courses. As a result, they expand their knowledge as well as their personality. Aside from that, they can even spend the rest of their time developing their offline hobbies.
- Online education is easily available everywhere and at any time if one has a reliable internet connection. In contrast to offline lectures where you only attend once and take notes, students can record online classes and sessions for future reference.
- In comparison to offline school, where fees range from transportation to uniforms, extracurriculars, and a variety of other things, the whole education cost in online education is deducted fairly. Apart from the fixed costs, the only costs are the internet connection and devices, both of which are widely available in most families today.
- Because of the reasons stated above, online education is far more convenient than traditional education. Even when it comes to attending classes, students feel more at ease in online classes. The medium not only saves time but also resources for students and teachers.

### **Disadvantages of Online Education**

- Any connectivity issues that may arise are one of the key downsides of online education. Because electricity and connectivity are very unprecedented, depending on the geographical area, technical challenges may arise, which can be a significant barrier to online education.
- For a teacher, one of the major disadvantages of online education is managing student attention. When a teacher is teaching an online class, it can be difficult for them to focus on each student. It can be tough to tell who is focused and who is simply attending the class for the sake of attending. Overall, it means less interaction between the teacher and the students, which could make it difficult to communicate what is being taught effectively.
- Another significant and unavoidable disadvantage of online classes is the amount of time spent in front of the computer. Students end up looking at screens for longer periods of time than usual, which might be harmful to their health.



- Online education, unlike offline education, does not allow students to engage with their peers daily. A kid can video chat and converse on the phone with friends and peers, but it isn't the same as having those conversations in a school setting. Interaction with classmates in school teaches a student a lot of things and aids in the development of numerous skills such as leadership, teamwork, and so on. Online education eliminates the need to attend school, resulting in little to no interaction with peers and a significant loss of experience.

## 8 APPLICATIONS

Online education is a form of education that uses the internet to deliver teaching and learning content and activities. It has various applications, such as expanding educational opportunities, transforming student populations, developing new pedagogical methods, and evaluating and analysing the classroom teaching effect. Here are some examples of the applications of analysis of the online education system:

- It can be used in Analysing the Complexities of Online Education Systems
- The effects of online education on academic success can be studied.
- It aids in Optimization of Online Education and Teaching Evaluation System

## 9 CONCLUSION

The online education system has both pros and cons. IBM Cognos Analytics provides new insights into the key factors of accessibility, educator preparation, and student engagement. Using IBM Cognos Analytics, we can use data to improve these factors and enhance the effectiveness of virtual classrooms.

## 11 BIBLIOGRAPHY

1. J. Chang, "Online Instruction and Offline Classroom Teaching: A Study on Parallel Education Systems," 2021 9th International Conference on Information and Education Technology (ICIET), Okayama, Japan, 2021, pp. 157-160, doi: 10.1109/ICIET51873.2021.9419638.
2. Cui, Y., Ma, Z., Wang, L., Yang, A., Liu, Q., Kong, S. and Wang, H., 2023. A survey on big data-enabled innovative online education systems during the COVID-19 pandemic. *Journal of Innovation & Knowledge*, 8(1), p.100295.
3. Online vs Offline Education, Inspiria Knowledge Campus, <https://inspiria.edu.in/online-vs-offline-education-advantages-and-disadvantages/>

4. Analyzing the Complexities of Online Education Systems  
<https://link.springer.com/article/10.1007/s11528-020-00538-9>.
5. The effects of online education on academic success  
<https://link.springer.com/article/10.1007/s10639-021-10740-8>.
6. Optimization of Online Education and Teaching Evaluation System Based  
<https://www.hindawi.com/journals/cin/2021/8785127/>.
7. Sustainability | Free Full-Text | The Effectiveness of Online Education.  
<https://www.mdpi.com/2071-1050/13/9/5311>.

