

# Wayspire Student Performance & Engagement EDA

**AYESHA**

September 29, 2025

—

EDA & Visualization for Wayspire

—

**WAYSPIRE**

---

## INTRODUCTION

This report presents the findings of an **Exploratory Data Analysis (EDA)** and visualization project conducted on Wayspire's mock student engagement and sales data. The primary objective is to convert raw data into actionable business intelligence by identifying key performance trends, understanding student behavior, and providing data-driven recommendations to optimize program offerings and marketing efforts.

### About Wayspire

Wayspire is a dynamic e-learning platform dedicated to skill development, offering specialized courses across various in-demand technology and finance domains. Its mission is to bridge the skills gap by providing high-quality, flexible educational programs to a global audience. The sustained success of Wayspire relies on understanding student enrollment



## DATA SOURCES

---

The analysis was performed on **student dataset simulating Wayspire's operational data**, encompassing nearly 1000 **student records**.

- **Program:** Product Portfolio Demand- Which courses are students approach highly.This drives curriculum investment and marketing focus.
  - **Enrollment :** DateMarket Timing and Growth- When are students enrolling? This reveals **seasonal trends** and the overall pace of business growth over time.
  - **Completion Status:**Program Success and Retention- This is the ultimate metric for student success. It tracks **retention rates** and identifies how many customers successfully finish the product.
  - **Quiz Score:**Learning Efficacy and Quality-A direct measure of how well students are mastering the content and the **effectiveness** of the curriculum.
  - **Attendance Rate (%):**Student Engagement and Effort:-A leading indicator of student commitment. Low attendance often predicts a higher dropout risk.
  - **State:**Geographic Market Concentration- Where are our customers located? This guides regional marketing budget allocation and market penetration strategy.
  - **Fee Paid :**Revenue and Pricing-The sales data, used to calculate total revenue, program profitability, and to evaluate current pricing strategies.
-

