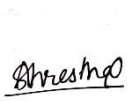
TAYLOR' S UNIVERSITY
Wisdom • Integrity • Excellence

Bachelor of Computer Science (Hons)

Module Code: ITS66704 (April 2024)
Module Name: Advanced Programming

Assignment No./Title	Assignment Task 2 & Task 3 (Group Project) 20% (PART A - ANALYSIS AND DESIGN) 30% (PART B - DEVELOPMENT) 10% (PRESENTATION)
Course Tutor/Lecturer	Mr. Subit Timalsina
Submission Date	Week 09: TBA (PART A - ANALYSIS AND DESIGN) Week 12: TBA (PART B - DEVELOPMENT) Week 13: TBA (PRESENTATION)

Student Name	**Student ID**	**Student Signature**
Prabin Joshi	0358667	
Sushil Kumar Thakur	0358230	
Aayushma Shrestha	0358270	
Lina Maharjan	0358308	
Ravi Prasad Kanu	0358238	

Declaration *(need to be signed by students. Otherwise, the assessment will not be evaluated)*

Certify that this assignment is entirely my own work, except where I have given fully documented references to the work of others, and that the material contained in this assignment has not previously been submitted for assessment in any other formal course of study.

Marks/Grade:	**Evaluated By:**
Evaluator's Comments:	

Marking Rubrics

MARKING RUBRICS

For EACH criterion of marks allocated, the following rubrics will be applied:

100% of allocated marks	75% of allocated marks	50% of allocated marks	25% allocated marks	0% allocated marks
• Complete understanding of the problem • A plan that could lead to a correct solution with no algorithmic errors. • Correct solution	• Misinterprets minor part of the problem. • Substantially correct solution with minor omission or procedural error	• Misinterprets major part of the problem. • Partially correct solution but with major fault • Computational error, partial solution for problem.	• Completely misinterprets the problem. • Substantially inappropriate solution	• No attempt • No answer or wrong answer based upon an inappropriate solution

Contents

List of Figures

Works Responsibilities and Delegation

Roles of Group Members	**Responsibilities**
Project Manager and Use Case Diagram Designer - **Prabin Joshi**	As the project manager and case designer, I (group leader) am essential in supervising the project as a whole. My duties include supervising the team's coordination of tasks, guaranteeing effective communication, and managing the project's resources and schedule to keep it on schedule. I am also tasked with identifying potential risks and devising strategies to mitigate them, ensuring that the project progresses smoothly. In my role as the use case designer, I works closely with stakeholders to gather and document functional requirements, translating them into detailed use cases. These use cases include actors, scenarios, propositions, and posterior formulations, providing a clear blueprint for the functionalities of the system. Furthermore, I creates the use case diagram, which visually represents the interactions between actors and the system and is essential for directing the development process.
UI Designer and Class Diagram – **Lina Maharjan and Aayushma Shrestha**	Lina and Aayushma share the responsibility of designing the user interface (UI) for the Education Feedback System. They work together to create UI static prototypes in the figma for the various forms required, including the Admin Form, Survey Creator Form, Survey Form, and Questions Form. Their goal is to ensure a consistent and user-friendly interface across all forms and sub-forms, enhancing the overall user experience. Their work ensures that users can interact with the system seamlessly, which is vital for the system's success. In addition to their roles as UI designers, Lina and Aayushma are also responsible for creating the UML class diagrams.

	They identify the primary classes and their relationships based on the use cases and requirements gathered by me. Lina and Aayushma define the attributes and methods for each class, ensuring proper encapsulation and modularity. They create the UML class diagram, which graphically depicts the structure and relationships among classes. The development team uses this diagram as a blueprint to guide the system's implementation. Their efforts guarantee a well-structured and logically organized system, facilitating efficient and effective development.
Question Manager - **Sushil Kumar Thakur**	Sushil is tasked with managing the question modules for multiple-choice questions (MCQ), polar questions, and open-ended questions. Sushil will ensure that each question type is accurately represented and functional within the system. These different question formats are essential for capturing a wide range of feedback from users. MCQs allow for quick and quantifiable responses, making it easy to analyze trends and common opinions. Polar questions provide straightforward, binary feedback that is useful for assessing clear-cut preferences or opinions. Open-ended questions enable respondents to express their thoughts in detail, offering deep insights and qualitative data that can uncover nuanced perspectives. Sushil's expertise in handling these question types ensures that the survey system can gather comprehensive and meaningful feedback.
Report Writing - **Rawi Prasad Kanu**	Compiling and writing the project report, which covers every aspect of the Education Feedback System is the task of Rawi. He collects data and insights from every team member, guaranteeing that every segment of the report is

	comprehensive and accurate. In a logical and coherent structure, Rawi organizes the response, including all the topics that are crucial for response. Through comprehensive proofreading, he guarantees that the report satisfies academic standards and is error-free. The report presents an account of the project's progress and accomplishments, highlighting the team's efforts. Rawi's meticulous efforts guarantee that the report effectively conveys the project's outcomes and approaches, which is essential for academic evaluation.
Overall Documentation of Report - **Rawi and Sushil**	Rawi and Sushil will collaborate on the overall documentation of the report. This includes compiling and organizing all written materials, ensuring consistency and completeness across all sections. They will verify that the documentation accurately reflects the system's design and functionalities.