## APPENDIX

### 1. Index.html

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="utf-8">
  <meta content="width=device-width, initial-scale=1.0" name="viewport">
  <title>FlexStart Bootstrap Template - Index</title>
  <meta content="" name="description">
  <meta content="" name="keywords">
  <!-- Favicons -->
  <link href="assets/img/favicon.png" rel="icon">
  <link href="assets/img/apple-touch-icon.png" rel="apple-touch-icon">
  <!-- Google Fonts -->
  <link
href="https://fonts.googleapis.com/css?family=Open+Sans:300,300i,400,400i,600,600i,700,700i|Nunito:300,300i,400,400i,600,600i,700,700i|Poppins:300,300i,400,400i,500,500i,600,600i,700,700i" rel="stylesheet">

  <!-- Vendor CSS Files -->
  <link href="assets/vendor/aos/aos.css" rel="stylesheet">
  <link href="assets/vendor/bootstrap/css/bootstrap.min.css" rel="stylesheet">
  <link href="assets/vendor/bootstrap-icons/bootstrap-icons.css" rel="stylesheet">
  <link href="assets/vendor/glightbox/css/glightbox.min.css" rel="stylesheet">
  <link href="assets/vendor/remixicon/remixicon.css" rel="stylesheet">
  <link href="assets/vendor/swiper/swiper-bundle.min.css" rel="stylesheet">

  <!-- Template Main CSS File -->
  <link href="assets/css/style.css" rel="stylesheet">

  <!-- =====
  * Template Name: FlexStart
  * Updated: Aug 30 2023 with Bootstrap v5.3.1
  * Template URL: https://bootstrapmade.com/flexstart-bootstrap-startup-template/
  * Author: BootstrapMade.com
  * License: https://bootstrapmade.com/license/
  ===== -->
</head>
```

```

<body>

<!-- ===== Header ===== -->
<header id="header" class="header fixed-top">
  <div class="container-fluid container-xl d-flex align-items-center justify-content-between">

    <a href="index.html" class="logo d-flex align-items-center">
      
      <span>Online Education System</span>
    </a>
    <nav id="navbar" class="navbar">
      <ul>
        <li><a class="nav-link scrollto active" href="#hero">Home</a></li>
        <li><a class="nav-link scrollto" href="#about">Report</a></li>
        <li><a class="nav-link scrollto" href="#services">Dashboard</a></li>
        <li><a class="nav-link scrollto" href="#portfolio">Story</a></li>
        <li><a class="nav-link scrollto" href="#contact">Contact</a></li>
        <li><a class="getstarted scrollto" href="#about">Get Started</a></li>
      </ul>
      <i class="bi bi-list mobile-nav-toggle"></i>
    </nav><!-- .navbar -->
  </div>
</header><!-- End Header -->

<!-- ===== Hero Section ===== -->
<section id="hero" class="hero d-flex align-items-center">

  <div class="container">
    <div class="row">
      <div class="col-lg-6 d-flex flex-column justify-content-center">
        <h1 data-aos="fade-up">Unveiling The Virtual Classroom: An In-Depth Analysis Of The Online Education System</h1>
        <h2 data-aos="fade-up" data-aos-delay="400">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. The only reprieve for the students' mental well-being has been the transition to online classes.</h2>
        <div data-aos="fade-up" data-aos-delay="600">
          <div class="text-center text-lg-start">
            <a href="#about" class="btn-get-started scrollto d-inline-flex align-items-center justify-content-center align-self-center">
              <span>Get Started</span>
              <i class="bi bi-arrow-right"></i>
            </a>
          </div>
        </div>
      </div>
      <div class="col-lg-6 hero-img" data-aos="zoom-out" data-aos-delay="200">
        
      </div>
    </div>
  </div>

```

```

    </div>
  </div>
</section><!-- End Hero -->

<main id="main">
  <!-- ===== About Section ===== -->
  <section id="about" class="about">

    <div class="container" data-aos="fade-up">
      <div class="row gx-0">

        <iframe
src="https://us3.ca.analytics.ibm.com/bi/?pathRef=.my_folders%2FOnline%2BEducation%2BReport&closeWindowOnLastView=true&ui_appbar=false&ui_navbar=false&shareMode=embedded&action=run&format=HTML&prompt=false"
width="1100" height="1000" frameborder="0" gesture="media" allow="encrypted-media"
allowfullscreen=""></iframe>
        </div>
        <div class="col-lg-6 d-flex align-items-center" data-aos="zoom-out" data-aos-
delay="200">
          
        </div>
      </div>
    </div>
  </section><!-- End About Section -->
  <!-- ===== Services Section ===== -->
  <section id="services" class="services">

