Important Links:
Figma Link:
https://www.figma.com/design/giSKhdkcuhuUjec9CIJiqs/-UPDATED_PROTOTYPE-LearnSmart?node-id=34-82&t=BI6wEbrzHdIYfsrR-1

Github repo
Mobile: https://github.com/jannpio/mobile_learnsmart.git
Web: https://github.com/jannpio/web_learnsmart.git

General Objectives
To design and develop LearnSmart, an AI powered and data driven learning platform for criminology review students that delivers personalized study techniques, tracks learning behaviors, and provides performance analytics to improve exam preparation and retention.
Specific Objectives
Specifically, the capstone project aims to:

1. Design and develop a mobile feature for students that recommends and delivers personalized study techniques and personalized learning paths based on their learning needs.
2. Develop a web system for RKM Criminology Solutions instructors and administrators to view student data, monitor progress, and manage learning resources.
3. Integrate Data Analytics and AI-Assisted that automatically generate quizzes from study materials, provide real time feedback, and support adaptive learning based on each student's performance and activity data.
4. Improve the system responsiveness, reliability, and overall software quality by applying the FURPS quality model and aligning development with ISO 25010 standards. Ensure that quizzes generate quickly, feedback updates in real time, and the platform works smoothly across various mobile devices and operating systems.
5. Implement secure login and authentication for students and admins, encrypt all sensitive data during storage and transmission, and control access so that only authorized users can view analytics and use learning tools.

📍 **Flow Example**
(Scenario: Student studying Criminal Law, chooses Active Recall)

1. **Start**

- Students log into LearnSmart mobile app.
- Chooses *Criminal Law Module*.
- Picks Active Recall as study technique.

2. **Gemini Quiz Generation**

- The system pulls the specific module content.
- Gemini generates Active Recall–style questions flashcards.

3. **Quiz Attempt**

- Students answer all questions.
- The system scores answers in real-time.

4. **Descriptive Analytics Applied Here**

- Records:
    - % correct answers per topic
    - Average time per question

    - Most missed concepts
    - Chosen study technique
- Generates a performance snapshot for the attempt.

5. Performance Evaluation

- Pass Condition: Score ≥ 80% → Student moves to next topic/module.
- Fail Condition: Score < 80% → Trigger remedial path.

If Student Passes

- **Prescriptive Analytics Applied Here**:
    - Recommends next topic and optimal difficulty for upcoming quizzes.
    - Suggests keeping or slightly modifying current study technique if it's effective.
- Next module/topic unlocked.
- Gemini adapts difficulty slightly higher for the next quiz.
- Progress tracker shows improvement.

If Student Fails

- **Descriptive Analytics:** Identifies weak subtopics (e.g., "Criminal Negligence").
- **Prescriptive Analytics:**
    - Recommends switching to a more supportive study technique.
        - Example: From Active Recall → Spaced Repetition.
    - Schedules optimal review timing (e.g., 2 days later) for maximum retention.
- Gemini generates remedial quizzes focusing only on missed concepts (Different kind of quiz. For example, in the post-exam in module 1 there is a multiple choice, in the remedial quiz, it will become an identification type of quiz.
- System schedules follow-up quiz as part of spaced repetition cycle.

Continuous Personalization

- Each quiz result updates the student's personalized learning path.
- Descriptive Analytics: Tracks mastery trends, study technique effectiveness, and engagement patterns.
- Prescriptive Analytics: Continuously adjusts recommended study techniques, difficulty progression, and review scheduling.
- Over time:
    - Topics mastered → less frequent review.
    - Weak topics → appear more often in quizzes.
- The student's path becomes unique compared to others in the same review center.

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1. Active Recall

- Present the student with AI-generated flashcards (via Gemini) **before** showing the learning material.
- After reading, the student answers from memory before revealing the correct answer.
- Flashcards can include:
    - Fill-in-the-blank prompts
    - Definition recall
    - Concept-to-example matching
- The system hides answers until the student attempts, reinforcing memory retrieval.