Introduction

In the quickly changing Nepali landscape of today, precise, real-time data collecting is critical. Particularly in the field of education, having a thorough grasp of the viewpoints of educators, students, and other stakeholders via an effective survey system can help make more informed judgements. With an emphasis on the Education Feedback System, the goal of this project is to create a Survey Management System specifically suited for the Nepalese environment. Object-oriented design principles will be used in the system's construction to guarantee security, flexibility, and dependability.

Background of Education System in Nepal

Over the last several decades, Nepal's education system has seen substantial changes, moving from conventional, exclusive teaching techniques to more contemporary, inclusive, and technologically advanced ones. Due to the population's varied cultural and socioeconomic backgrounds, the educational system has both special obstacles and opportunities. In order to successfully

understand and meet the requirements of educators and students, it is becoming more and more important to incorporate digital tools for evaluation and feedback.

Problems with resource allocation, educational quality, and accessibility persist despite progress. A well - structured feedback system can provide insightful information to help stakeholders make data-driven decisions that improve student outcomes. These needs will be satisfied by the suggested survey system, which provides a framework for careful data collecting and analysis.

Mission of the Project

To create a secure, efficient, and culturally relevant survey management system that empowers educational institutions in Nepal to gather actionable insights and drive continuous improvement.

Vision of the Project

To enhance the educational experience in Nepal through a feedback system that is accessible, reliable, and reflective of the needs and preferences of students and educators.

Objectives of the Project

- Develop a user-friendly survey management system tailored for the Nepalese educational context.
- Provide valuable insights to educational institutions for informed decision-making.
- Ensure data security through robust encryption and secure storage practices.
- Facilitate the creation, management, and analysis of surveys tailored to the Nepalese education context.
- Provide a flexible platform that supports various question types and survey formats.
- Enable comprehensive CRUD operations for surveys and user accounts.

Brief Description of System with Data and Preprocessing Steps

The Education Feedback System is designed to collect and analyze feedback from various stakeholders in the educational sector. It ensures secure data collection, flexible survey creation, and comprehensive reporting. The system includes modules for administrators, survey creators, and respondents, with features such as robust data encryption, and user-friendly interfaces.

Data and Processing Steps:

- **Admin Module:** The Admin module is pivotal in maintaining the overall system's integrity and security. Key data elements for the admin include a username and an encrypted password, ensuring that access to the system is secure and restricted to authorized personnel only. The processes in this module begin with registration, where an admin creates an account with secure credentials. The login process involves validating these credentials against stored encrypted data. The administrator can manage survey creators after they log in by creating new accounts, updating old ones, or removing them when necessary. This guarantees that only those with high quality can create management surveys. Viewing survey results is another critical function, allowing the admin to analyze feedback and make informed decisions to improve the system and its processes.

- **Survey Creator Module:** The Survey Creator module caters to individuals responsible for designing and managing surveys. The data captured for each survey creator includes a unique Survey Creator ID (SCId), username, encrypted password, and personal details such as first name, last name, faculty, email address, gender, and phone number. Survey creators first register by providing their personal information and setting a password, which is encrypted and stored securely. Upon logging in, they can create new surveys by entering the survey title and other relevant details, each survey being assigned a unique ID for identification. They can also update or delete existing surveys, ensuring that the survey content remains relevant and accurate. Additionally, survey creators are responsible for managing the questions within their surveys, adding new questions, and making necessary adjustments to ensure that the survey effectively gathers the intended feedback.

- **Survey Module:** The Survey module is focused on the lifecycle management of surveys. It handles data such as the SurveyId, survey title, SCId (linking to the survey creator), and the creator's name. When creating a survey, the survey creator inputs these details, which are stored and managed by the system. This module supports the creation, updating, and deletion of surveys, providing flexibility to adapt to changing needs and objectives. The module also allows for the addition and removal of questions within surveys, enabling survey creators to tailor their surveys precisely to their target audience and goals.

- **Questions Module:** The Question module is essential for managing individual survey questions. Data fields include QuestionId, question position, question text, SurveyId (linking the question to a specific survey), question type (such as MCQ, polar, and open-ended), and options for multiple-choice questions. This module supports displaying, retrieving, adding, updating, and deleting questions. Survey creators can use these functionalities to construct surveys that accurately capture the required feedback. Adding new questions involves specifying the question type and any options for MCQs, while updates might change the question text or options. Deleting questions removes them from the survey, maintaining relevance and clarity. This structured management ensures that each question contributes effectively to the survey's objectives.

- **Participant Module:** The Participant module manages the individuals who take the surveys, ensuring their data is securely handled. Key data points include participantID, username, password (encrypted), first name, last name, gender, and email. Participants must register by providing this information, creating a secure account with an encrypted password. Upon logging in, participants can access available surveys, respond to questions, and submit their completed surveys. Their responses are stored and linked to their unique participantID for tracking and analysis. Participants can also view their submitted responses, providing transparency and allowing them to review their feedback. This module ensures a seamless and secure experience for participants, promoting high response rates and reliable data collection.

