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3RD YEAR PROJECT REQUIREMENTS SPECIFICATION 2022

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Project Name

Smart-E

Generic Project

Tutoring web portal

Project Description

The Smart-E web portal is being created by “League Programmers”, to bring additional study material from different subject departments within a learning organization in a uniform way. It is created to track student progress through quizzes and additional study materials. Thus, making it easier for subject departments and parents to identify which subject(s) and topic(s) students struggle with.

Stakeholder Sign-off

Project Co-Ordinator
Name: Dr Bukelwa Ngoqo
Signature: B.N

Project user
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Project Sponsor

NELSON MANDELA UNIVERSITY

Project Group Members

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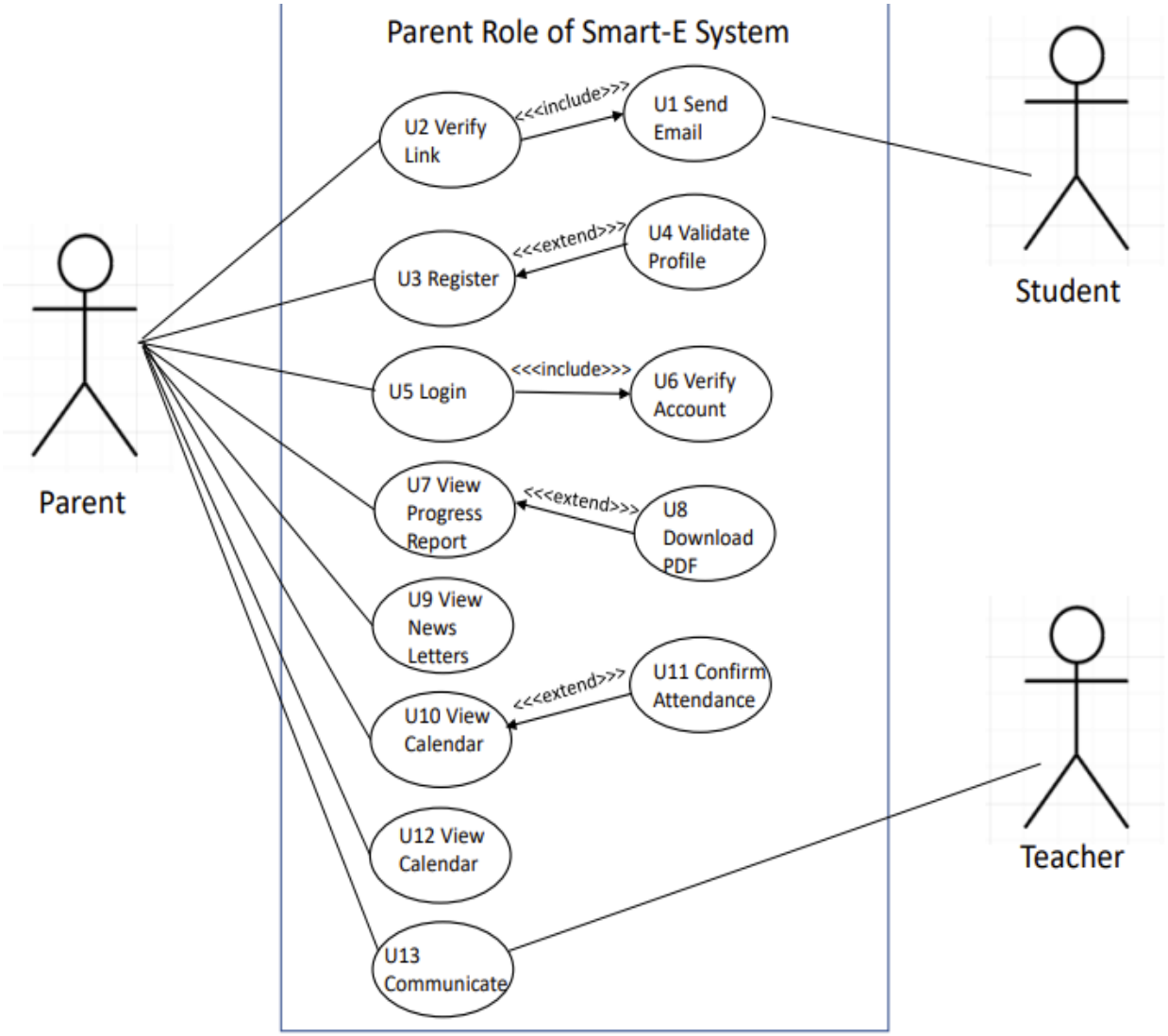
Functional Requirement

Parent



FUNCTIONAL REQUIREMENT **View Progress Report of child, U7**
Purpose - Interested in the overall performance of their child(ren)'s subject progression.
Input – Images of progress bars for graphical representation and numbers to display certain marks will be visible to the parent. A button for a file of .pdf format will be downloadable.
Process – The parent must click on their child's subject profile to view their progress. They then can click on the button "Export as PDF" to download their progress report.
Output – The document downloaded will be exported as a pdf.

USE CASE NAME	View Progress Reports	
USE CASE ID	U7	
BUSINESS ACTOR(S)	Parent	
SYSTEM ACTOR(S)	Parent	
DESCRIPTION	To observe their child(ren)'s progression in a particular course and download the report as a PDF.	
PRECONDITIONS	Must be linked to a or many children.	
TYPICAL COURSE OF EVENTS	**ACTOR ACTION**	**SYSTEM RESPONSE**
	1. User views child's course	
		2. Checks if child is associated towards the parent.
		3. Retrieve and displays child's profile information
	4. User selects link.	
		5. Displays child's course progress.
		6. Calculates and displays averages for each assignment.
	7. User selects to download progress page.	
		8. Retrieve and stores information.
		9. Downloads document as a PDF.
ALTERNATIVE COURSES/ACTIONS	2a) User cannot proceed with viewing child's profile unless they verified from the child weather the child/pupil is associated to them. 4a) Exception error is thrown if child's has no progress to show.	
TABLES USED	Student, Parent, Course, Grade, Assignment	

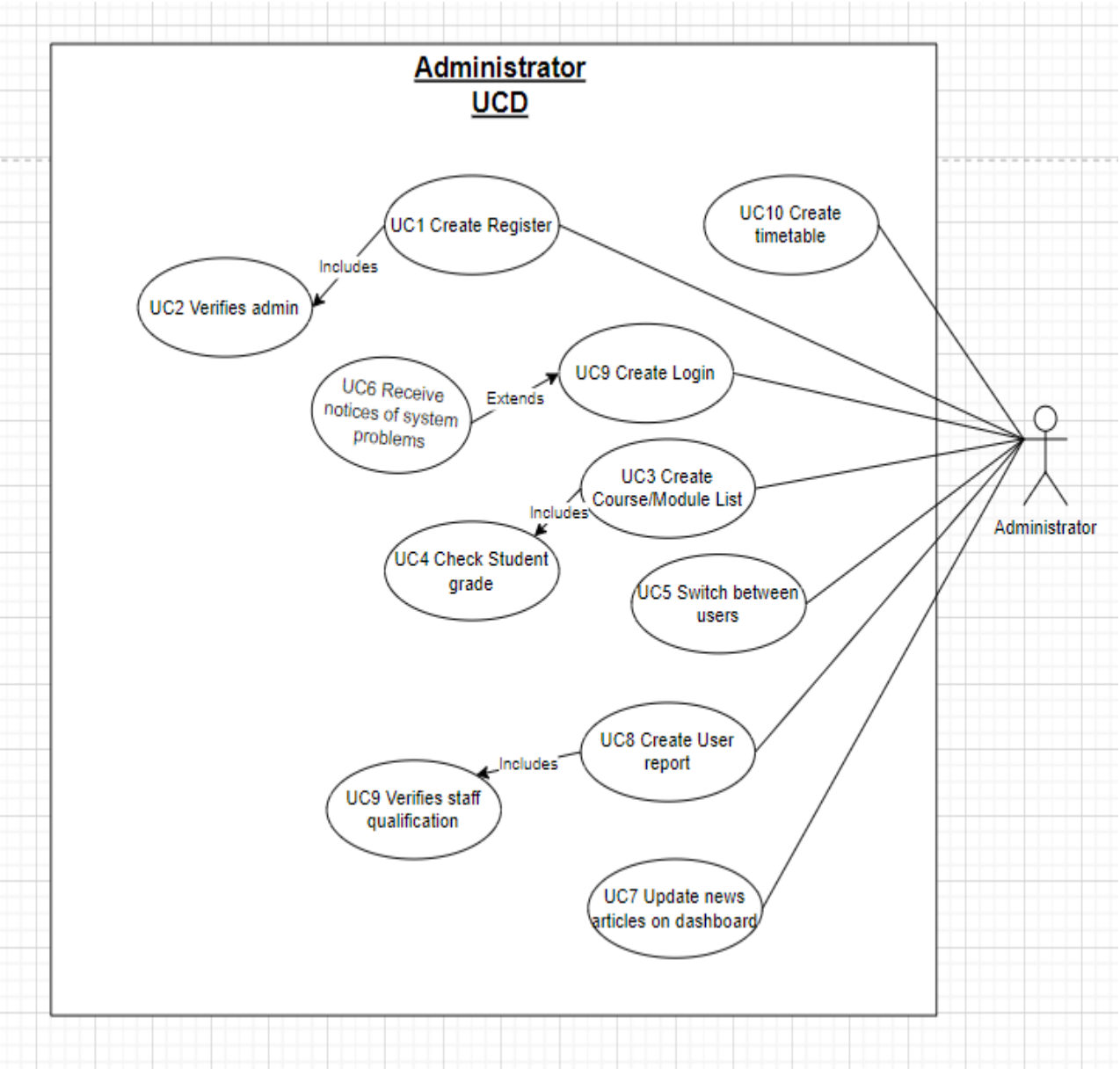
FUNCTIONAL REQUIREMENT **View Calendar, U10**
Purpose – The parent is to be aware of events that will take place and confirm attendance for events that relate to their child.
Input – An image of a calendar is used for graphical representation and numbers and text to display dates an event.
Process – When a different user creates an event and associates it to a time, date and which dependants are affected, the calendar is then updated. The parent will be notified via mail if an event has been created that relates to their child. They will then click on a button called "accept" to confirm the attendance of the event that will take place.
Output – A message will be popped to notify the parent that a new event has been created. The parents will then confirm the event and join the meeting.