    <div class="container" data-aos="fade-up">
      <iframe
src="https://us3.ca.analytics.ibm.com/bi/?perspective=dashboard&pathRef=.my_folders%2FOnline%2BEducation%2BDashboard&closeWindowOnLastView=true&ui_appbar=false&ui_navbar=false&shareMode=embedded&action=view&mode=dashboard&subView=model0000018a63f13006_00000002" width="1100"
height="1000" frameborder="0" gesture="media" allow="encrypted-media"
allowfullscreen=""></iframe>
      </div>
    </div>
  </section><!-- End Services Section -->
  <!-- ===== Portfolio Section ===== -->
  <section id="portfolio" class="portfolio">
    <div class="container" data-aos="fade-up">
      <iframe
src="https://us3.ca.analytics.ibm.com/bi/?perspective=story&pathRef=.my_folders%2FOnline%2BEducation%2BStory&closeWindowOnLastView=true&ui_appbar=false&ui_navbar=false&shareMode=embedded&action=view&sceneId=model0000018a6408f200_00000002&sceneTime=0" width="1100" height="1000"
frameborder="0" gesture="media" allow="encrypted-media" allowfullscreen=""></iframe>
      </div>
    </div>
  </section>

```

```

</section><!-- End Portfolio Section -->
  <!-- ===== Contact Section ===== -->
<section id="contact" class="contact">

  <div class="container" data-aos="fade-up">
    <header class="section-header">
      <h2>Contact</h2>
      <p>Contact Us</p>
    </header>
    <div class="row gy-4">
      <div class="col-lg-6">
        <div class="row gy-4">
          <div class="col-md-6">
            <div class="info-box">
              <i class="bi bi-geo-alt"></i>
              <h3>Address</h3>
              <p>Hyderabad<br>Telangana, India 500028</p>
            </div>
          </div>
          <div class="col-md-6">
            <div class="info-box">
              <i class="bi bi-telephone"></i>
              <h3>Call Us</h3>
              <p>+91 9885633986</p>
            </div>
          </div>
          <div class="col-md-6">
            <div class="info-box">
              <i class="bi bi-envelope"></i>
              <h3>Email Us</h3>
              <p>shaikrasool@methodist.edu.in</p>
            </div>
          </div>
          <div class="col-md-6">
            <div class="info-box">
              <i class="bi bi-clock"></i>
              <h3>Open Hours</h3>
              <p>Monday - Friday<br>9:00AM - 05:00PM</p>
            </div>
          </div>
        </div>
      </div>
      <div class="col-lg-6">
        <form action="forms/contact.php" method="post" class="php-email-form">
          <div class="row gy-4">
            <div class="col-md-6">
              <input type="text" name="name" class="form-control" placeholder="Your Name"
required>
            </div>
            <div class="col-md-6">

```

```

        <input type="email" class="form-control" name="email" placeholder="Your
Email" required>
    </div>
    <div class="col-md-12">
        <input type="text" class="form-control" name="subject" placeholder="Subject"
required>
    </div>
    <div class="col-md-12">
        <textarea class="form-control" name="message" rows="6"
placeholder="Message" required></textarea>
    </div>
    <div class="col-md-12 text-center">
        <div class="loading">Loading</div>
        <div class="error-message"></div>
        <div class="sent-message">Your message has been sent. Thank you!</div>
        <button type="submit">Send Message</button>
    </div>
</div>
</form>
</div>
</div>
</div>
</div>
</section><!-- End Contact Section -->
</main><!-- End #main -->
<a href="#" class="back-to-top d-flex align-items-center justify-content-center"><i
class="bi bi-arrow-up-short"></i></a>
<!-- Vendor JS Files -->
<script src="assets/vendor/purecounter/purecounter_vanilla.js"></script>
<script src="assets/vendor/aos/aos.js"></script>
<script src="assets/vendor/bootstrap/js/bootstrap.bundle.min.js"></script>
<script src="assets/vendor/glightbox/js/glightbox.min.js"></script>
<script src="assets/vendor/isotope-layout/isotope.pkgd.min.js"></script>
<script src="assets/vendor/swiper/swiper-bundle.min.js"></script>
<script src="assets/vendor/php-email-form/validate.js"></script>
<!-- Template Main JS File -->
<script src="assets/js/main.js"></script>
</body>
</html>

```

## 2. App.py

```

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

```