Chosen Survey Options

Polar, open-ended, and multiple choice (MCQ) questions are among the survey options that have been selected. These forms are justified by the fact that they can record both qualitative and quantitative data, which is necessary for comprehensive evaluations of education.

- **MCQ Questions:**

  Which area of Nepal's educational system needs the most development, in your opinion?

  A. Classrooms
  B. Laboratories
  C. Libraries
  D. Sports Facilities

E. Sanitation Facilities

What kind of learning approach do you think is best suited for the students in Nepal?

A. Teacher-centered (lectures)
B. Student-centered (interactive learning)
C. Project-based learning
D. Blended learning
E. practicals/experiential learning

Overall, how do you rate the quality of teaching in schools, colleges and universities in Nepal?

A. Excellent
B. Good
C. Average
D. Poor
E. Very Poor

Which factor do you believe most significantly affects teaching quality in educational institutions in Nepal?

A. Teacher qualifications and training
B. Teaching methods and approaches
C. Classroom resources and technology
D. Support from administration and management

In this course, you will learn how to use digital learning tools (such as online courses and educational apps) do you think can these digital learning tools be beneficial for the students of Nepal at large?

A. Very Effective
B. Effective
C. Neutral
D. Ineffective
E. Very Ineffective

Which facility shortage do you think exists the most throughout all Nepali schools, colleges, and universities?

A. Infrastructure in the classroom (e.g., desks, chairs)
B. Laboratory equipment and resources
C. Library resources and materials
D. Sports and recreational facilities
E. Water, sanitation & hygienic facilities

How satisfied are you with the availability of teaching aids and resources [such as textbooks, multimedia tools] in educational institutions in Nepal?

A. Very Satisfied
B. Satisfied
C. Neutral
D. Dissatisfied
E. Very Dissatisfied

Which level of education do you believe requires the most improvement in terms of teaching quality and facilities in Nepal?

A. School Education
B. Higher Secondary Education
C. Undergraduate Education
D. Postgraduate Education
E. Vocational Education

→ **Polar Questions:**

Do you believe Nepal's institutions, universities, and schools are capable of providing a top-notch education?

A. Yes
B. No

Were your teacher training programs good enough to put an educator in schools as well as colleges and universities?

A. Yes

B. No

Do you think the quality of teaching overall is acceptable for schools, colleges and universities?

A. Yes

B. No

Do you think the popularity of private tutoring is a reflection of failing Govt schools and therefore even students in Pvt sec need additional help staying ahead?

A. Yes

B. No

Is the inclusion of local languages in education truly beneficial for student performance in Nepal?

A. Yes

B. No

Do you think about the current level of teacher-student interaction in all over schools/ college/university?

A. Yes

B. No

Do you perceive the school and basic facilities and quality of teaching to be available at educational institutions across regions in Nepal?

A. Yes

B. No

Are mental health support services provided sufficiently in government schools?

A. Yes

B. No

→ **Open Ended Questions:**

a. In what ways does your organization assist the teachers' professional development? Exist any projects or programmes that have had a particularly significant impact?

b. Which facilities at your school have undergone the biggest recent expansions or upgrades, and how have they affected the educational experience?
c. What part do recreational amenities, such as sports complexes and cultural centers, play in your institution's overall educational programme?
d. What obstacles must academic staff members overcome in order to uphold the institution's high standards of instruction?
e. How do academics strike a balance between the necessity for precision on the part of the curriculum and the objective of making learning interesting and approachable for all students?

Data Attributes and Methods

Here below are the data attributes and methods used in this Education Feedback System:-

1) **Class: Admin**

- ***Attributes:*** adminID: TextField, email: TextField, username: TextField, password: PasswordField
- ***Methods:*** register(): Button, login(): Button, manageSurveyAccounts(): Button, manageUsers(): Button, viewFeedback(): Button, viewSurveyResults(): Button

2) **Class: SurveyCreator**

- ***Attributes:*** SCID: TextField, username: TextField, password: PasswordField, firstName: TextField, lastName: TextField, faculty: TextField, gender: ChoiceBox<String>, email: TextField, phoneNo: TextField
- ***Methods:*** register(): Button, login(): Button, createSurvey(): Button, manageSurvey(): Button, manageQuestions(): Button, viewFeedback(): Button, viewSurveyResults(): Button

3) **Class: Survey**

- ***Attributes:*** surveyId: TextField, surveyTitle: TextField, SCID: TextField, creatorName: TextField

- ***Methods:*** getSurveyTitle(): Button, createSurvey(): Button, updateSurvey(): Button, deleteSurvey(): Button, addQuestions(): Button, removeQuestions(): Button

4) Class: Question

- ***Attributes:*** questionId: TextField, questionPosition: TextField, questionText: TextArea, surveyId: TextField
- ***Methods:*** addQuestion(): Button, updateQuestion(): Button, deleteQuestion(): Button, displayQuestion(): Button

5) SubClasses of Question

➔ **MCQ**

- ***Attributes:*** answerChoice: ListView<String> or ComboBox<String>
- ***Methods***: changeChoice(): Button

➔ **Polar**

- ***Attributes:*** answerChoice: ToggleGroup with RadioButton
- ***Methods:*** changeChoice(): Button