USE CASE NAME	View Calendar	
USE CASE ID	U10	
BUSINESS ACTOR(S)	Parent	
SYSTEM ACTOR(S)	Parent	
DESCRIPTION	To observe the overall events that take place for their child(ren).	
PRECONDITIONS	Must be linked to a or many children.	
TYPICAL COURSE OF EVENTS	**ACTOR ACTION**	**SYSTEM RESPONSE**
	1. User views calendar.	
		2. Retrieves and displays calendar.
		3. Retrieves and displays event.
	4. User selects event.	
		5. Sends confirmation.
	6. Confirms attendance.	
ALTERNATIVE COURSES/ACTIONS	4a) User cannot proceed with the selection if an event is not associated to them or their child.	
TABLES USED	Parent, Events, Course	

FUNCTIONAL REQUIREMENT **Communicate, U13**
Purpose - Will need to communicate with Teacher.
Input – Records of certain teachers associated to the student will be displayed as text. Files and images can also be attached to the mail.
Process – The parent will click on "Email" link and will be redirected to another window to open a default mailing service to communicate directly to the wanted user.
Output –The parent will be able to send and receive mail from the teacher and vice-versa.

USE CASE NAME	Communicate	
USE CASE ID	U13	
BUSINESS ACTOR	Parent	
SYSTEM ACTOR(S)	Teacher	
DESCRIPTION	To communicate with a particular teacher.	
PRECONDITIONS	Must be linked to a or many children.	
TYPICAL COURSE OF EVENTS	**ACTOR ACTION**	**SYSTEM RESPONSE**
	1. User views teacher's profile.	
		2. Checks if the teacher is associated towards the parent's child(ren)/pupil.
		3. Retrieves and displays teachers profile information.
	4. User selects email address link.	
		5. Displays Teacher's email address.
		6. Displays default mail program.
	7.User enters message.	
ALTERNATIVE COURSES/ACTIONS	2a) User cannot proceed with viewing teacher's profile unless they verified via email which child/pupil is associated to them.	
TABLES USED	Student, Parent, Teacher, Course	

Admin



FUNCTIONAL REQUIREMENT **Create course/module List, UCD3**
Purpose – Provides course/module list
Input – Student course/module choice.
Process – Student logs in, chooses a course/module, choice is saved on Smart-E database with that student's details (name, surname, email and grade)
Output – Course/module is displayed

USE CASE NAME	Create Course/Module List
USE CASE ID	UC3
PRIMARY BUSINESS ACTOR(S)	Administrator; HOD; Teacher; Student; Parent

SYSTEM ACTOR(S)	Administrator	
TYPICAL COURSE OF EVENTS	**ACTOR ACTION**	**SYSTEM RESPONSE**
	1.Administrator creates a table of subjects	
		2.Display Subject List
	3.Students select the subject they need help on	
	5.Student enrols for subject	6.Email is sent to verify selection to Parents and Students
		7.Email notification is sent to the HOD and Teacher.
ALTERNATIVE COURSES/ACTIONS	2a.) User needs to be enrolled as a student to view list of courses and choose a course/module 6a.) Parents must be registered in the system to receive emails concerning their child's progress.	
TABLES USED	Student, Subject,	

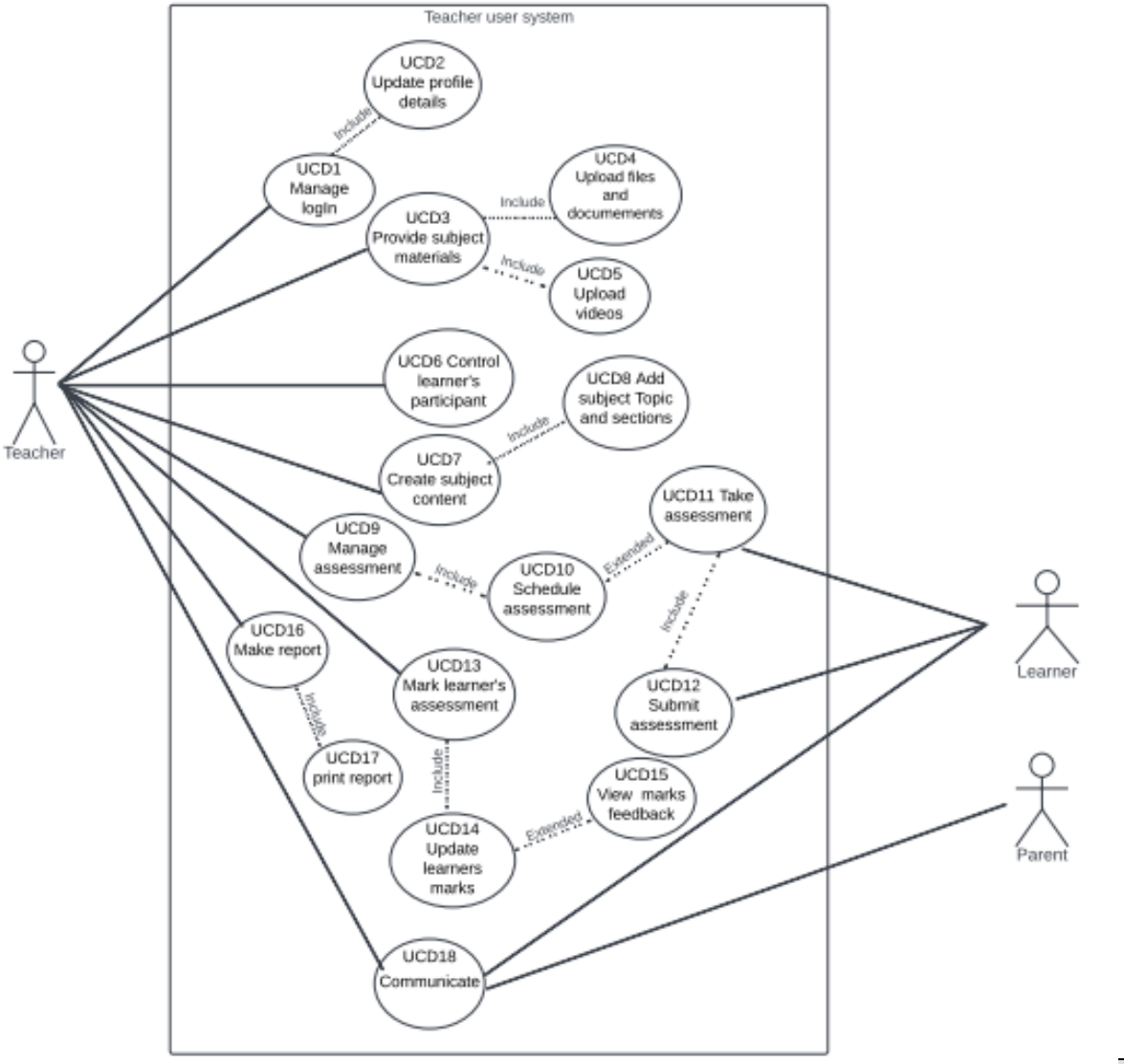
FUNCTIONAL REQUIREMENT Provide subject materials, UCD5
Purpose – Maintain optimal system operation.
Input – Admin Key.
Process – Administrator logs in, then prompted for the Admin Key.
Output – Administrator dashboard is displayed.

