Project Report

E-Learning Student Engagement and Dropout Analytics

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1.Introduction

E-learning has rapidly become an essential mode of education, providing flexibility and accessibility to students worldwide. However, two major challenges persist: low student engagement and high dropout rates. Understanding these issues is critical for improving course outcomes, enhancing learning experiences, and supporting student success. This project aims to analyze student behavior data to uncover insights about engagement, performance, and dropout patterns using Excel-based analysis and dashboards.

2. Objectives

- To measure and analyze student engagement levels through activity metrics such as logins, time spent, quizzes, and forum participation.
- To study the relationship between engagement and performance in e-learning.
- To identify dropout trends and the key factors contributing to dropouts.
- To present the findings visually using interactive dashboards in Excel.
- To provide actionable recommendations to improve retention and learning outcomes.

3. Dataset Overview

The dataset consists of 800 students and includes multiple variables related to their e-learning activities:

- Logins per Week
- Time Spent on Platform (in hours)
- Number of Quizzes Attempted
- Assignments Submitted
- Forum Posts
- Final Score
- Completion Status (Completed / Dropped)

Data cleaning steps included removing duplicates, handling missing values, and renaming

inconsistent column headers. Transformations were performed to create an Engagement Score and group ranges for easier analysis.

4. Methodology

The analysis followed a structured process:
1. Data Collection – Dataset of 800 student records.
2. Data Cleaning – Removed duplicates and standardized formatting.
3. Data Transformation – Created new variables such as Engagement Score and grouped ranges for logins, quizzes, and time spent.
4. Data Analysis – Used PivotTables and charts in Excel to analyze patterns in engagement, performance, and dropout.
5. Dashboard Creation – Developed three dashboards (Engagement, Performance, Dropout) for clear visualization.

5. Analysis & Findings

5.1 Engagement Dashboard

- Most students fall under the medium engagement category.
- High-engagement students are more likely to complete the course.
- Forum participation shows a strong correlation with better scores.

5.2 Performance Dashboard

- Students attempting more quizzes and submitting more assignments generally achieve higher final scores.
- The majority of students score in the mid-range, with a smaller proportion achieving top scores.
- The top 10 students by score were identified for benchmarking.

5.3 Dropout Dashboard

- Dropout rate is approximately 18%.
- Dropouts are concentrated among low-engagement and low-score students.
- Dropouts peak in the middle stages of the course.
- Funnel and pie charts clearly highlight the dropout versus completion ratio.

6. Key Insights

- Engagement is directly linked to performance; higher engagement leads to better outcomes.
- Dropouts are strongly associated with low engagement and poor scores.
- Monitoring activity metrics such as logins and forum posts can help predict at-risk

students early.
- Visual dashboards provide an efficient way to track learning progress and retention rates.

7. Recommendations

- Encourage students to log in frequently and participate in platform activities.
- Promote quizzes and forum discussions as a way to improve understanding and engagement.
- Provide early intervention and support for students showing low activity or low scores.
- Track dropout trends regularly to enable timely actions.
- Use dashboard insights to redesign learning modules and engagement strategies.

8. Conclusion

This project demonstrates how data analytics can provide valuable insights into student engagement, performance, and dropout behavior in e-learning. By leveraging Excel tools such as PivotTables, charts, and dashboards, we were able to uncover patterns and make meaningful recommendations. Implementing these insights can help institutions reduce dropout rates, enhance learning experiences, and ensure greater student success.