System Behavior:

- **Descriptive Analytics:**
- Log the number of flashcards answered correctly.
- Track frequency of flashcard usage and total time spent.
- Identify “hard recall” flashcards — those repeatedly missed or delayed in recall.

- **Prescriptive Analytics:**
- Suggest follow-up flashcard sessions focusing on missed concepts.
- If recall scores remain low, shift the student’s learning path toward **Retrieval Practice**.

2. Pomodoro

Implementation:

- Launch a built-in Pomodoro timer (e.g., 25 mins study + 5 mins break).
- Lock or minimize distractions during the timer.
- Encourage students to take notes or complete a quiz at the end of each cycle.

System Behavior:

- **Descriptive Analytics**:
    - Track the number of Pomodoro cycles completed per module.
    - Record time spent and productivity per session.
    - Measure quiz performance after study cycles.

- **Prescriptive Analytics**:
    - Suggest optimal session lengths based on past focus and retention.
    - Recommend integrating retrieval practice at the end of certain cycles.
    - If productivity drops, suggest shorter bursts or technique changes.

3. Feynman Technique

Implementation:

- Ask the student to explain the topic in their own words using a textbox or voice note.
- Allow them to re-read the material after submitting to fill knowledge gaps.
- Offer prompts like: “Explain this topic as if teaching a beginner.”

System Behavior:

- **Descriptive Analytics**:
  - Save responses for review.
  - Use Gemini to analyze clarity and completeness of the explanation.
  - Track which concepts are poorly explained.

- **Prescriptive Analytics**:
  - Recommend targeted study materials for unclear concepts.
  - Suggest follow-up Active Recall or Retrieval Practice sessions.
  - If explanation quality improves, schedule less frequent Feynman checks.

4. Retrieval Practice

Implementation:

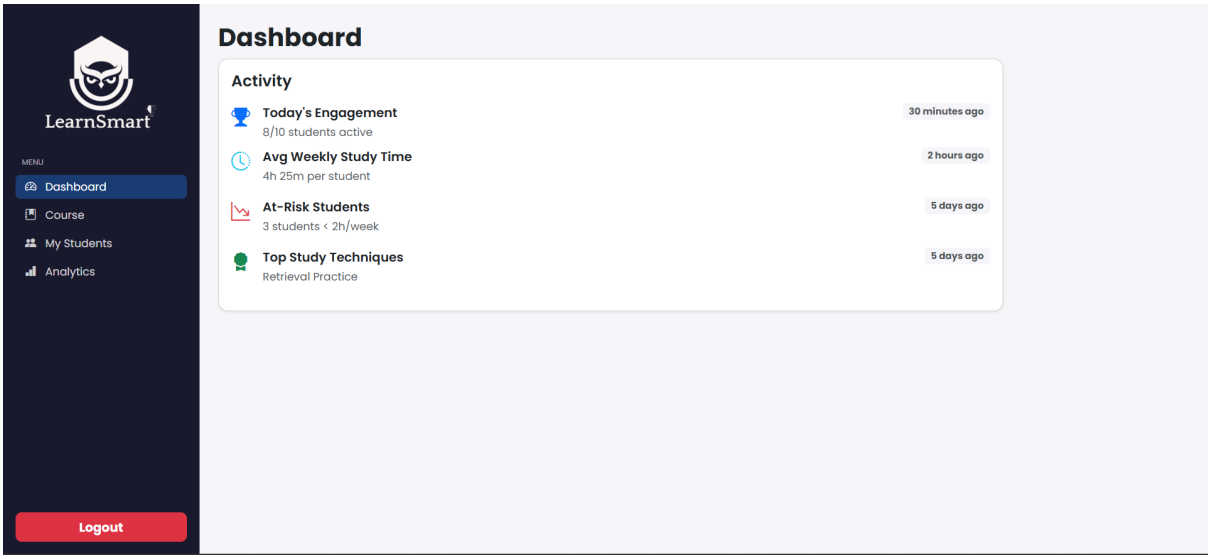
- Provide short quizzes or open-ended questions immediately after reading material.
- Require students to answer without notes.
- Randomize or vary question formats for each attempt.