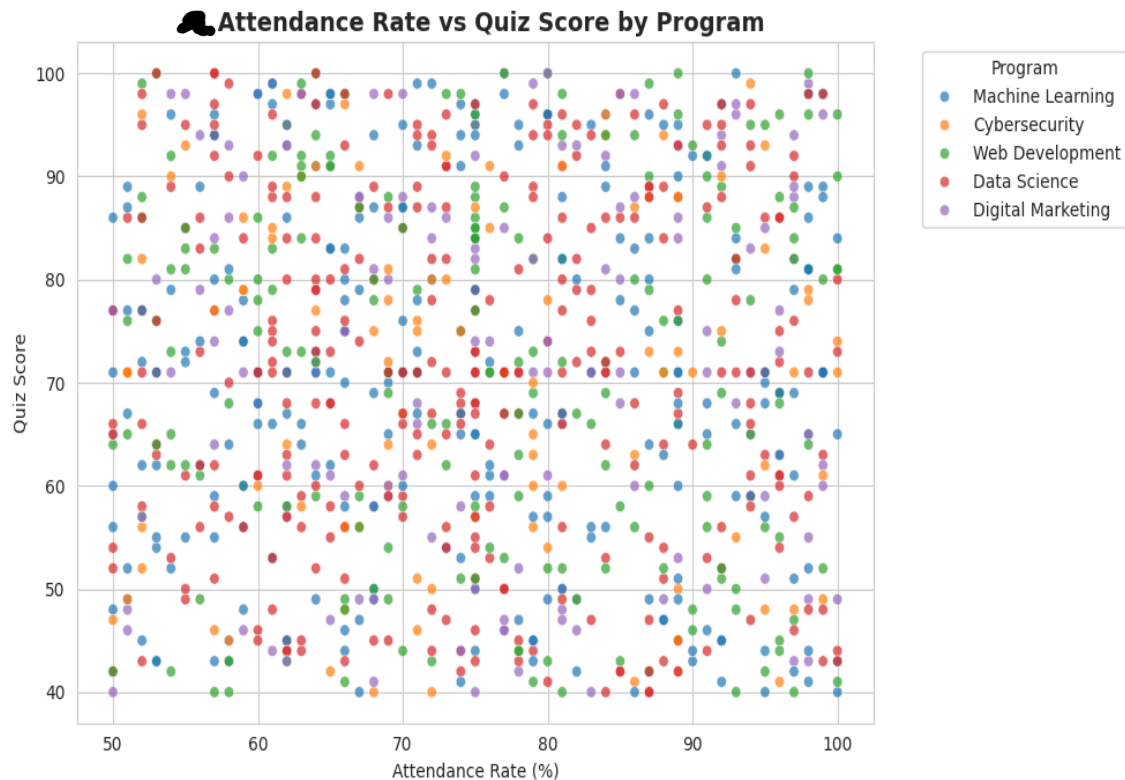


## METHODOLOGY

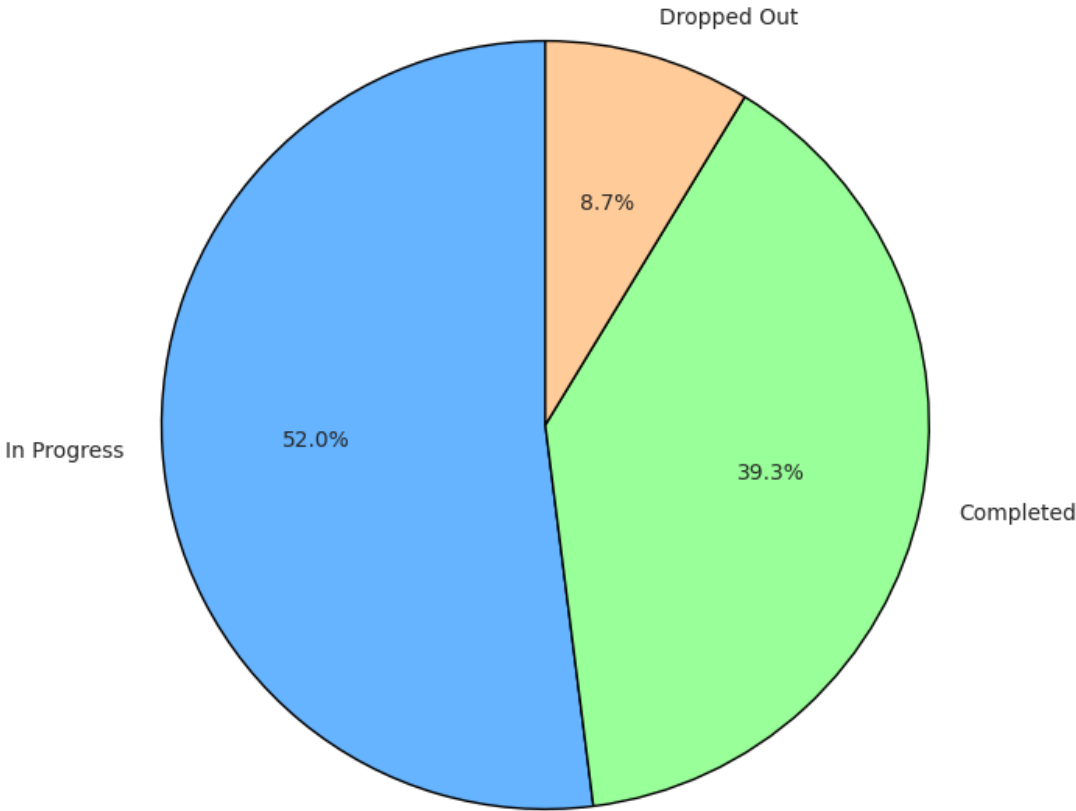
- **Data Cleaning:** Handled missing values by imputing the **mean** for the few missing Quiz\_Score entries. Ensured data consistency by converting categorical columns (Program, State) to title case and converting Enrollment\_Date to a datetime object.
- **Univariate Analysis:** Used **Histograms and Box Plots** to analyze the distribution, median, and variance of individual features like Quiz\_Score and Attendance\_Rate (%).
- **Bivariate and Multivariate Analysis:** Employed **Scatter Plots** (Attendance vs. Score), **Box/Violin Plots** (Score by Program), and **Stacked Bar Charts** (Completion by Program) to investigate relationships between variables.
- **Time-Series Analysis:** A **Line Plot** was generated using the Enrollment\_Date to identify growth trends and seasonality.