➔ **OpenEnded**

- ***Attributes:*** answerText: TextArea
- ***Methods:*** setAnswer(): Button, getAnswer(): Button

6) Class: Participant

- ***Attributes:*** participantId: TextField, username: TextField, password: PasswordField, firstName: TextField, lastName: TextField, gender: ChoiceBox<String>, email: TextField, faculty: TextField, phoneNo: TextField

- ***Methods:*** login(): Button, register(): Button, takeSurvey(): Button, submitSurvey(): Button, addFeedback(): Button, viewSurveyConfirmationMessage(): Button

UML Use Case Diagram

Below is the use case diagram of Education Feedback System:

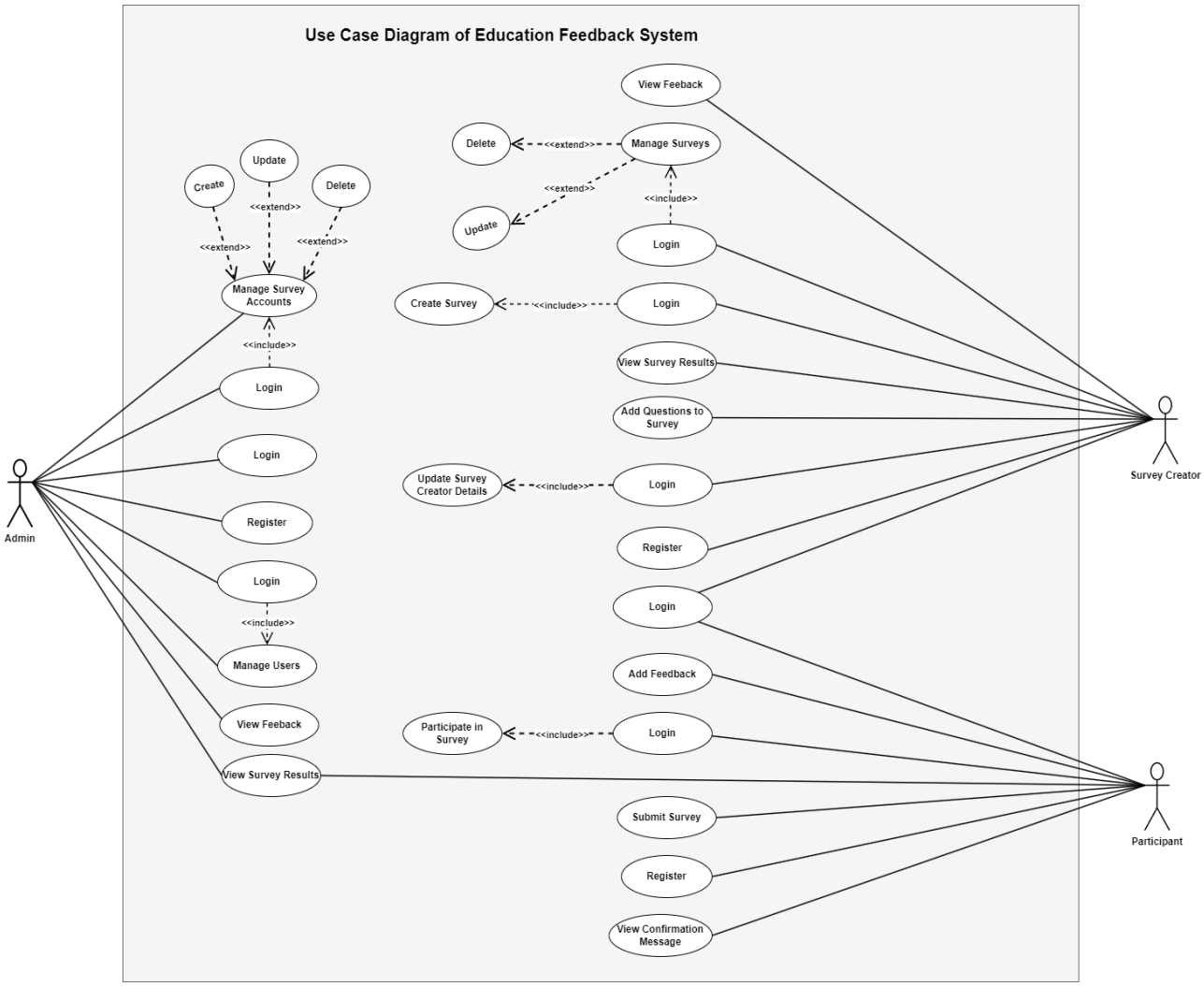


Figure 1: Use Case Diagram of Education Feedback System

UML Class Diagram

Given below is the class diagram of Education Feedback System:

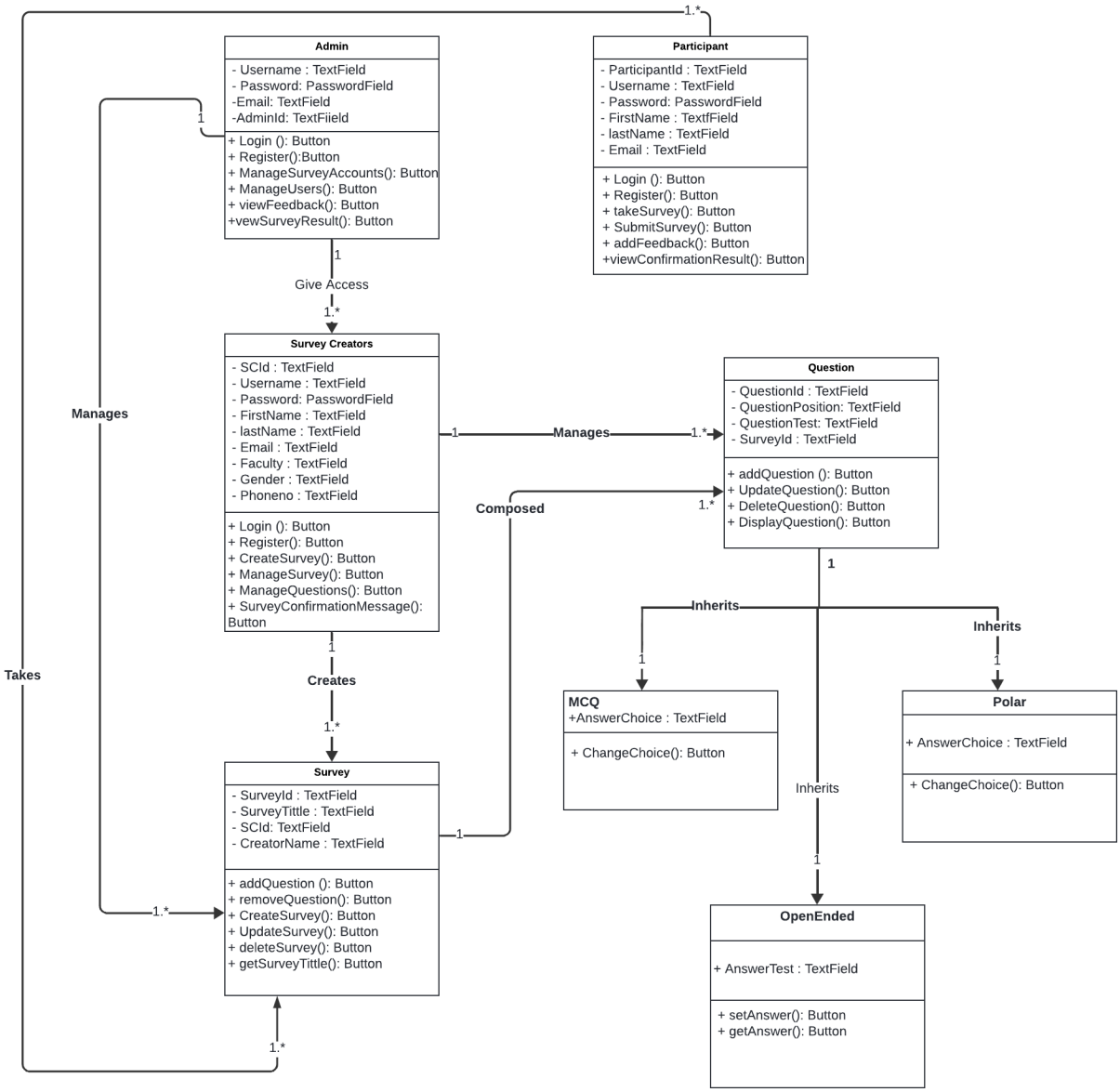


Figure 2: Class Diagram of Education Feedback System

User Interface Static Prototype

Here below is the UI static prototype of Education Feedback System:-

- **Register Page**

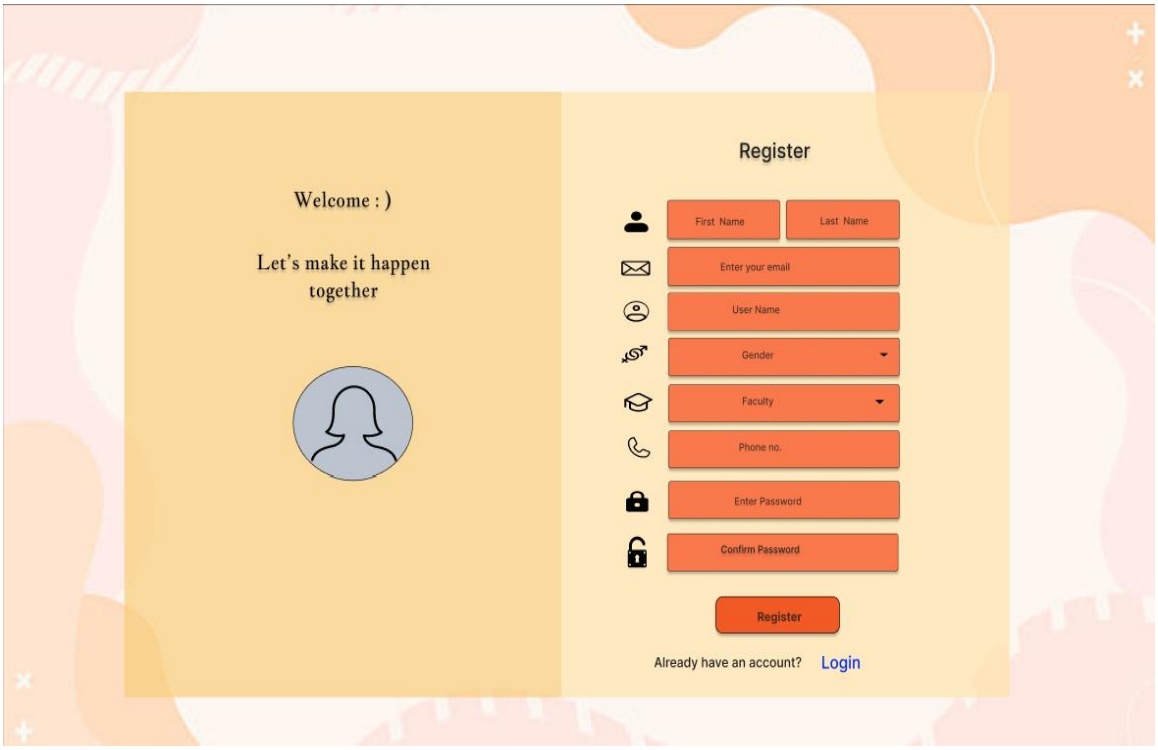


Figure 3: Register Page

Firstly, this is designed for new users/participants, including admins, and survey creators, to create an account. This form captures essential details such as username, password, first name, last name, gender, email, phone number, and, for survey creators, additional details such as faculty. The page uses methods like