System Behavior:

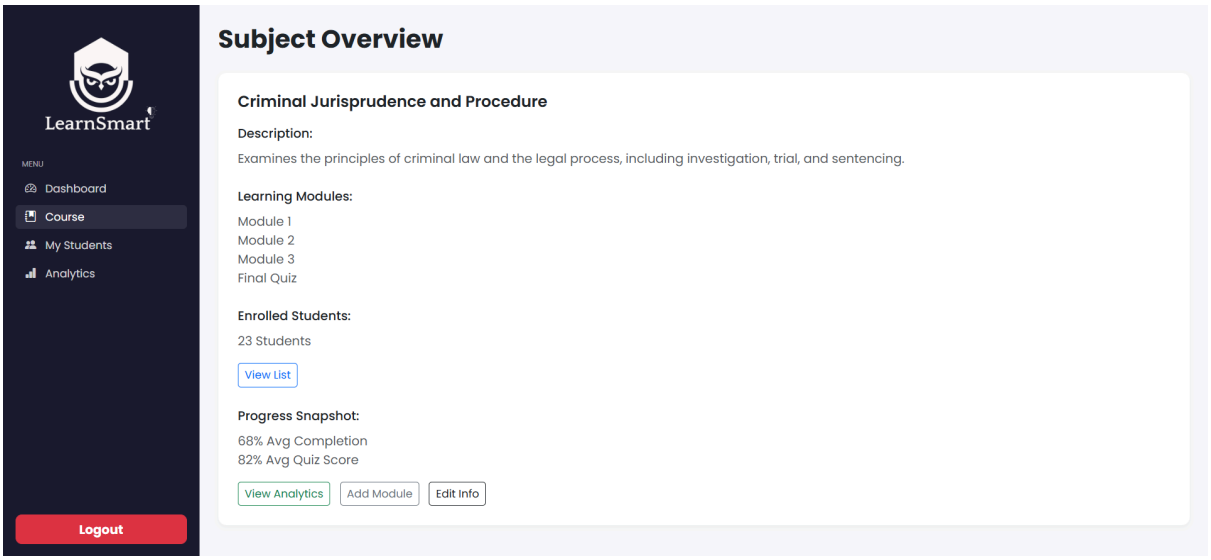
- **Descriptive Analytics**:
  - Measure performance on retrieval vs. recognition questions.
  - Compare current attempt scores to past attempts.
  - Track which question types yield the best retention.

- **Prescriptive Analytics**:
  - Recommend increasing retrieval practice frequency for weak topics.
  - Suggest alternating with Active Recall for reinforcement.
  - Adjust difficulty mix based on improvement trends.

