Power BI Dashboard — 2013–2014 — Performance, Engagement & Risk

Student Performance & Engagement Analytics (OULAD)

Week 4 — Insights & Storytelling Report

Course:	IT300 — Business Intelligence
Institution:	Tunis Business School
Dataset:	Open University Learning Analytics Dataset (OULAD)
Period:	2013–2014 (Presentations: 2013B, 2013J, 2014B, 2014J)
Tool:	Microsoft Power BI (Star Schema + DAX)

Group Members:
Youssef Mabrouk
Adam Haji
Jaouher Chouchane
Mohammed Sanad

January 4, 2026

1. Project Context & Objectives

1.1 Problem statement

This project analyzes learner outcomes and engagement patterns to identify:

- How student performance varies by module and presentation (term/session).
- Whether engagement (click activity) aligns with higher average scores.
- Where at-risk concentration appears across modules and demographic/equity segments.

1.2 Data model (high level)

A star schema was built around a central fact table (student-course level) and dimensions such as Students, Courses, Time, and Assessments. This structure enables consistent slicing by module, term, year, region, and socio-economic band.

1.3 KPI definitions used in dashboards

KPI	Meaning / how to interpret
Avg Score	Average final score (overall or filtered by slicers).
Pass Rate (%)	Percentage of records where the outcome indicates pass/success.
Failure Rate (%)	Percentage of records where the outcome indicates fail/unsuccessful.
At-Risk (%)	Share of learners flagged as at-risk.
Total Clicks	Total VLE interaction volume; proxy for engagement intensity.

2. Dashboard Overview (What each page answers)

2.1 Home page (navigation)

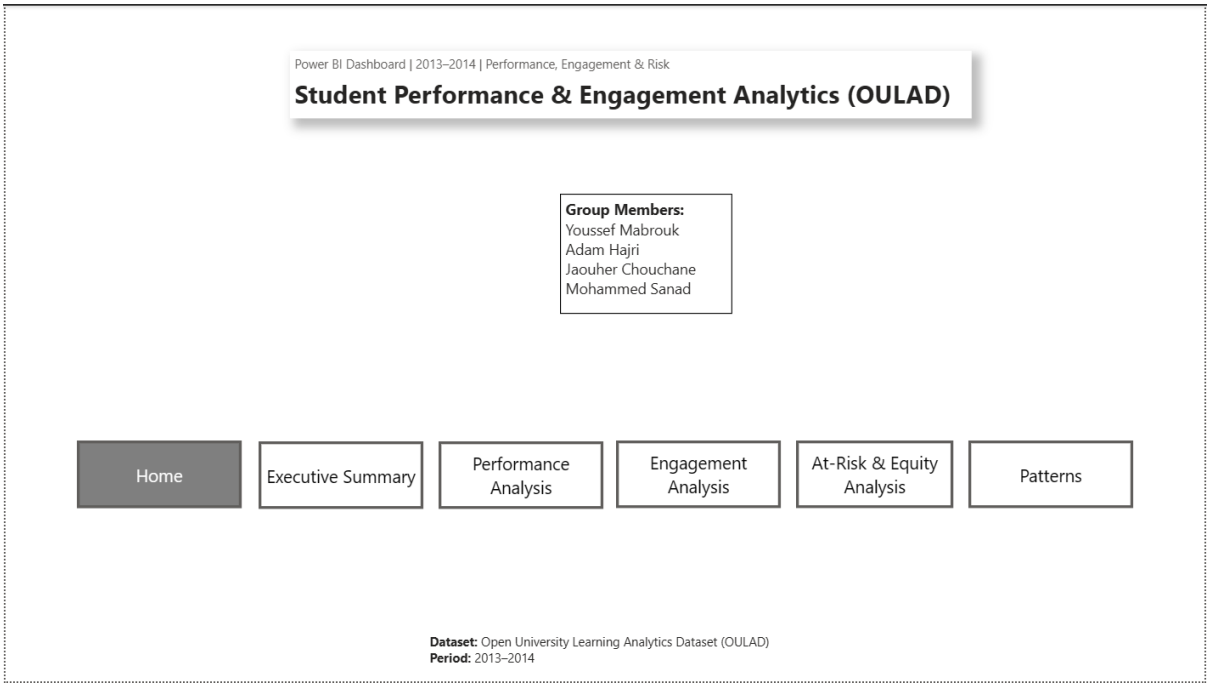


Figure 1: Home page with navigation buttons and project summary.

