**BSc Project Screening Form: Guidelines**

**Part 1 – Project Proposal**

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| **Student Name** | Resh Dewan Rai | |
| **Student Number** | 2325678 | |
| **Degree Pathway** | BSc (Hons) Software Engineering | |
| **Supervisor Name** | Pawan Kc | |
| **Title of Project** | Study Mate – AI-Powered Personal Study Assistant | |
| **Abstract of the project** | In the modern educational environment, most of the learners, me included, cannot afford a steady and stable studying process and determine the aspects they should pay attention to. To address this issue, I am designing Study Mate, an AI-powered mobile app that will serve as a virtual study assistant. The app allows the students to study in a more effective way because it allows making quizzes of their notes with the help of a custom NLP model and to change the study schedules with references to the results of quizzes. This flexible methodology will make the learners devote more time to work on their weak areas. It has automatic goal tracking which updates with progress without the need of being manually entered and intelligent reminders to keep students on track and motivated. The app is created based on Flutter to achieve the cross-platform experience, Spring Boot to manage the backend, and custom NLP model to implement AI. Study Mate is more efficient in learning by integrating adaptive learning, intelligent planning, and automation to formulate smarter and self-directed learning habits in students. | |
| **Project deliverables** | * Android and iOS mobile application. * Project Documentation * Final project report | |
| **Problem Statement** | As a student, there have been frequent times when I failed to have a consistent studying pattern and understand which subjects I need to work harder on. The results are not always proportional to the hours spent with studying, which is partly because the methods of studying usually fail to support my personal learning style and monitor the progress of learning in the right direction. It is found out that study habits are related to poor academic performance- students who are unable to control studying and adapt to the learning requirements perform worse (Dagoc, 2024; Poudel, 2023). In the meantime, adaptive education with the use of artificial intelligence is promising in adjusting the learning process to the needs and pace of the individual student (Hariyanto, 2025; Gupta, 2024). Nevertheless, the existing instruments continue to be based on manual tracking, fixed schedules, and standardized quizzes, not the real personalized, automated assistance (Ardana, 2024). This absence of an AI-based study assistant a study assistant that automatically produces quizzes, modifies study schedules, goals and progress tracking that does not need manual intervention would result in a gap that my project would fill. | |
| **Description of your artefact** | The system is a smart study assistant based on AI which is aimed at assisting users manage tasks, create quizzes, and schedule their time effectively. It employed a Priority-based Greedy Algorithm in its schedule making feature to make sure that more important or those with shorter deadlines are given priority to complete their task first to manage the time. Moreover, it incorporates a tailored NLP model to produce quizzes and smart tasks recommendations using Spring Boot microservices (Jani, 2020), which link the primary backend to the Python-based NLP service. This solution will guarantee modularity, scalability, and effective communication among modules and achieve a customized and effective study experience.  Aim:   * To create an AI-powered mobile platform that helps students to study effectively based on adaptive learning, intelligent creation of quiz, and automatic monitoring of their progress.   Objectives:   * Build an AI quiz generator on a self-written NLP model. * Create an adaptive study planner using results of quiz. * Allow automatic goal recording and progressing to be done automatically.   Added Value   * Removes manual tracking - the AI automatically handles schedules of the studies. * Delivers individual learning recommendations to every student. * Promotes accountability, motivation and consistency. * Combines adaptive learning, analytics and notifications.   Features   * AI Quiz Generator: Assists students in the assessment of knowledge in real-time by creating quizzes based on the study materials uploaded on the application and implemented through NLP. * Adaptive Study Planner: Enhances the efficiency of studies: It will automatically change the schedules according to quiz scores and areas of weakness. * Full Automated Progress Tracking: Eliminates human interaction as AI helps to track the done or missed study assignments. * Goal Tracking System: Maintains focus of learners as goals are automatically updated as milestones are reached in their study plan. * Smart Reminders and Notifications: Increases consistency and motivation, sending personalized alerts about tasks to be done and those that were missed. * Performance Analytics Dashboard: Helps in self-improvement that illustrates the progress, strengths, and areas that require more attention. * Cross-Platform Use: Means it is convenient and accessible, as it does not make smooth learning easier with both Android and iOS. | |
| **Risk Analysis** | | **SN** | **Risk Description** | **Impact** | **Mitigation Strategy** | | --- | --- | --- | --- | | 1 | Delay in training or integrating NLP model due to limited dataset availability. | High | Use pre-trained NLP models initially (e.g., BERT) and fine-tune later when more data is collected. | | 2 | Incompatibility between Spring Boot (Java) and NLP microservice (Python). | High | Implement RESTful API-based communication and containerize both services using Docker for smoother integration. | | 3 | Performance issues on low-end devices when running Flutter app. | Medium | Optimize Flutter UI, use lazy loading for large data, and test across multiple device configurations. | | 4 | Data privacy and security risks when handling user study data. | Medium | Encrypt stored data, apply Firebase Authentication, and follow GDPR/FERPA compliance guidelines. | | |
| **How does your project relate to your degree course and build upon the units/knowledge you have studied/acquired** | * The current project perfectly corresponds to the courses studied in Software Engineering, Artificial Intelligence, Object-Oriented Programming , Mobile App Development, and Database Systems. It uses coursework experience to develop an actual AI-based learning application, with Python to develop NLP models and to do AI/ML tasks, Java and Spring boot to develop a backend and API, and Flutter to design a cross-platform mobile UI/UX interface. The Object-Oriented Programming (OOP), the use of the RESTful API of the communication between the frontend and NLP microservices, and the architecture and model design of AI to generate quizzes and plan the study adaptively are all implemented in the project. Data structure, algorithm, and database management knowledge is used in providing the adaptive scheduling algorithm and managing user data effectively and safely. This combination of various coursework skills makes it possible to create the useful, smart, and engaging educational app. | |
| **Resources required in developing the artefact** | Hardware:   * Intel Intel Core i5 processor, gen 11 at least Laptop/PC. * Minimum 8GB RAM * 256GB or higher SSD storage * App testing emulator or test device Android.   Software:   * Flutter Cross-platform development mobile SDK. * Android Studio frontend design and test. * The IntelliJ IDEA Spring Boot backend development. * Postman to validate and test API. * Database and authentication services on firebase. * Spring Boot as the backend management and API integration. | |
| **Have you completed & submitted your ethics form?** | YES | NO |
| **If the project is a development of previous work by yourself or others, give details below. Failing to declare such previous work here may be treated as an academic offence** | | |