USE CASE NAME	Oversee System	
USE CASE ID	UC5	
PRIMARY BUSINESS ACTOR(S)	Administrator	
PRIMARY SYSTEM ACTOR(S)	Administrator	
TYPICAL COURSE OF EVENTS	ACTOR ACTION	SYSTEM RESPONSE
		1. Prompts Admin Key
	2.Admin enters Admin Key	
		3.Displays Admin Dashboard
		4.Display the topics of the subject
	5.Admin can switch between roles	
		6.Admin can view notifications of problems in the system.
ALTERNATIVE COURSES/ACTIONS	1a.) User must be an administrator to switch in between roles. 5a). Admin must enter the correct Admin Key to receives notifications of problems in the system.	
TABLES USED	Roles, Subject, Users	

FUNCTIONAL REQUIREMENT Create User Reports, UCD8
Purpose – store user records.
Input – First name, surname, email, DOB, address, password.
Process – User registers, system saves the user's input in the Smart-E database.
Output – User report is displayed

USE CASE NAME	Create User Reports	
USE CASE ID	UC8	
PRIMARY BUSINESS ACTOR(S)	Administrator; HOD; Teacher; Student; Parent	
PRIMARY SYSTEM ACTOR(S)	Administrator	
TYPICAL COURSE OF EVENTS	ACTOR ACTION	SYSTEM RESPONSE
	1.User registers	
		2. Verification email is sent
	3.User logs into the system	
		4.Displays relevant to user type reports
	5.User selects which report to view	
		6.Retrieves and displays report
	7.User clicks "Export"	
		8.Excel document downloads
ALTERNATIVE COURSES/ACTIONS	2a. User does not confirm verification. User cannot be recorded into the system unless they complete the registration.	
TABLES USED:	Users	

Teacher



FUNCTIONAL REQUIREMENT **Provide subject materials, UCD3**
Purpose – To allow teachers to upload subject materials such as documents, files, and videos to the assigned subject. The system should store study materials for learners who have enrolled for a particular subject to view and download.
Input – The system will accept study materials in a form of documents (pdf, docs, pptx) videos and links. Study materials will arrive in the same format as the original uploaded file. Other input characteristics include drop-down list to choose topic and text box for name of the file.
Process – The teacher click add study material button. The system allow teacher to enter the title and select the topic which the file will be uploaded under. Teacher attaches or choose a file from the computer and clicks upload file.
Output – The uploaded study material appears on the subject page under the topic selected. The document is saved and available on the subject page.

<table>
<tr><td>USE CASE NAME:</td><td>Provide subject materials</td><td rowspan="4">USE CASE TYPE
Business Requirements: ☐
System Analysis: ☑
System Design: ☐</td></tr>
<tr><td>USE CASE ID:</td><td>UCD3</td></tr>
<tr><td>PRIORITY:</td><td>High</td></tr>
<tr><td>SOURCE:</td><td>Subject materials</td></tr>
<tr><td>PRIMARY BUSINESS ACTOR</td><td colspan="2">Teacher</td></tr>
<tr><td>PRIMARY SYSTEM ACTOR</td><td colspan="2">Teacher</td></tr>
<tr><td>OTHER PARTICIPATING ACTORS:</td><td colspan="2">Administrator</td></tr>
<tr><td>OTHER INTERESTED STAKEHOLDERS:</td><td colspan="2">None</td></tr>
<tr><td>DESCRIPTION:</td><td colspan="2">The facilitators add study materials to the system for learners who have registered and enrolled for the subject.</td></tr>
<tr><td>PRE-CONDITION:</td><td colspan="2">The teacher has logged in and the relevant subject page is displayed on the screen.</td></tr>
<tr><td>TRIGGER:</td><td colspan="2">This is initiated when the teacher clicks the upload document button.</td></tr>
<tr><td rowspan="3">TYPICAL COURSE OF EVENTS:
(Step by Step interaction)</td><td>ACTOR ACTION</td><td>SYSTEM RESPONSE</td></tr>
<tr><td>1. The facilitator clicks upload document.</td><td>2. The system displays add document page and prompts the teacher to select a topic, type document name and choose a file to upload.</td></tr>
<tr><td>3. The teacher selects the topic, type name and choose a file from file explorer then clicks upload document button.</td><td>4. The display the subject page with the added document under the topic.</td></tr>
<tr><td rowspan="2">ALTERNATE COURSES:</td><td colspan="2">3a) The teacher submits incomplete information.</td></tr>
<tr><td colspan="2">4a) The system prompts the user to fill in the missing information to complete the task.</td></tr>
<tr><td>CONCLUSION:</td><td colspan="2">The document shows on the subject page.</td></tr>
<tr><td>POST-CONDITION:</td><td colspan="2">The uploaded document is displayed on the subject page and can be downloaded.</td></tr>
<tr><td>BUSINESS RULES</td><td colspan="2">Anything added on the subject site must be related to the subject content.</td></tr>
<tr><td>IMPLEMENTATION CONSTRAINTS AND SPECIFICATIONS</td><td colspan="2">Database must be secured from external attacks.
All learners taking the subject must be able to locate and use resources the teacher adds.</td></tr>
</table>

ASSUMPTIONS:	The system runs smoothly. The system accepts any type of document, file, or video size.
OPEN ISSUES:	Server down or loss of internet connection while filling information or uploading documents.
TABLES USED:	Subject, Document,

FUNCTIONAL REQUIREMENT **Manage assessment, UCD9**
Purpose – Teacher to schedule, create assessments and add to the system. Teacher can create type of assessment. The system must also allow a teacher to edit or delete the assessment.
Input – The system input must accept assessment in a form of document or quiz. The assessment must have text boxes for date, time and duration scheduled for assessment, select box for type of assessment. Assessment question will be in a form of multiple choice, match column and text answer.
Process – Click create assessment button, choose which type of assessment to be added. If the teacher selects a document, an upload folder will appear for the document to be uploaded. For cases where a teacher chooses a quiz, the system will prompt the teacher to type a question and select a question type. Complete the creation by entering the grade, duration, time of availability and click add quiz.
Output – For quiz assessment, questions must come out in a numeric sequence and include the total percentage, duration open and close time of the assessment. The destination of the output will be on the system on list of assessments on a subject page.