## KEY VISUALIZATIONS

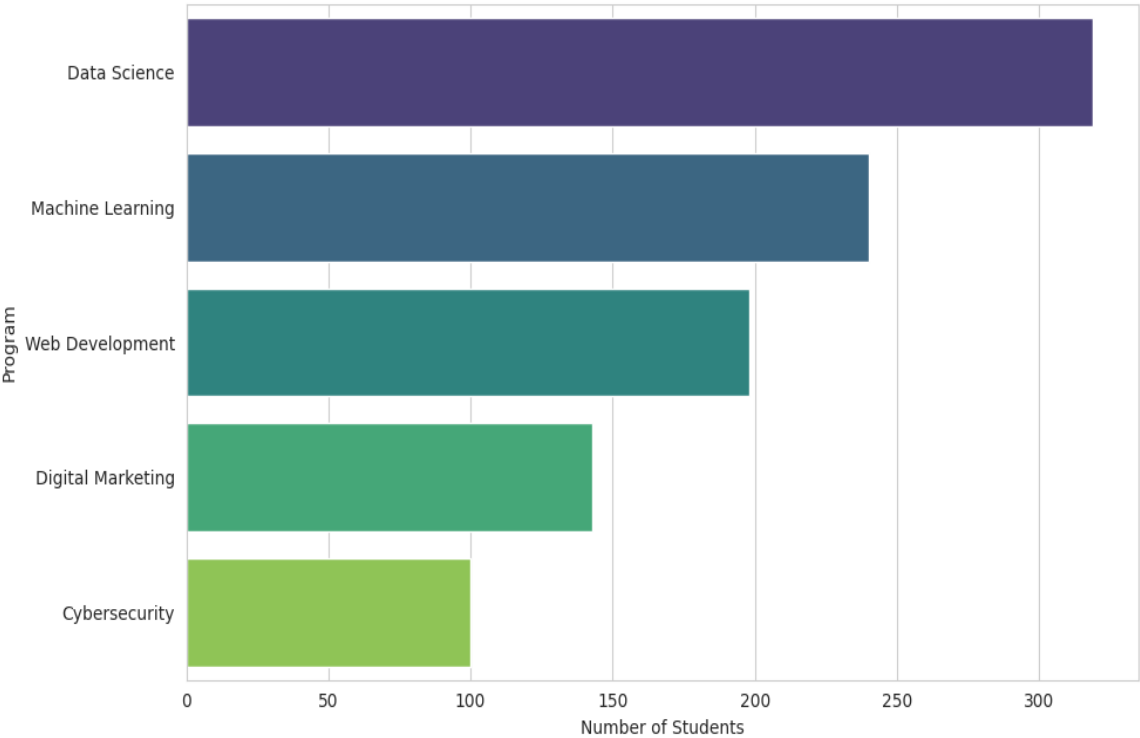
- **Program Enrollment (Bar Chart):** Shows the highest-demand programs.
- **Completion Status (Pie Chart):** Illustrates the overall success rate vs. ongoing enrollment and dropouts.
- **Attendance vs. Quiz Score (Scatter Plot):** Visually confirms the correlation between effort and outcome.
- **Enrollment Trend Over Time (Line Chart):** Highlights spikes and dips in enrollment across the analyzed period.



2. Completion Status Distribution



1. Number of Students Enrolled in Each Program



## ***Key insights***

Based on the visualizations and statistical analysis core insights are as follows:

- **Program Performance & Demand:** Data Science and Web Development lead significantly in enrollment. However, programs like Financial Analysis and Cloud Computing show lower relative demand, suggesting these areas are currently untapped or require repositioning.
- **Student Success Rate:** The overall program completion rate is strong, with  $\approx 50-55\%$  of students achieving a 'Completed' status. Retention efforts should focus on the  $\approx 35-40\%$  of students who are 'Ongoing' to ensure they finish.
- **Engagement-Performance Link:** There is a strong positive correlation between Attendance Rate (%) and Quiz Score. Students with higher attendance are overwhelmingly more likely to complete the program and achieve a high score.
- **Seasonality:** Enrollment volume is not uniform. The time-series plot shows potential spikes (e.g., beginning of quarters) and minor dips (e.g., holiday seasons), indicating a degree of predictable seasonality.

# SUGGESTIONS

To leverage these insights and improve key business metrics ,the following recommendations are put forth:

- Implement an Early Intervention System
- Optimize Program Marketing Mix
- Refine Regional Strategy
- Align Resource Allocation with Seasonality

*This EDA confirms that Wayspire has a solid foundation with high engagement in core programs. The key to future growth and operational efficiency lies in leveraging the identified relationships, particularly the strong link between attendance and completion. By utilizing the recommended data-driven strategies especially early intervention based on engagement metrics Wayspire can significantly enhance student success rates and strategically maximize enrollment across its program portfolio.*