2.2 Executive Summary (headline metrics)

This page provides an overall snapshot and top-level patterns:

- Overall performance (Avg Score, Pass/Fail rates).
- At-risk proportion and engagement volume (Total Clicks).
- Quick views: trend by presentation and pass rate by module.

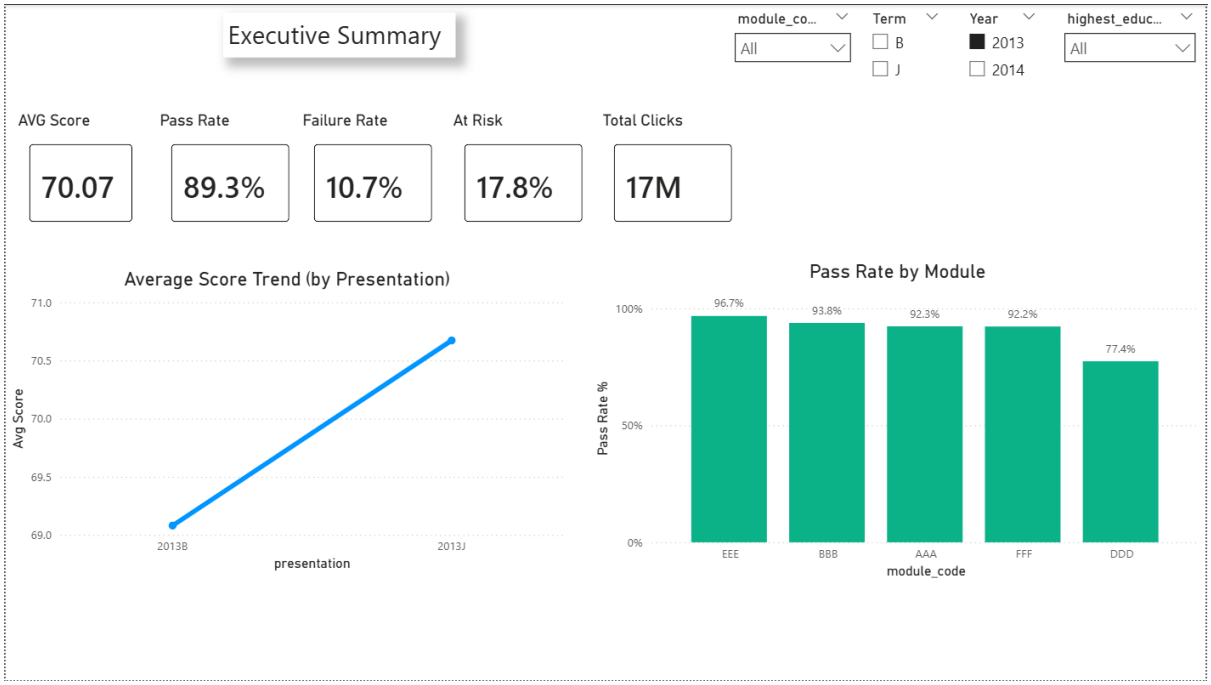


Figure 2: Executive Summary dashboard.

2.3 Performance, Engagement, Risk, Patterns pages

- **Performance Analysis:** compares modules and education levels.
- **Engagement Analysis:** relates clicks + engagement scores to performance.
- **At-Risk & Equity:** shows where at-risk is concentrated (module/term/region).
- **Patterns:** matrix/heatmap view across Module × Presentation.

3. Key Findings (and why they matter)

Insight 1 — Best overall module

Finding: Module **EEE** leads overall with the highest total Pass Rate and Avg Score.
Why it matters: EEE can be used as a benchmark for learning design and support practices (what worked there can be replicated).

Insight 2 — Weakest overall presentation

Finding: 2014B is the weakest presentation overall (lower Pass Rate and Avg Score vs other sessions).
Why it matters: This points to time-specific issues (cohort differences, delivery changes, assessment difficulty) and is the best target for interventions.

Insight 3 — Engagement is not always equal to performance

From the Engagement bubble/scatter view:

- Some modules show **high engagement but mid scores** (students interact a lot but don't necessarily learn efficiently).
- Others achieve **strong scores with moderate engagement** (more efficient learning path).