register() from the Admin, SurveyCreator, and Participant classes to securely store these details, ensuring proper user management for all types of users.

- **Login Page**

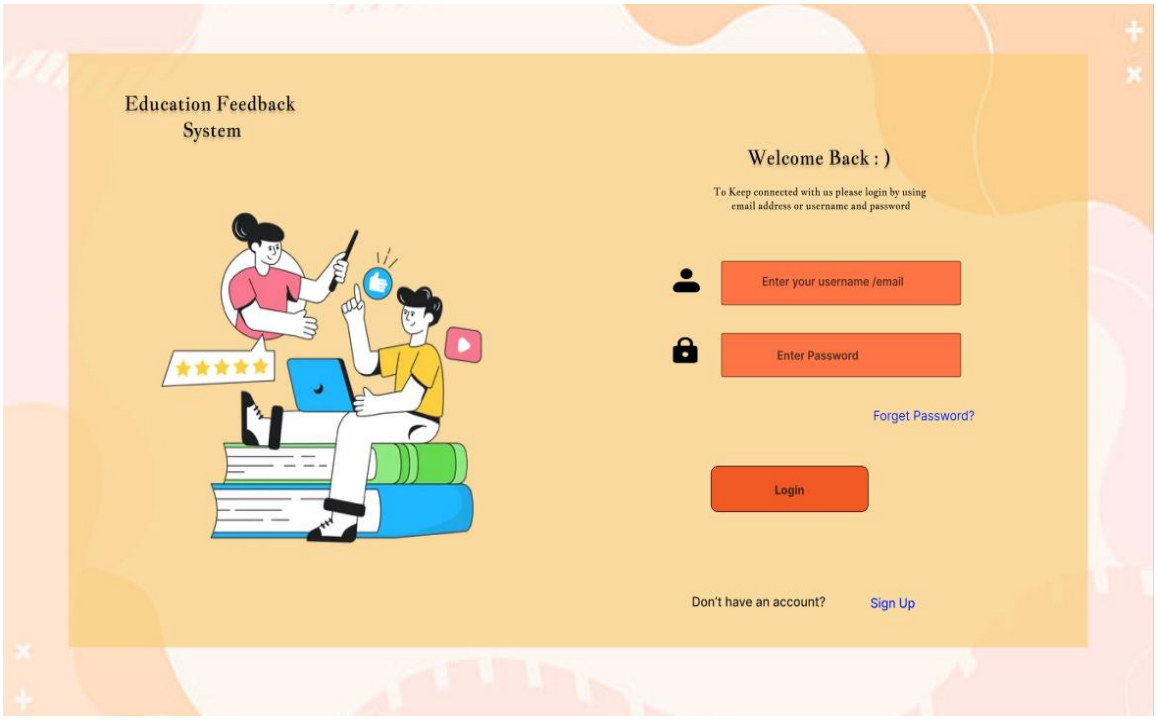


Figure 4: Login Page

Now, the Login Page allows existing users, including admins, survey creators, and participants, to access their accounts by entering their username and password. The page implements the login() method from the Admin, SurveyCreator, and Participant classes to validate credentials and grant access to their respective dashboards where they can manage their activities.