USE CASE NAME:	Manage assessment	USE CASE TYPE
USE CASE ID:	UCD9	Business Requirements: ☐
PRIORITY:	High	System Analysis: ☑
SOURCE:		System Design: ☐
PRIMARY BUSINESS ACTOR	Teacher	
PRIMARY SYSTEM ACTOR	Teacher	
OTHER PARTICIPATING ACTORS:	Administrator	
OTHER INTERESTED STAKEHOLDERS:	None	

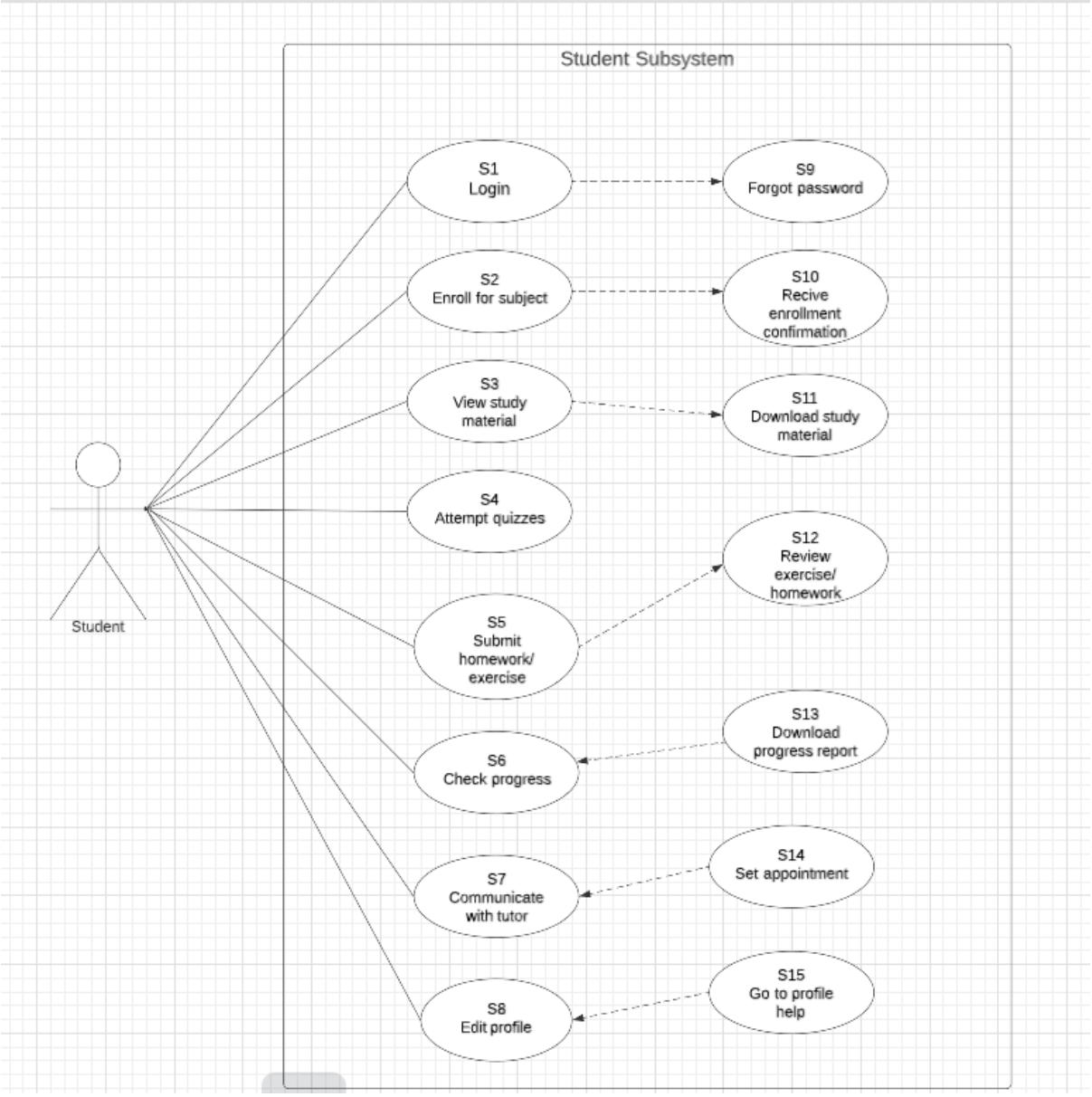
DESCRIPTION:	This describes how the teacher manages assessments, creates, edits and deletes assessments in the system.	
PRE-CONDITION:	The teacher has already logged into the system and uploaded required study materials for the upcoming assessment.	
TRIGGER:	It starts when the teacher clicks the add assessment button link.	
TYPICAL COURSE OF EVENTS: (Step by Step interaction)	**ACTOR ACTION**	**SYSTEM RESPONSE**
	1. The teacher clicks the add assessment link button.	2. The system displays add assessment page and text boxes prompting the teacher to select the type of assessment, questions to be added, date and time, duration, total mark, and percentage.
	3. The teacher chooses the type of assessment from list box type questions, date and time, duration, total mark and percentage to be added in the assessment then clicks the upload button.	4. The system goes back to the subject page with a link for the added assessment.
ALTERNATE COURSES:	3a) The system validates the input information entered by the teacher.	
	3b) The teacher can cancel the assessment while in the process of adding it.	
	4a) The teacher can edit or delete the assessment any time after adding it to the subject.	
CONCLUSION:	This use case concludes when the new assessment shows on the subject page and the teacher adds the assessment to the task calendar for learners to see the scheduled assessment.	
POST-CONDITION:	The assessment is available on the subject page, date, time, duration, and total marks are displayed.	
BUSINESS RULES	Assessment must not be on weekends or public holidays. The assessment must not collide with other assessments that have the same learner enrolled on.	
IMPLEMENTATION CONSTRAINTS AND SPECIFICATIONS	Database must be secured from external attacks. The time and date must be included in the assessment. Learner cannot attempt the assessment before time.	
ASSUMPTIONS:	The system runs smoothly.	
OPEN ISSUES:	Assessment database must not be corrupt. Server down or loss of internet connection while filling information.	
TABLES USED:	Subject, Teacher, Teacher_Subject, Assessments, Question	

FUNCTIONAL REQUIREMENT Make report, UCD16
Purpose – The system will have created, download, save and print the report. There will be types of report template for teacher e.g., attendance report, learners' assessment report in the system.
Input – Inputs that will be accepted are text fields, radio buttons, and drop-down lists that allow teacher to filter the data in reports. Dynamic report inputs contain table for learners' names and require a data set to supply the values. The report must tables, text boxes to be filled on a report template and arrive as the same format. Sources for the input will be learners' assessment marks, attendance register etc.
Process – The teacher chooses type of report template. The teacher enters the report heading, description and fill the table with headings and data for a report. At the end of report teacher save the report and print it.
Output – The report final layout must have report title page numbers, introduction about what the report is about. The content of the project including tables, data recordings etc. At the bottom of the report there will be conclusion and data references. The report will be saved on the system and can be printed out, the report should be clear and readable, the system will indicate if there are any errors in the report to be fixed.

USE CASE NAME:	Make report	USE CASE TYPE
USE CASE ID:	UCD16	Business Requirements: ☐
PRIORITY:	Very high	System Analysis: ☑
SOURCE:		System Design: ☐
PRIMARY BUSINESS ACTOR	Teacher	
PRIMARY SYSTEM ACTOR	Teacher	
OTHER PARTICIPATING ACTORS:	None	
OTHER INTERESTED STAKEHOLDERS:	HOD Administrator	
DESCRIPTION:	This use case describes how the teacher makes and generates a report from the system to submit to the HOD.	
PRE-CONDITION:	The teacher has already logged in, clicked report button and there is report template/form displayed on screen.	
TRIGGER:	When a user selects the type or report template they want to use for their report.	
TYPICAL COURSE	**ACTOR ACTION**	**SYSTEM RESPONSE**

OF EVENTS: (Step by Step interaction)	1. The teacher selects a report template.	2. The system displays the report template page and prompts the teacher to fill in heading, report description and tables displayed.
	3. The teacher input data and information required.	
		5. The system shows review of the teacher report.
	6. The user clicks the submit button to save the report.	7. The system saves the report and adds it to the report list.
	8. The teacher downloads or prints the report from the system.	9. The system generates the report.
ALTERNATE COURSES:	1a) The teacher does not select report template.	
	3a) The teacher has incomplete information.	
	6a) The teacher click save a drafted report.	
	7a) The system goes back to the beginning of the make report process.	
CONCLUSION:	This use case concludes when the report is generated.	
POST-CONDITION:	The system prints the report or saves it on the system.	
BUSINESS RULES	Only the teacher can access or choose to share the report.	
IMPLEMENTATION CONSTRAINTS AND SPECIFICATIONS	Database must be secured from external attacks	
ASSUMPTIONS:	The system runs smoothly.	
OPEN ISSUES:	Report database must not be corrupt. Server down or loss of internet connection while filling information.	
TABLES USED:	Report, ReportType, Attendance	

Student



FUNCTIONAL REQUIREMENT **Use Case Name: Enrol for Subject** **Use case ID: S2**
Purpose – To review and select subject(s) available
Input –A drop-down list of available subjects will be provided, and the student must select subject name from the subject list provided.
Process -Student will click the drop-down list to view the list of subjects. Student selects subject name from the list. Select grade for the selected subject. Click enrol.

