

Learning Path Dashboard for Enhancing Skills — Project Kit

Engineer's Planet • Government of NCT of Delhi — Software (EdTech)

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Overview

Build a dashboard that tracks learning progress and helps instructors create personalised learning paths for students. Integrate multiple resources, monitor progress in real-time, and surface insights to drive mastery and timely interventions.

Expected Outcome

Provide tailored learning experiences that improve completion and mastery while giving instructors live visibility to guide cohorts effectively.

Why This Project (Value & Use Cases)

- Personalised paths: rules-based engine recommends the 'next best module'.
- Real-time visibility for instructors: at-risk learners, cohort progress, exportable reports.
- Actionable analytics: time-on-task, mastery growth, drop-off points, and resource effectiveness.

Architecture Option A — Supabase + React + BI Embed

- DB/Auth: Supabase (PostgreSQL)
- Frontend: React/Next.js
- Dashboards: Power BI / Tableau Embedded
- Auth & RLS; serverless functions for reminders

Architecture Option B — Django + PostgreSQL + Plotly

- Backend: Django + Django REST Framework
- DB: PostgreSQL
- Dashboards: Plotly/Dash
- Task queue: Celery + Redis (reminders, jobs)

SRS (PreFilled)

Purpose

Deliver an adaptive learning path dashboard for students and instructor console.

Scope

Student & instructor roles, tracking, recommendations, reports.

Stakeholders

Students, Instructors, Program Coordinators, IT/Infra.

Functional Requirements

FR1 profile/auth • FR2 cohorts • FR3 path engine • FR4 progress • FR5 exports

NonFunctional

Availability $\geq 99\%$, P95 load $< 2s$, secure auth, audit logs, GDPR consent.

Assumptions/Dependencies

OAuth provider ready; BI licenses if embedded; single institution for MVP.

Out of Scope (MVP)

Adaptive ML engine, LMS gradebook sync, LTI integration.

Acceptance Criteria

Cohort report export works; student progress persists; prereq rules respected.

Data Model (Relational Schema)

students

Column	Type
student_id (PK)	bigint
name	text
email (unique)	text
semester	int
track	text

instructors

Column	Type
instructor_id (PK)	bigint
name	text
email (unique)	text

courses

Column	Type
course_id (PK)	text
course_name	text
category	text
prereq	text

modules

Column	Type
module_id (PK)	text
course_id (FK→courses)	text
title	text
difficulty	text
time_mins	int

enrollments

Column	Type
enrollment_id (PK)	bigserial
student_id (FK→students)	bigint
course_id (FK→courses)	text
enrolled_at	timestamp

learning_paths

Column	Type
path_id (PK)	bigserial
name	text
description	text

path_assignments

Column	Type
path_id (FK→learning_paths)	bigint
student_id (FK→students)	bigint
assigned_at	timestamp

progress_events

Column	Type
event_id (PK)	bigserial
student_id (FK→students)	bigint
module_id (FK→modules)	text
status	text
score	int
time_spent_mins	int
event_ts	timestamp

assessments

Column	Type
assessment_id (PK)	bigserial
module_id (FK→modules)	text
max_score	int
passing_score	int

resources

Column	Type
resource_id (PK)	bigserial
module_id (FK→modules)	text
type	text
url	text

cohorts

Column	Type
cohort_id (PK)	bigserial

name	text
owner_instructor_id (FK→instructors)	bigint

KPI Checklist

- Active learners per week; time-on-task per module
- Module completion rate; mastery improvement
- At-risk cohort %, intervention-to-improvement time
- Resource effectiveness (completion → score lift)

Milestones & Timeline (4–6 Weeks)

- Week 1: SRS, schema, wireframes
- Week 2: Profiles + data ingestion
- Week 3: Progress tracking + student view
- Week 4: Instructor dashboard + exports
- Week 5: BI embed + polish
- Week 6: QA, test report, presentation

Sample Data (CSV)

sample_students.csv

sample_courses.csv

sample_modules.csv

sample_progress.csv