- **Begin the Survey Page**

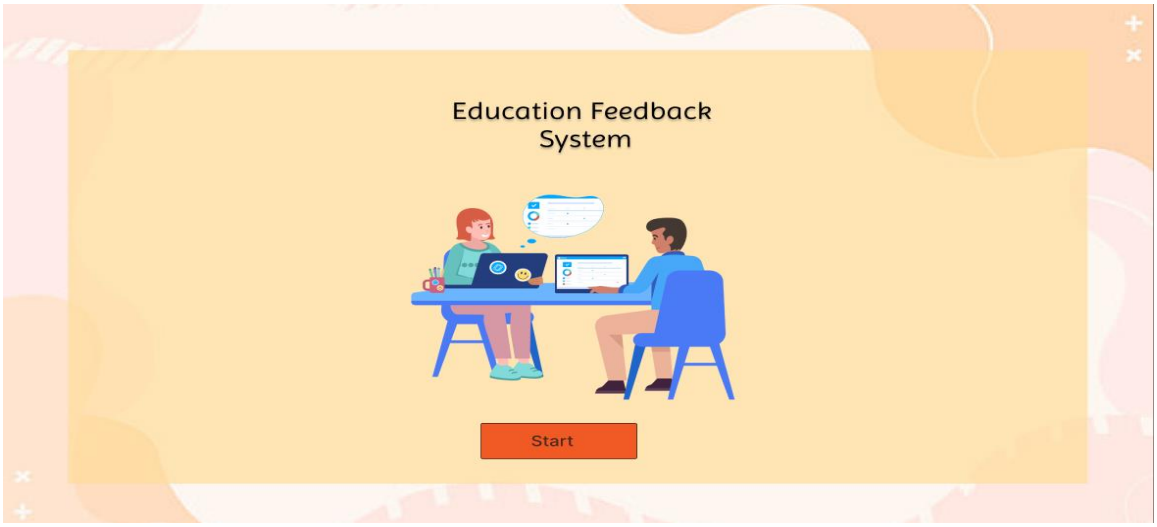


Figure 5: Start the Survey Page

Then, the begin the survey page introduces the survey to participants. Using the getSurveyTitle() method from the Survey class, it displays the survey title and creator's name. Participants can click the "Start" button to start the survey, which asks a series of questions.

- **Questions Page**

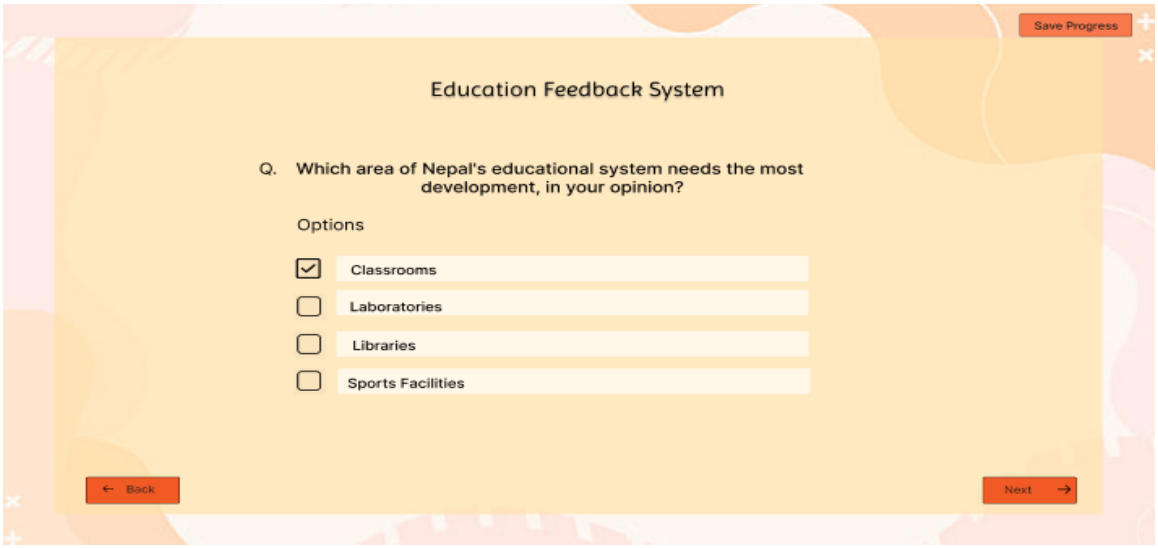


Figure 6: Question Page for MCQ and Polar

Here, this page display multiple-choice questions and polar questions. Attributes such as questionText, questionPosition, and answerChoice from the MCQ and Polar subclasses of the Question class are used. Methods like displayQuestion() and changeChoice() allow participants to select and submit their answers.