Output – The drop-down box shows the list of subjects. System shows list of standards available for the selected subject. A welcome message will pop up. Student will have access to the subject content.

USE CASE NAME	Enrol for Subject	
USE CASE ID	S2	
BUSINESS ACTOR(S)	Student	
SYSTEM ACTOR(S)	Teacher	
Description	To enrol into the subject(s).	
Preconditions	Must be registered into the system	
TYPICAL COURSE OF EVENTS	ACTOR ACTION	SYSTEM RESPONSE
	1. The student enters the subject name into the search bar and selects search.	
		2. The system captures the name and display the list of standards offering the searched subject.
	3. The student selects the standard.	
		4. The system redirects to the enrolled subject page
ALTERNATIVE COURSES/ACTIONS	2.1) There is no standard associated to the subject searched 2.2) A search another subject message will be displayed	
TABLES USED	Student; Grade; Subject	

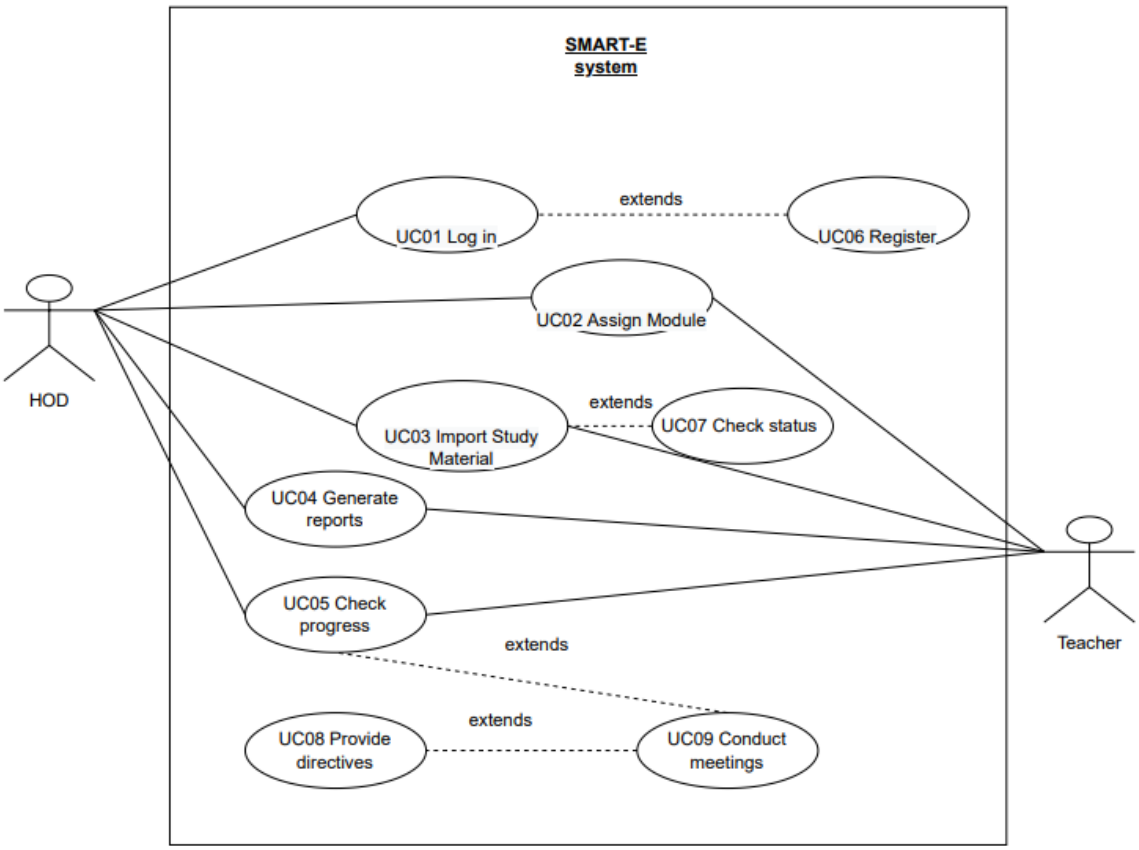
FUNCTIONAL REQUIREMENT **Use Case Name: View Study Material** **Use case ID: S3**
Purpose –View uploaded study material.
Input – Student must be enrolled for the subject(s) to access the study materials.
Process – Student select subject Student selects the topic of choice. Student clicks the document provided to view topic content Should the student want to download the document, they can click download.
Output – A list of topics will appear. The system will redirect to another window to display the selected document.

USE CASE NAME	View Study Material	
USE CASE ID	S3	
BUSINESS ACTOR(S)	Student	
SYSTEM ACTOR(S)	Teacher	
Description	The student views the posted study materials.	
Preconditions	Must be enrolled for the subject.	
TYPICAL COURSE OF EVENTS	ACTOR ACTION	SYSTEM RESPONSE
	1. Student selects subject	
		2. The system display's subject content.
	3. Student selects subject topic.	
		4. System display's study materials. .
	5. The student selects study material document.	
		6. The system display's the document.
ALTERNATIVE COURSES/ACTIONS	5.1) Student selects download 5.2) The document is saved on their device	
TABLES USED	Student; subject; Subject_Topic	

FUNCTIONAL REQUIREMENT Use Case Name: Submit homework/ exercise Use case ID: S4
Purpose – Grant student to submit additional homework/ exercises posted on the web portal.
Input - Click on the submission link provided under the downloadable document
Process – When the student selects the submission link provided. A new page will appear, and the student will be prompted to select a document from the file explorer
Output – The student will get a notification that a document Required been submitted

USE CASE NAME	Submit homework/ exercise	
USE CASE ID	S4	
BUSINESS ACTOR(S)	Student	
SYSTEM ACTOR(S)	Teacher	
Description	The student attempts the quizzes posted to measure understanding of the topic.	
Preconditions	Must be enrolled for the subject.	
TYPICAL COURSE OF EVENTS	ACTOR ACTION	SYSTEM RESPONSE
	1. Student selects attempt quiz	
		2. The system display's quiz
	3. The student selects the standard.	
		4. System saves the selected answers.
	5. The student selects submit quiz after answering the quiz question.	
		6. The system saves the quiz the teacher to mark.
ALTERNATIVE COURSES/ACTIONS	4.1) The system is unable to save the selected answer.	
TABLES USED	Student; Subject	

HOD



FUNCTIONAL REQUIREMENT **Assign Module, UC02** ***(must match UCD 100%)***.
Purpose – To add a teacher to a module
Input – Combo boxes will be made available where the HOD can select a teacher and select a module and assign teacher to module
Process- If a teacher is already assigned to a specific module then an error message is displayed. If successful, info is then added to the database
Output – After assigning was successful the teacher is notified via email of their modules for the year

USE CASE NAME	Assign Module	
USE CASE ID	UC02	
BUSINESS ACTOR(S)	Head Of Department	
SYSTEM ACTOR(S)	Web portal	
OTHER PARTICIPANTS	Teacher	
DESCRIPTION	HOD will assign modules to relevant teachers to teach relevant students.	
PRECONDITIONS	A list of modules will be made available by system for HOD to assign to relevant teachers.	
TYPICAL COURSE OF EVENTS	ACTOR ACTION	SYSTEM RESPONSE
	1. Choose module	
		2. Display teachers available for module
	3. Choose teacher	
		4. Assign module to teacher
		5. Notify teacher
ALTERNATIVE COURSES/ACTIONS	1a) if only one teacher is available system auto assign module to teacher.	
CONCLUSION	Teacher is notified by system for their modules.	
TABLES USED	HOD, Module, Teacher	

FUNCTIONAL REQUIREMENT **Generate reports, UC04** ***(must match UCD 100%)***
Purpose – This is to get progress of the teacher
Input – a HOD search for a specific teacher in the database via a webpage
Process – the teacher's name is displayed if it matches with any name in the database
Output – When a HOD clicks on a teacher's name their info pops up and a report for every module is displayed

USE CASE NAME	Import study material	
USE CASE ID	03	
BUSINESS ACTOR(S)	Head Of Department	
SYSTEM ACTOR(S)	Web portal	
OTHER PARTICIPANTS	Teacher	
DESCRIPTION	HOD will assign modules to relevant teachers to teach relevant students.	
PRECONDITIONS		
TYPICAL COURSE OF EVENTS	ACTOR ACTION	SYSTEM RESPONSE
	1. Upload study material.	
		2. Make material available to the relevant teacher.
		3. Notify the teacher when material has been uploaded
ALTERNATIVE COURSES/ACTIONS	2a) If not in pdf format system sends error message to Actor.	
CONCLUSION	Teacher is notified by system for their modules.	
BUSINESS RULES	Must be in PDF format.	
TABLES USED	HOD, STUDY_MATERIAL, TEACHER	

Non-Functional Requirements

In this system, user authentication is very important. The authentication will be done by the login with the use of a username and password. Users will get access to the system as permissions are classified for that type of user. The system has a consistent interface which is easy to use. With the use of big, colourful buttons and easy navigation, forms are used to enter and retrieve data. It will also be easy to use and understandable for non-technical users. The system should work in multiple web browsers. It should be easily maintainable when adding and removing data.