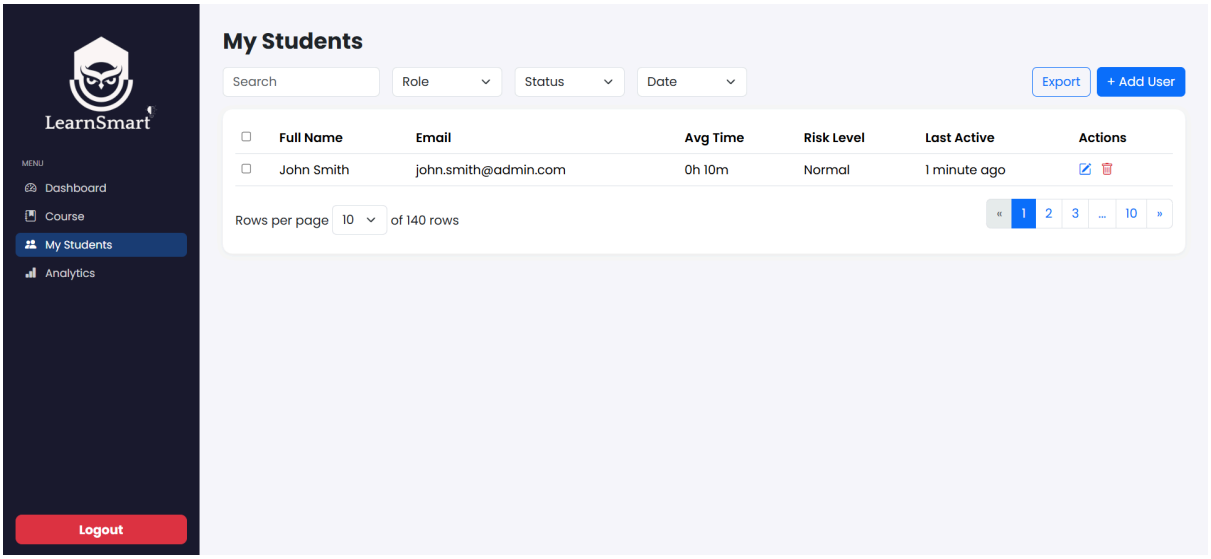
Web Screens
Instructor Side



Dashboard
Provides an overview of the instructor's assigned course, including student progress, upcoming quizzes, and recent activity. Displays quick statistics such as average scores, most-missed and low score topics. AI insights highlight at-risk students or topics needing reinforcement.

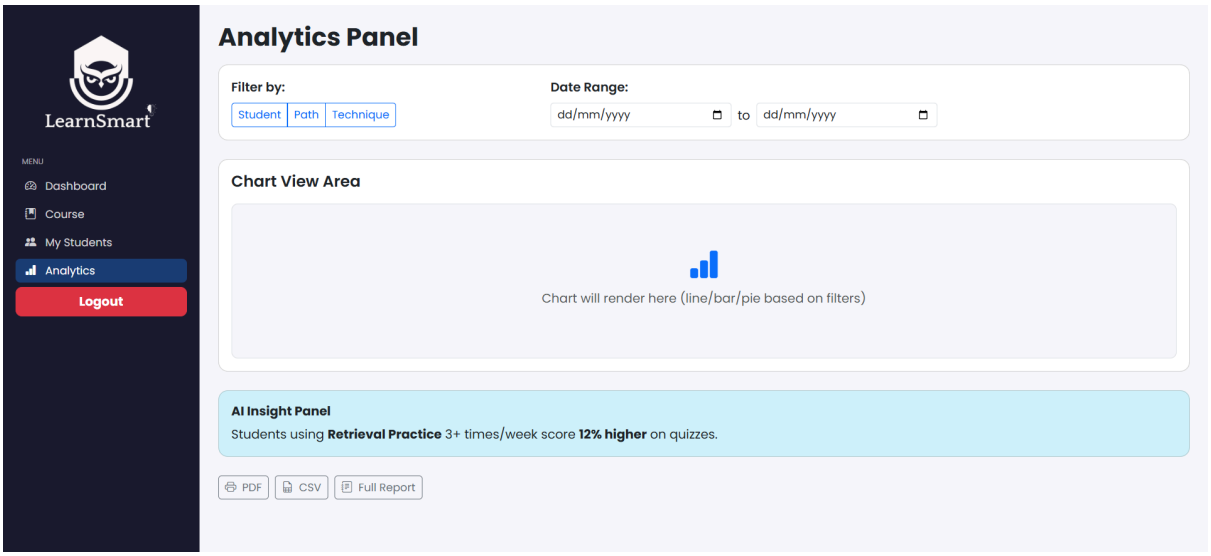


Course
Contains all learning materials, quizzes, and assessments for the instructor's specific course. Instructors can upload, edit, or organize modules and use the AI (Gemini) to generate quizzes from uploaded content. Ensures module content is aligned with review schedules.



Student Management

Lists all students under the instructor's course with individual progress and performance tracking. Displays study technique usage and performance trends. Supports targeted feedback and intervention for struggling learners.