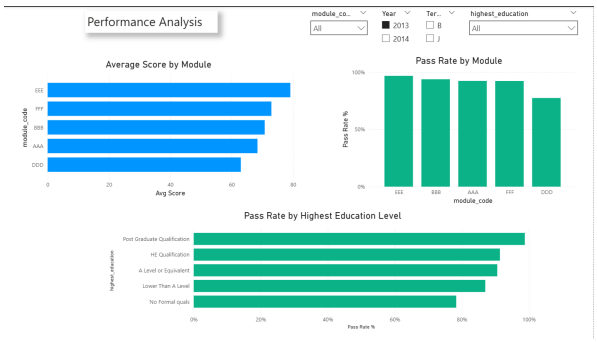
Why it matters: This helps identify whether effort is translating into outcomes, and where students may be "stuck" despite activity.

Insight 4 — Equity pattern in at-risk distribution

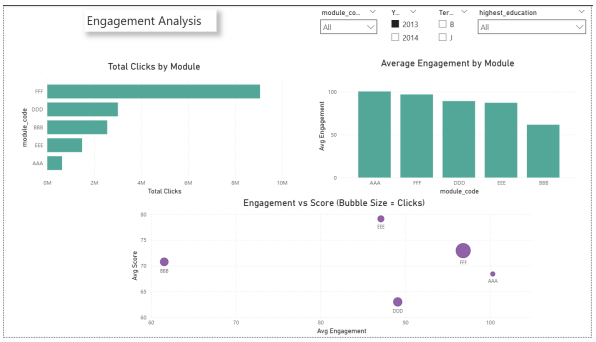
At-risk rates differ across segments (e.g., region, socio-economic band):

- Certain regions show systematically higher at-risk shares.
- Deprivation band differences suggest equity gaps.

Why it matters: Supports targeted support policies instead of one-size-fits-all interventions.



(a) Performance Analysis



(b) Engagement Analysis

Figure 3: Dashboards supporting Insights 1–3.

4. Recommendations (5–8 actions)

4.1 Risk-focused recommendations

1. **Prioritize 2014B support plan:** introduce early diagnostic checks, extra tutoring windows, and assessment guidance.
2. **Module-level intervention:** focus coaching and resources on the lowest-performing module(s) (e.g., CCC / DDD depending on filters).
3. **At-risk early warning:** create a simple rule using low engagement + low score bands to flag students earlier.

4.2 Engagement + learning design recommendations

4. **Convert clicks into learning:** for high-click modules with average scores, review VLE structure and add guided paths (reduce "wandering").
5. **Replicate success patterns from EEE:** reuse its activity structure, pacing, and resource types in weaker modules.

4.3 Equity recommendations

6. **Targeted regional support:** allocate extra support to regions with highest at-risk rate.
7. **Support for deprivation bands:** offer extra scaffolding and support materials where at-risk is highest.

4.4 Limitations and future improvements

Limitations:

- Clicks measure quantity of activity, not learning quality.
- Aggregation can hide student-level variability and causal factors.
- Some segments may have small sample sizes after filtering.

Future improvements:

- Add cohort segmentation (new vs returning students, prior attempts).
- Add drill-through pages (Module → Student list for at-risk follow-up).
- Add a time-series engagement trend (weekly/monthly) if event-level time exists.