There should be proper security regarding the accessing data by an unauthorized user. The system has backup for the database and should always be available at any time user want to use it. The system allows users to access their data from any device. User can access the E-learning software panel from their mobile phones using their web browser.

It should be efficient if it is carrying out user tasks. Every unsuccessful attempt by a user to access an item of data shall be recorded on an audit trail. The admin can change access permission for other users. Admin allows users to update any of their information on their User Profiles. Ensure verification emails are delivered to users on the relevant action a user does. Ensures user roles are validated to allow only authorized person(s) to view certain information. Web portal will use Nelson Mandela University's server. Therefore, many users can use the web portal at once.

Security

For the protection of all users, security software is essential. Confidentiality must comply with all users. Authentication and password management shall be implemented. These include making sure that the users register with a password that contain certain characters to ensure strong protection onto their account. The password must have 8 or more characters and have at least one number and one non-Alphanumeric characters. Passwords are then stored and converted as hashes, so that system Administrators cannot view any users' passwords.

Because safety is so important, inactive time-outs will also be implemented after 30 minutes when the user is not using the system. When these time-outs occur, the users must login onto the system once again.

The system will comply based on a particular user's role. Each role is different and obtain certain rights and this sets permissions, without changing the ownership of the directory.

Database Requirements

Entity	Attributes	Business rules for storing, processing or transmitting data
Teacher	UserID, First name, Surname, ID number, DOB, email address, Password, Home language, Race, Role, Residential Address, Postal Address, Work number, Mobile Number	1. A teacher may not be added without an ID number. 2. A teacher may not be deleted if a subject is assigned to them. 3. A Teacher is uniquely identified by userID and may therefore not be duplicated. 4. A teacher must have a legal qualification to teach.
Attendance	AttendanceID, Date, Comment, UserID	
Assessment	AssessID, Name, Total, Percentage, Due date, Duration, TeacherSubjectID, TypeID, QuestionID	1. An assessment must have a question list.
Subject	SubjectID, SubCode, Name, Duration, Description, GradeID	1. A subject may not be added without a subject code or grade.
Teacher subject	TeacherSubjectID, UserID, SubjectID	1. Each teacher must be assigned to a subject.
Class	GradeID, Name, Code	1. Classes must have subjects
Questions	QuestionID, QuestionText, AssessID	1. A question must belong to an assessment.
HOD	ID number, First name, Surname, Residential Address, Postal Address, Work number, Mobile Number, Email Address	1. A HOD may not be added without an ID number. 2. A HOD may not be removed if their associated with a teacher 3. A HOD is uniquely identified by his/her ID number and may therefore not be duplicated.
MODULE	ModuleNo, ModuleName, HOD(FK), Teacher (FK)	1.A module is added if the teacher is selected and HOD is selected
REPORT	ReportID, Desc, Teacher (FK), HOD(FK)	1.Report is only generated to teachers that's registered and students of the same module.
STUDY_MATERIAL	ReportID, Desc, Teacher (FK), HOD(FK)	1.Study material is only given when teacher is assigned to the specific module
QUALIFICATION	QualificationID, DESC, HOD(FK)	1.Must have Qualification to be able to be HOD

Parent	ParentID, First name, Surname, Address, StudentID (FK)	1.Must receive verification from the student to confirm that the parent is associated to the student.
Student	StudentID, Subject (FK), Grade, TeacherID (FK), Name, Surname,	1.Must be a high school student and registered on the web portal

User Interface Requirements

Description of User Interface Requirements

The SMART-E application is crucial to follow certain rules when designing the GUI. The fonts are bold, large, and readable for older viewers to read the text. This causes no eye strain.

School can be very stressful. Therefore, the SMART-E logo is a neon, light blue, which represents calm and serene emotions to accommodate for the users. The consistency of using colours such as blue and purple are evident in the application, which is also adaptable on the eyes.

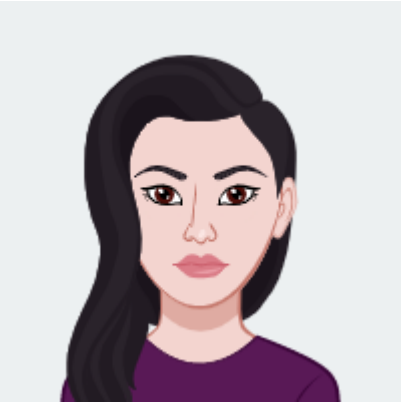
Information presented is consistent throughout the interface. A privacy policy is also implemented to display to all users. Certain types of information are not being shared among other users, such as, passwords.

All pages are easy to access, learn, and does not require too much training. Specific commands do not need to be memorized as everything is easy to accomplish.

Certain goals that want to be accomplished is adding interactive communication from the system to the users. These include error messages, confirmation conditions, automatic responses, and security restrictions.

User Profiles

Parent



User Profile Caelan Longmore

AGE:		39
OCCUPATION:	Content	Writer
STATUS:		Married

Caelan is portrayed as a “coach” to guide and support her children during their e-learning process. She can view their child(ren)’s progression, email their teachers and read the latest newsletters.

Parents are causal users of the system and do not obtain all access rights. They can only observe for which children are in correspondence to them and do not need to use the system daily. The amount of time they will use the system will be weekly depending how frequent their child(ren) uses the system.

Caelan is excellent in computer literacy skills but does not need to understand the system, as the web portal is very easy to access and use. Most necessary skills require her to click on her desired function.

She is very critical that her children get the outmost best from their education. She is from the Western Cape and is learning to achieve long distance, online learning. This is a great way in which she can practice and get the most out of it!

Admin

User Profile of Jack Reacher *(Administrator)*

"School administrator with over seven years of experience. Reputation for improving administrations through fostering student-centric and growth-oriented school environments. Skilled handling board- and state-led school inspections. Possess excellent team management skills and work with faculty to maintain high educational standards."

MOTIVATIONAL SCENERIO

Promote closer connection between school, home and community strategically involving parents, students and staff in school programs and activities to achieve an overall increase in school pride as evidence by a decrease in altercation.

League Programmers was approached in the beginning of by2022 to develop a tutoring web portal for a high school system. League Programmers are now working closely with the client to provide a project that meets the client's requirements.