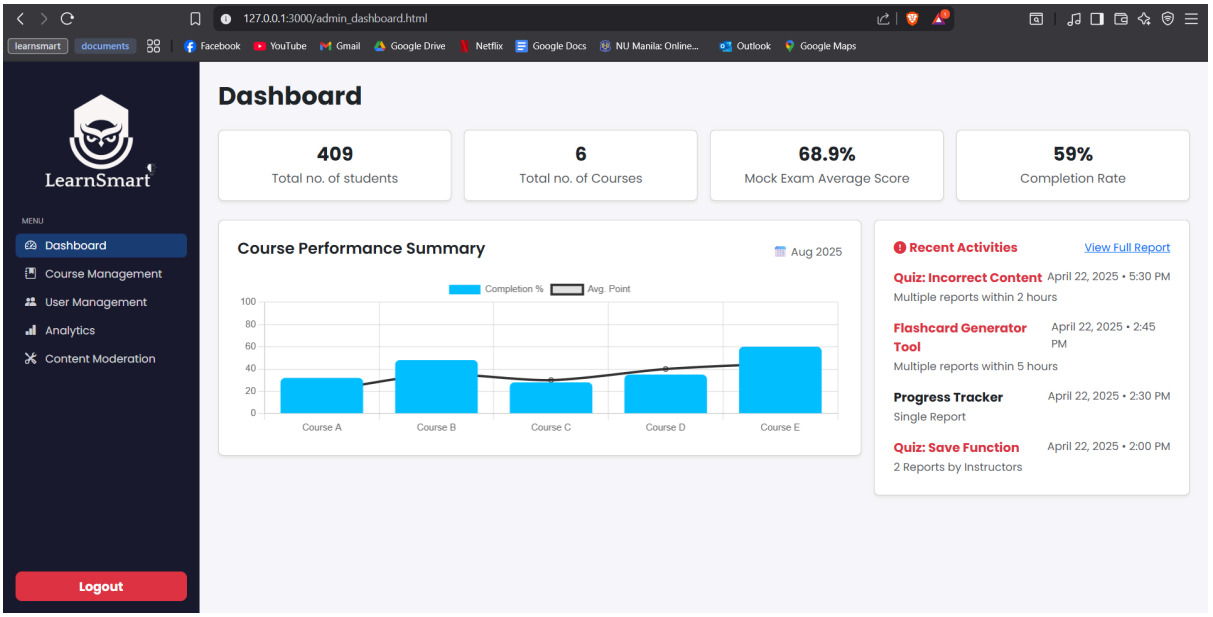


Analytics (AI Insights)

Presents class-wide performance trends, most effective study techniques, and topic mastery. AI insights provide data-driven recommendations, such as suggesting a switch in technique for students struggling in specific topics.