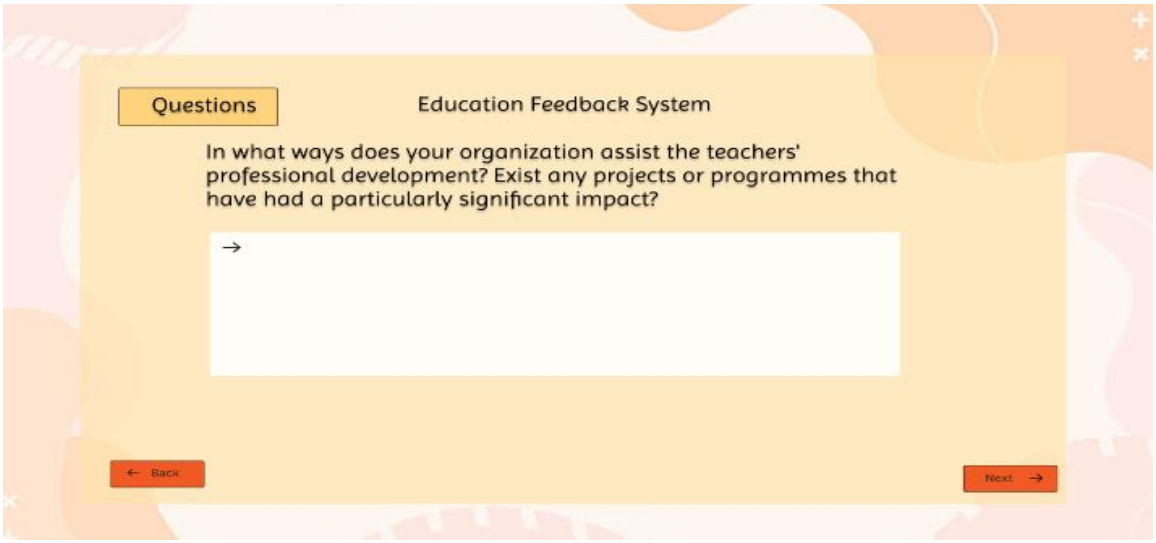


Figure 7: Question Page for Open Ended

This page is used for open-ended questions where participants can type detailed responses. It utilizes attributes like questionText and answerText from the OpenEnded subclass of the Question class. The methods setAnswer() and getAnswer() facilitate capturing and storing the participant's written feedback.

- **Final Display Page**

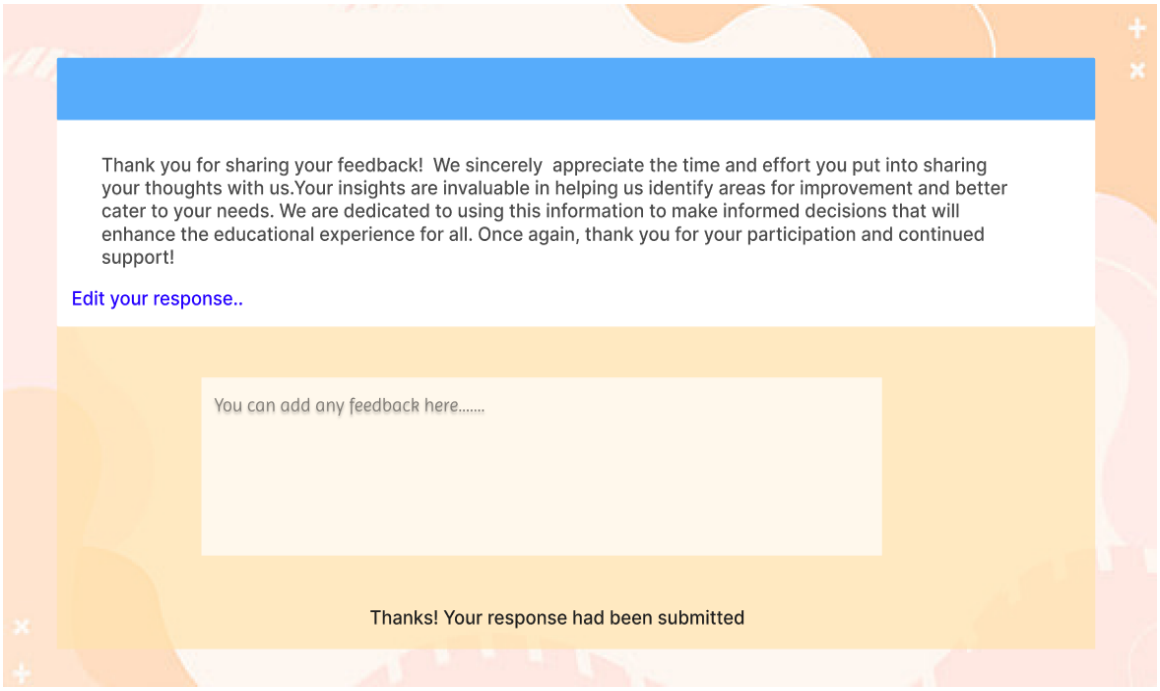


Figure 8: Final Display Page

Lastly, the Final Display page appears once participants complete the survey. It thanks them by displaying a thank you message to the users for their participation and confirms that their responses have been submitted using the submitSurvey() method from the Participant class. Additionally, this page provides a feedback box where participants can add further feedback or complaints regarding their education experience using the addFeedback() method. This ensures that participants have an opportunity to share any additional insights or concerns they might have, enhancing the system's ability to address and improve educational outcomes.

Here each interface page integrates with the respective data attributes and methods, ensuring a seamless flow from user registration through survey participation to feedback submission, enhancing the overall user experience and data integrity within the Education Feedback System.

Conclusion

As a result, the Education Feedback System is carefully designed to ensure communication and a good user experience, from initial registration to final feedback. The system provides flexibility and interactivity for participants by integrating specific information and procedures into each page interface. It provides insight into students' understanding and engagement, allowing teachers to adapt their approach to meet different needs. Such systems can support student development by providing timely and effective feedback, improve learning outcomes, and advance a culture of accountability and performance. In the end, it will contribute to the development of a supportive learning atmosphere where instructors and students can both flourish and realize their greatest potential. With an emphasis on user-friendliness and data security, the system will accommodate various question formats and evaluation models, enabling educators to create lessons that cater to the various demands of participants and, in the end, guaranteeing the ongoing enhancement of education throughout Nepal.