PERSONAL BACKGROUND

AGE:
32
STATUS:
Not married
Education:
September 2000 - June 2004
BSc. in Computer Science
Nelson Mandela University

PROFESSIONAL EXPERIENCE

OCCUPATION:
Full-time Project Administrator at League Programmers
INCOME:
R65 000

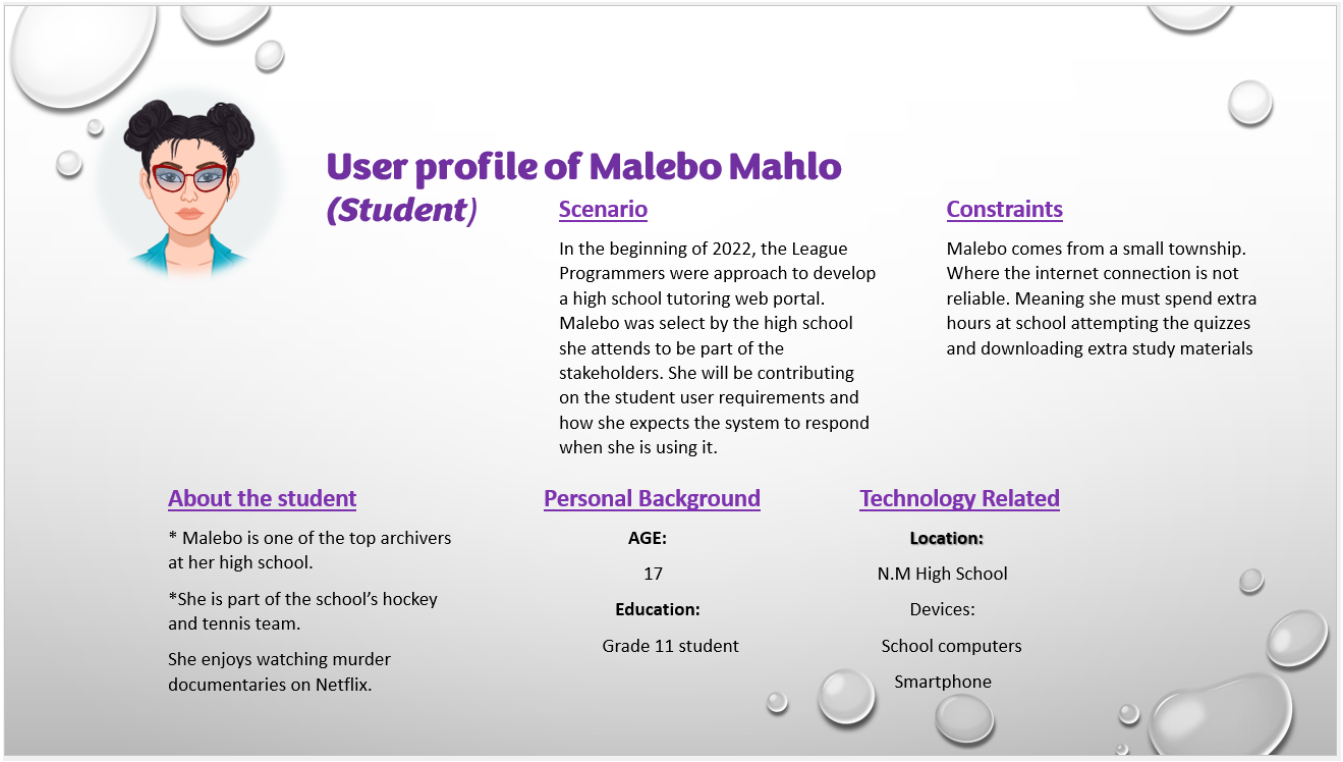
TECHNOLOGY-RELATED

LOCATION:
His office
DEVICES:
Mostly on his laptop, but also on his phone.

CHARACTERISTICS

Enjoys watching anime and playing online games.
Appreciates working in a team.
Enjoys reading articles about new technology.
Tends to favour working functions over application design.

Student



Teacher

The teacher will login into the system and the dashboard will be displayed. On the top right there will be a teacher picture with the name Gauta Mahlasela. On the left side there will be side menu shortcuts where the teacher can click and be directed to another page of the system. The menu will include the subject, report, grades and assessments a teacher can access.

Characteristics:

A 27-year-old female from Free State, Bloemfontein. A black Christian who speaks Setswana as a home language, can write and speak English, Afrikaans, and Xhosa fluently. Professional teacher who obtained a four-year Bachelor of Education degree (B.Ed.) at the Nelson Mandela university with 5-years of experience in teaching high school learners' math and science. She is an expert and flexible when it comes to teaching, engaging with learners, using computers and knows her ways in the system. She uses the system frequently and communicate with parents and learners.

Task:

Making sure that learners are engaged in working toward learning goals. She has strong critical thinking skills; she remains aware of parents' expectations for learning and discipline and ensure that the E-learning system is a safe and nurturing environment. She knows the best ways to keep learners engaged with the subject material. She helps maintain a balance between her own expectations and the learners' unique abilities.

Skills:

Strong verbal communication, she makes subject material and expectations clear. She present concepts in a way that learners can understand. Besides tracking grades, she uses the system to formulate subject plans, worksheets, study guides, tests, and other deliverables

HOD

- **An HOD is there to oversee that the Teachers is making progress in the school**
- **Provide directives to teachers**
- **Will mostly interacts with teachers**
- **A user must have relevant qualification/s to be able to be HOD. The system requires a HOD that's experienced at computers**
- **A HOD sets goals for teachers to reach**
- **The system is used frequently by the HOD to make sure teachers is up to date**