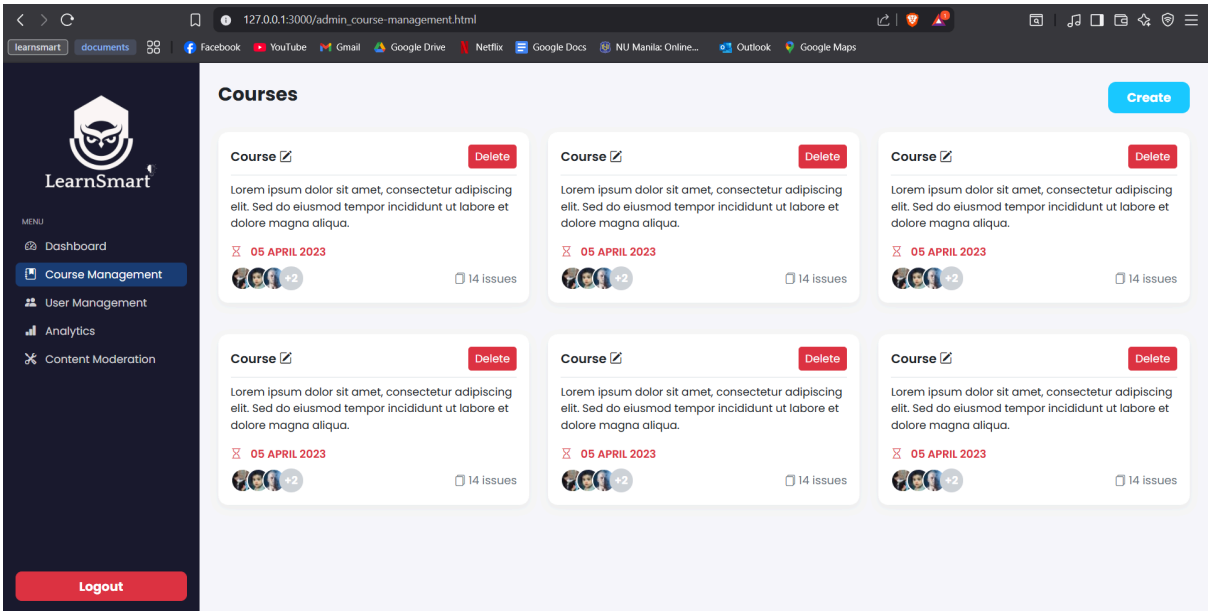
Admin Side

(Note: remove content moderation)



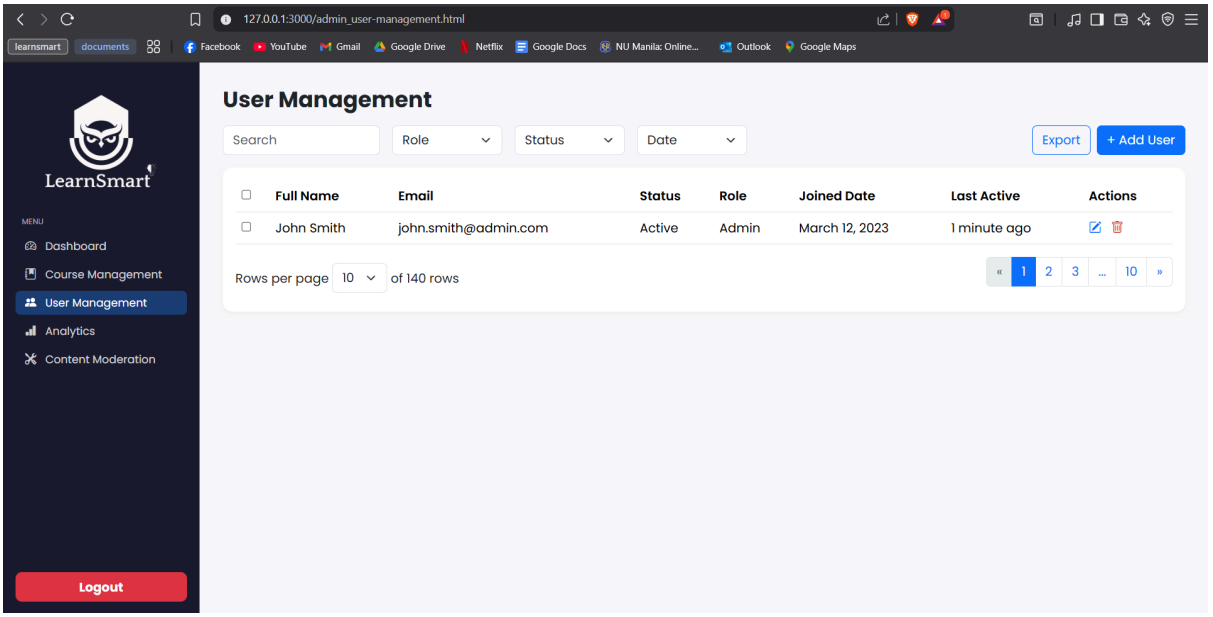
Dashboard

Displays a centralized overview of the platform's usage, including total students, pass rates, and engagement trends. Offers a snapshot of active modules, instructor activity, and system-wide performance.