**Supervisor Signature:**

**After the proposal has been signed off by both the supervisor and course coordinator scan the proposal and upload on BREO with signatures. Projects that follow proposals that have not been approved may be cancelled and there will be no compensation for any time lost**

**Part 2 – List of relevant resources**

**Fill in this section after your project proposal has been approved by your supervisor. Use Harvard referencing (see https://lrweb.beds.ac.uk/a-guide-to-referencing). Modify the list below as appropriate. This list is part of Assignment 1 and will be submitted with the Project Proposal.**

**Journal Article**

* **Ardana, N. B., Hastomo, W., & Arman, S. A. (2024).** *Development of Adaptive Lecture Scheduling System using Genetic Algorithm (Case Study: Ahmad Dahlan Institute of Technology and Business).*
* **Jani, Y. (2020).** *Spring Boot for Microservices: Patterns, Challenges, and Best Practices.*
* **Ingole, A. A., & Karale, N. E. (2025).** *Java in Microservices Architecture: A Study on Spring Boot and Cloud-Native Development.*
* Dagoc, R. P. &. O. R. M., 2024. Pupils’ study habits and academic performance.. *International Journal of Multidisciplinary Research and Analysis, 7(3).*
* Gupta, T. K. A. R. B. K. &. S. S., 2024. Adaptive learning systems: Harnessing AI to personalize educational outcomes.. *Journal for Research in Applied Science & Engineering Technology (IJRASET)..*
* Hariyanto, K. F. X. D. &. M. R., 2025. Artificial intelligence in adaptive education: A systematic review of techniques for personalized learning.. *Discover Education, 4, 458.*
* Poudel, T. N., 2023. Relationship between study habits and achievements of grade ten students in Nepal. *Journal of Advanced Academic Research, 3(3).*

**Book**

* **Niemi, H., Pea, R. D., & Lu, Y. (Eds.) (2023).** *AI in Learning: Designing the Future.* Springer.

# References

Ardana, N. B. H. W. &. A. S. A., 2024. Development of Adaptive Lecture Scheduling System using Genetic Algorithm (Case Study: Ahmad Dahlan Institute of Technology and Business). *Journal of Computer Science Advancements,* p. 200–212.

Dagoc, R. P. &. O. R. M., 2024. Pupils’ study habits and academic performance.. *International Journal of Multidisciplinary Research and Analysis, 7(3).*

Gupta, T. K. A. R. B. K. &. S. S., 2024. Adaptive learning systems: Harnessing AI to personalize educational outcomes.. *Journal for Research in Applied Science & Engineering Technology (IJRASET)..*

Hariyanto, K. F. X. D. &. M. R., 2025. Artificial intelligence in adaptive education: A systematic review of techniques for personalized learning.. *Discover Education, 4, 458.*

Jani, Y., 2020. *Spring Boot for Microservices: Patterns, Challenges, and Best Practices.*

Poudel, T. N., 2023. Relationship between study habits and achievements of grade ten students in Nepal. *Journal of Advanced Academic Research, 3(3).*