TASK 10.1D

GitHub Repo: https://github.com/jessmoogs/Task_10.1D

Demo Video: https://youtu.be/rRtdIVgvBnU

# Report: Personalised Learning Experience App

## Overview

The *Personalised Learning Experience App* is an educational Android application designed to provide users with a tailored quiz experience based on their interests in IT. The app follows a clear, structured user journey — from account creation to interest selection, interactive task completion, and a detailed progress history — all while adhering to modern Android development standards. With the integration of Room for persistent data, SharedPreferences for lightweight storage, and intuitive UI/UX design, the app ensures an accessible, efficient, and rewarding learning experience.

## Key Features and Functionality

The app's core functionality is structured around a set of interactive screens and logic-driven components, developed to enhance usability and modularity:

- **User Authentication**: New users sign up by entering their name, contact information, and interests. Returning users log in with credentials that are securely stored in a local Room database.
- **Interest Selection**: Users choose up to 10 topics via a dynamically generated GridLayout, where buttons are sized consistently for a polished look. Selections are stored using Room and persisted across sessions.
- **Dynamic Quiz Generation**: Based on selected interests, the app generates six questions per topic using a dummy dataset or an LLM backend. Each quiz appears one question at a time, promoting focus and clarity.
- **Result Summary & Feedback**: After each quiz, users receive a summary view with detailed feedback on correct/incorrect answers, fostering self-assessment and growth.
- **Visual Task Feedback**: Completed tasks are shown with a disabled greyed-out "Completed" button and a replay icon for reattempting quizzes. Task state is saved with SharedPreferences to persist even after app closure.
- **History Screen**: Quiz attempts are grouped by date and displayed in collapsible cards. Each expandable section shows every question, the user's response, and correctness indicators. A "Delete History" option allows clearing all data after password confirmation.
- **Profile Page**: Displays user name, contact info, and current plan. The plan defaults to "Free" and can be upgraded.

- **In-App Purchase Simulation**: The Upgrade screen includes a custom-styled bottom sheet that mimics a Google Pay purchase flow, updating the user's plan post-confirmation.

- **Logout Functionality**: A link-styled "Logout" option at the bottom of the profile page prompts a confirmation alert before returning the user to the login screen.

These features collectively reflect a cohesive application that not only supports personalisation but also encourages continuous engagement and progress tracking.

## Modern Android Development Practices

This app adheres closely to recommended practices in Android development, particularly in terms of architecture, data handling, and UI design:

### *MVVM Architecture*

The app follows the Model-View-ViewModel (MVVM) design pattern, which separates the business logic from the UI. As Netguru (Zych, 2025) notes, "MVVM promotes separation of concerns by isolating the user interface logic from the business logic. It makes the code more readable, modular, and easier to debug." This architecture ensures that each component (data, UI, logic) remains cleanly structured and independently testable.

### *Room Persistence Library*

User data and quiz history are managed using Room, which abstracts SQLite while offering compile-time validation of SQL queries and streamlined migration paths. As stated in Android Developers (2025), "Room provides an abstraction layer over SQLite... and ensures compile-time verification of SQL queries." This implementation guarantees data integrity and simplifies CRUD operations through DAOs (Data Access Objects).

### *SharedPreferences for Lightweight Storage*

The app uses SharedPreferences to store minor UI state flags, such as task completion. According to Alooba (2025), SharedPreferences is best suited for "remembering user choices... even after the app is closed," and provides a lightweight, persistent mechanism to preserve settings and small data elements without the overhead of database access.

### *Responsive UI and Material Design*

The app uses responsive layouts including GridLayout, ScrollView, and material components like buttons and bottom sheets. Buttons auto-size and wrap text while maintaining visual uniformity across devices. The result is a clean and professional UI that supports accessibility and consistency.

## Integration and Future Use of LLMs

Currently, the app can generate quiz questions using a dummy dataset or integrate with a backend that serves LLM-generated content. Expanding this integration with Large Language Models (LLMs) like GPT or LLaMA provides several powerful opportunities:

- **Dynamic Quiz Creation:** LLMs can generate varied and up-to-date quiz content tailored to current trends, improving relevance and engagement.

- **Explanatory Feedback:** Instead of simply marking answers correct or incorrect, LLMs can explain why a certain answer is right, aiding comprehension.

- **Adaptive Difficulty:** Based on user performance, LLMs can generate questions of varying difficulty levels, promoting progressive learning.

- **Natural Language Help:** Incorporating a chatbot or voice assistant powered by an LLM could help users navigate the app or request explanations for quiz topics.

By integrating LLMs more deeply, the app could move beyond a static experience and into a dynamic, adaptive learning environment that evolves with the user.

## Conclusion

The Personalised Learning Experience App delivers an engaging, structured, and modular learning platform grounded in modern Android development practices. With support for offline access, clean architecture, persistent state handling, and intuitive design, the app sets a strong foundation for scalable educational technology. Future enhancements powered by LLMs could further personalise and enrich the learning experience, making this app both a robust prototype and a vision of what Android-based learning can become.

## References


- Android Developers (2025) *Save data in a local database using Room*. Available at: https://developer.android.com/training/data-storage/room (Accessed: 29 May 2025).

- SharedPreferences: Everything You Need to Know When Assessing SharedPreferences Skills (2025). Available at: https://www.alooba.com/skills/tools/data-persistence-578/sharedpreferences/ (Accessed: 27 May 2025).

- Zych, F. (2025) *Getting to grips with MVVM architecture*. Digital Acceleration Company. Available at: https://www.netguru.com/blog/mvvm-architecture (Accessed: 27 May 2025).