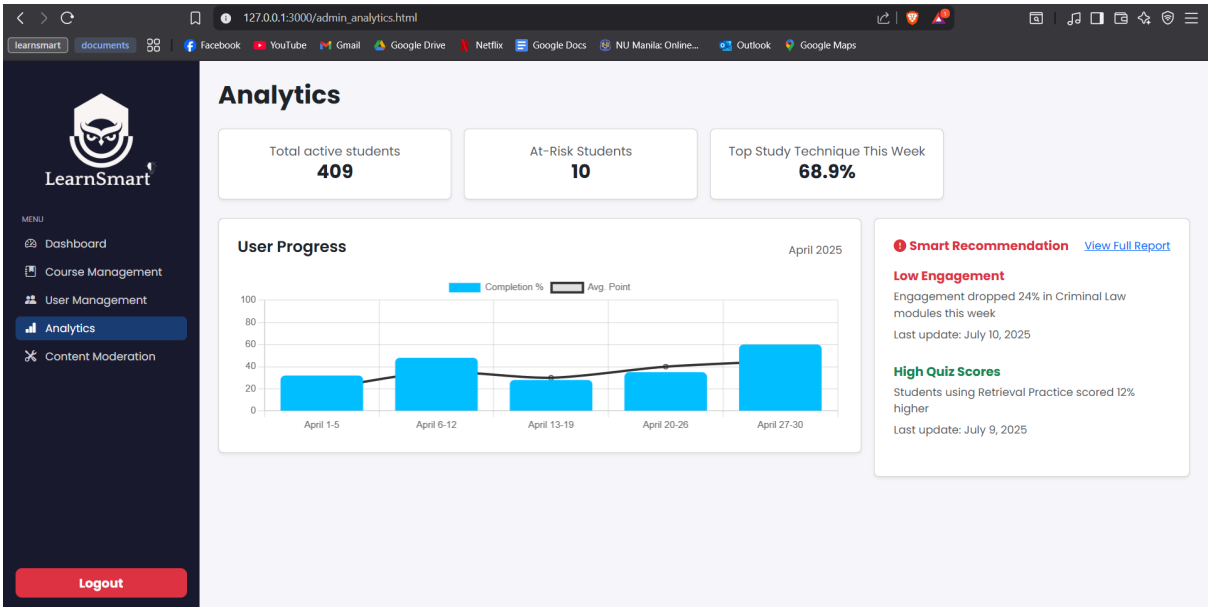
Course Management

Allows the creation, and editing of courses. Enables administrators to manage module availability, maintain consistency across subjects, and assign instructors.



User Management

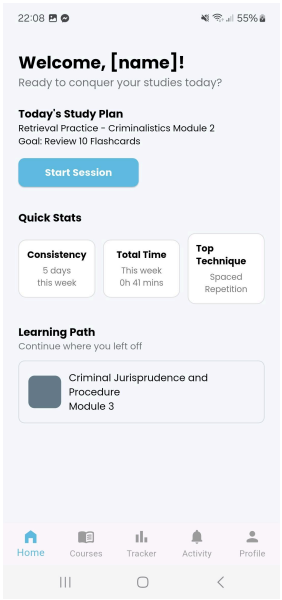
Manages accounts for both instructors and students. Handles account creation, role assignments, permissions, and enrollment updates.



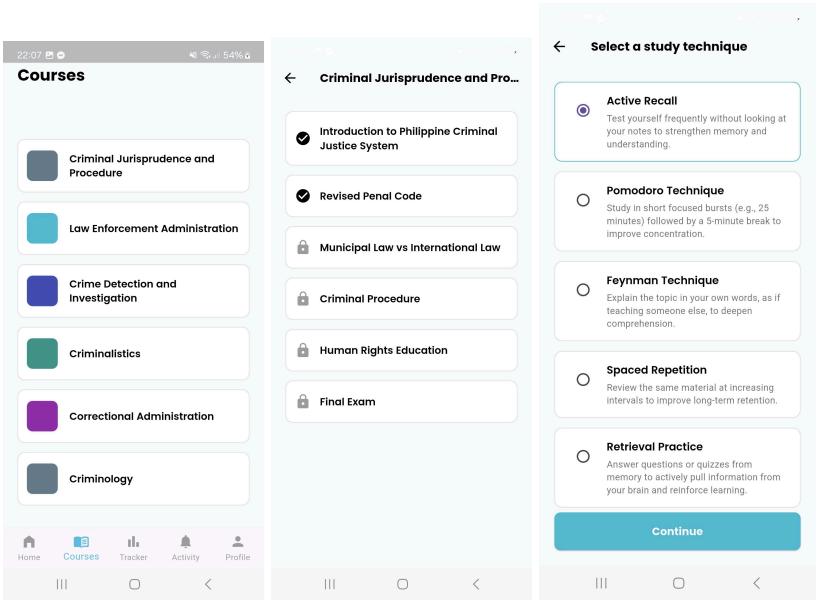
Analytics (AI Insights)

Aggregates performance metrics across all courses. AI insights identify trends such as high-performing study techniques and common weak topics, helping the review center adjust teaching strategies.