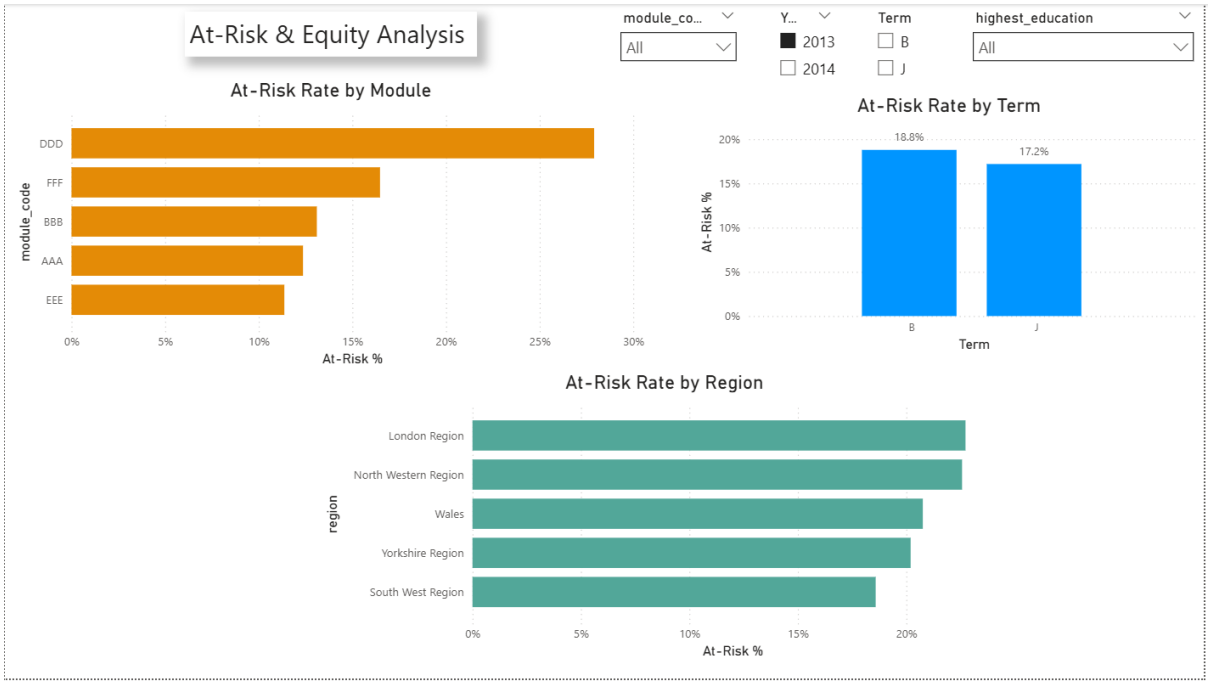


Figure 4: At-Risk & Equity dashboard supporting Insight 4.

5. Patterns Summary (Module × Presentation)

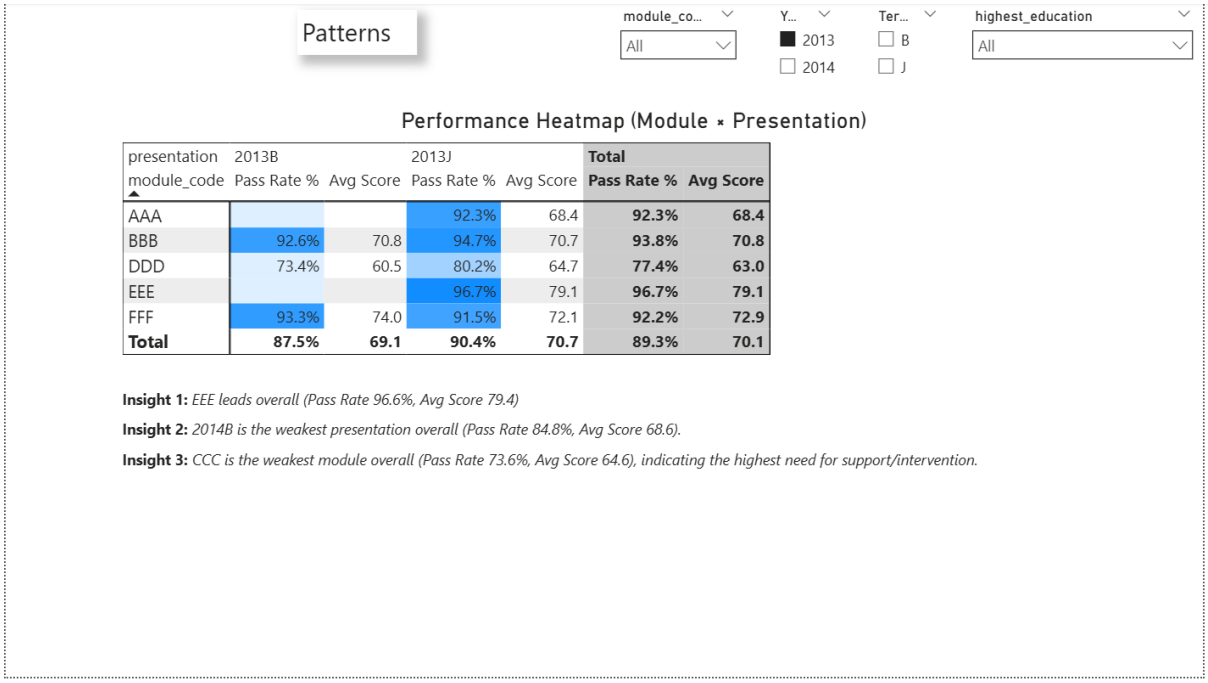


Figure 5: Performance heatmap (Matrix) across Module and Presentation with Pass Rate and Avg Score.

5.1 Submission package checklist

Include a ZIP with:

- `/data_cleaned` (final cleaned CSVs)
- `/etl` (Power Query scripts)
- `/model` (schema screenshot + measure definitions)
- `/dashboard` (PBIX)
- `/report` (this PDF)