Mobile Screen



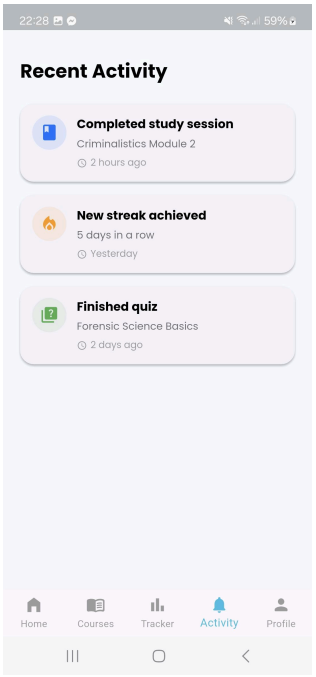
Home
Provides a quick snapshot of ongoing modules, upcoming quizzes, and AI-recommended activities. Keeps students updated on deadlines and upcoming study sessions.



Modules
Displays all enrolled modules. When a student selects a module, they are prompted to choose a study technique before beginning. If the student fails the quiz, the system generates a remedial quiz with adjusted difficulty and targeted review.

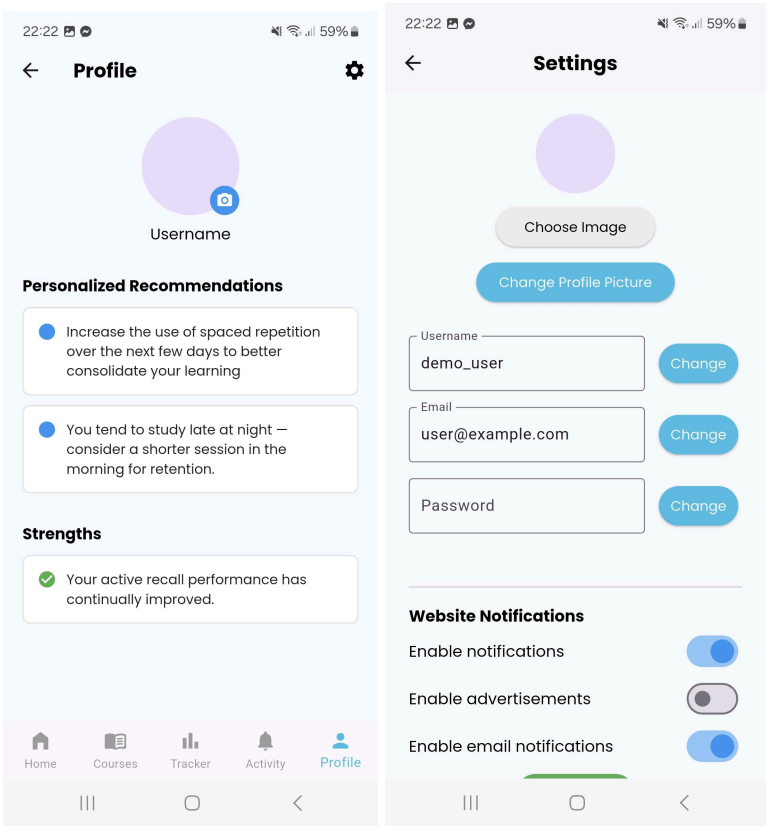
Tracker

Shows a visual pie chart of study technique usage, with clickable sections that display performance details for each technique. Encourages reflection on learning habits and suggests improvements based on AI insights.



Activities

Lists completed quizzes, modules, and study sessions in chronological order. Acts as a personal learning history to track progress over time.



Profile

Displays personalized recommendations, identified strengths, and areas for improvement. AI insights provide guidance such as recommending specific techniques for certain modules based on past performance trends.