Low Fidelity Prototypes

Admin

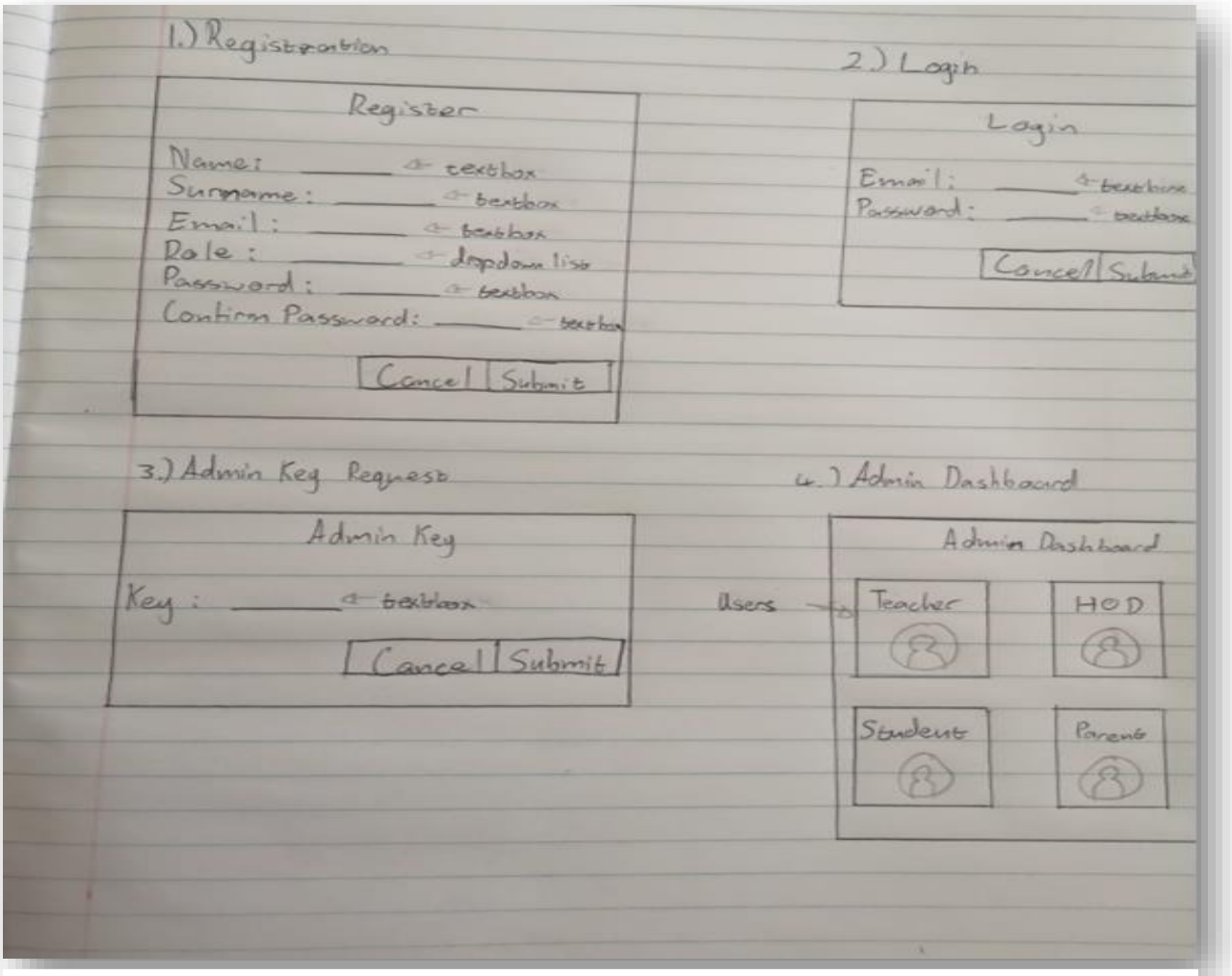


Figure 1: Admin low fidelity prototype

Student

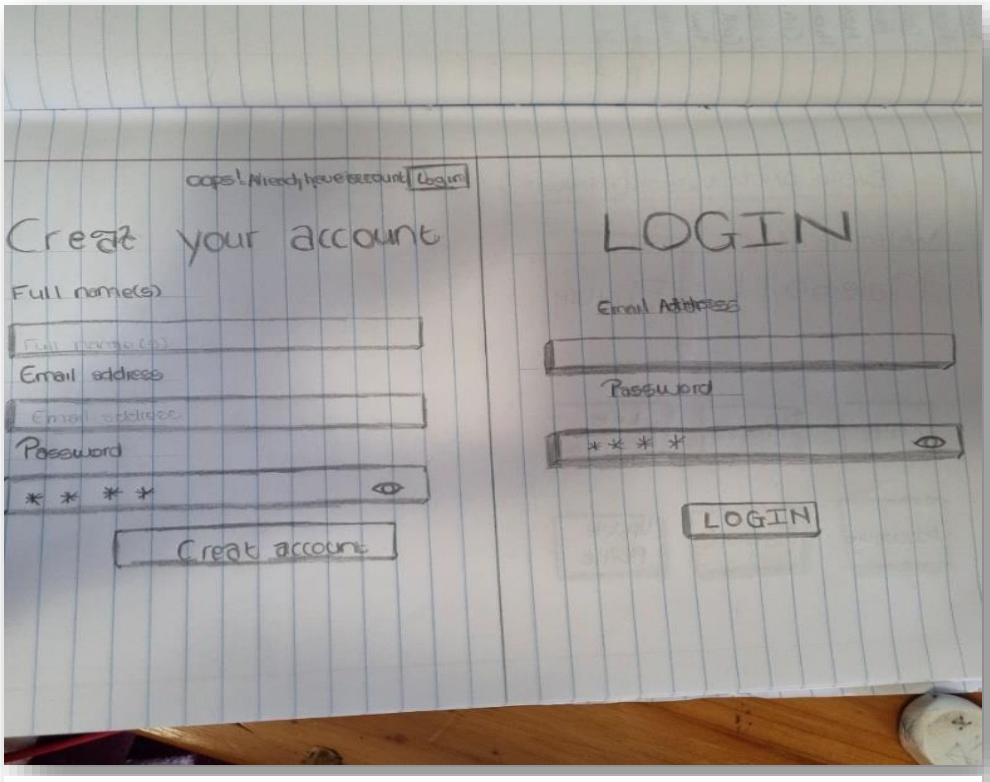


Figure 2: Student low fidelity prototype

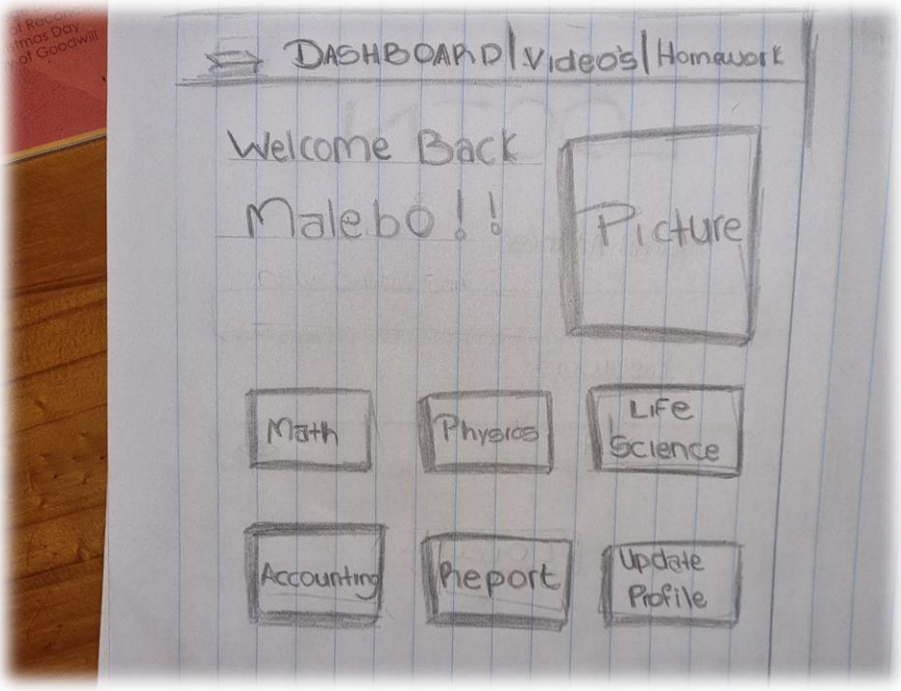


Figure 3: Student low fidelity prototype (2)

HOD

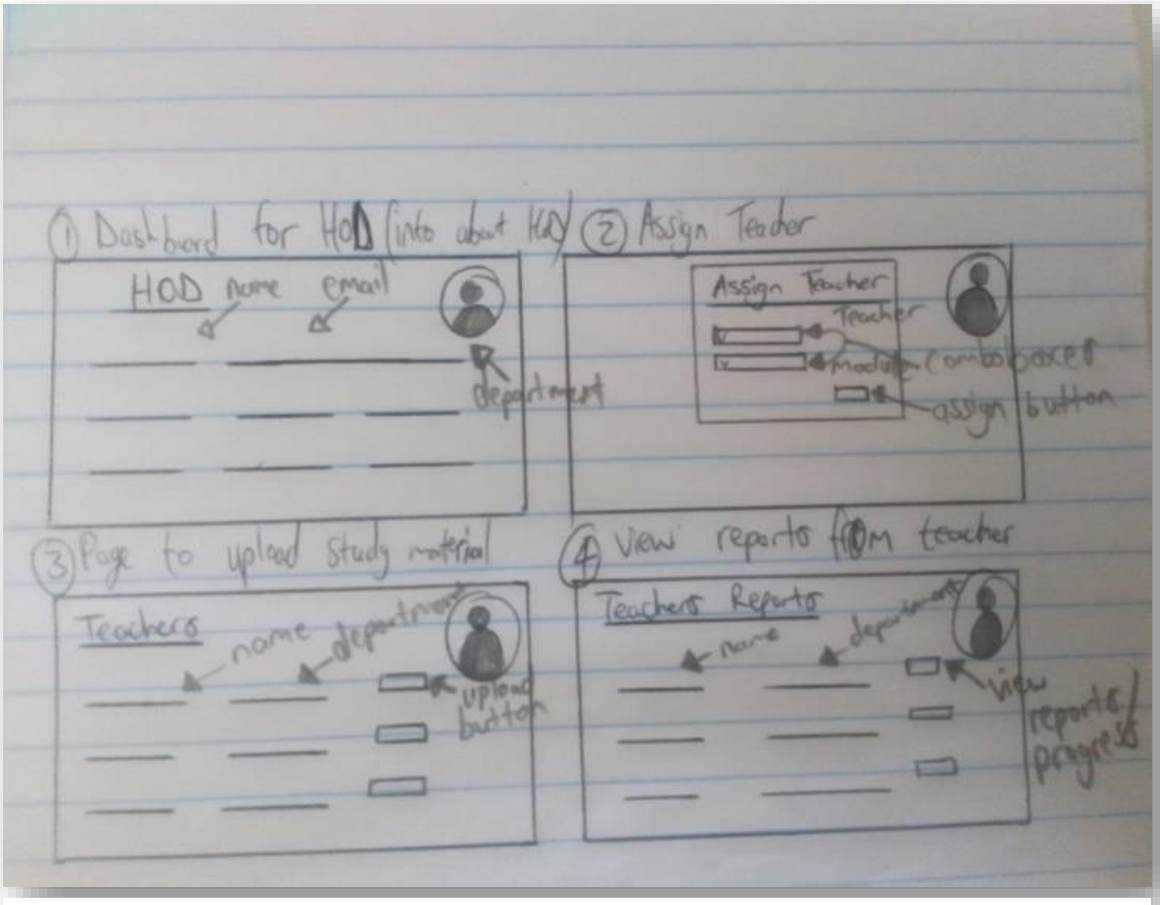


Figure 4: HOD low fidelity prototype

Teacher

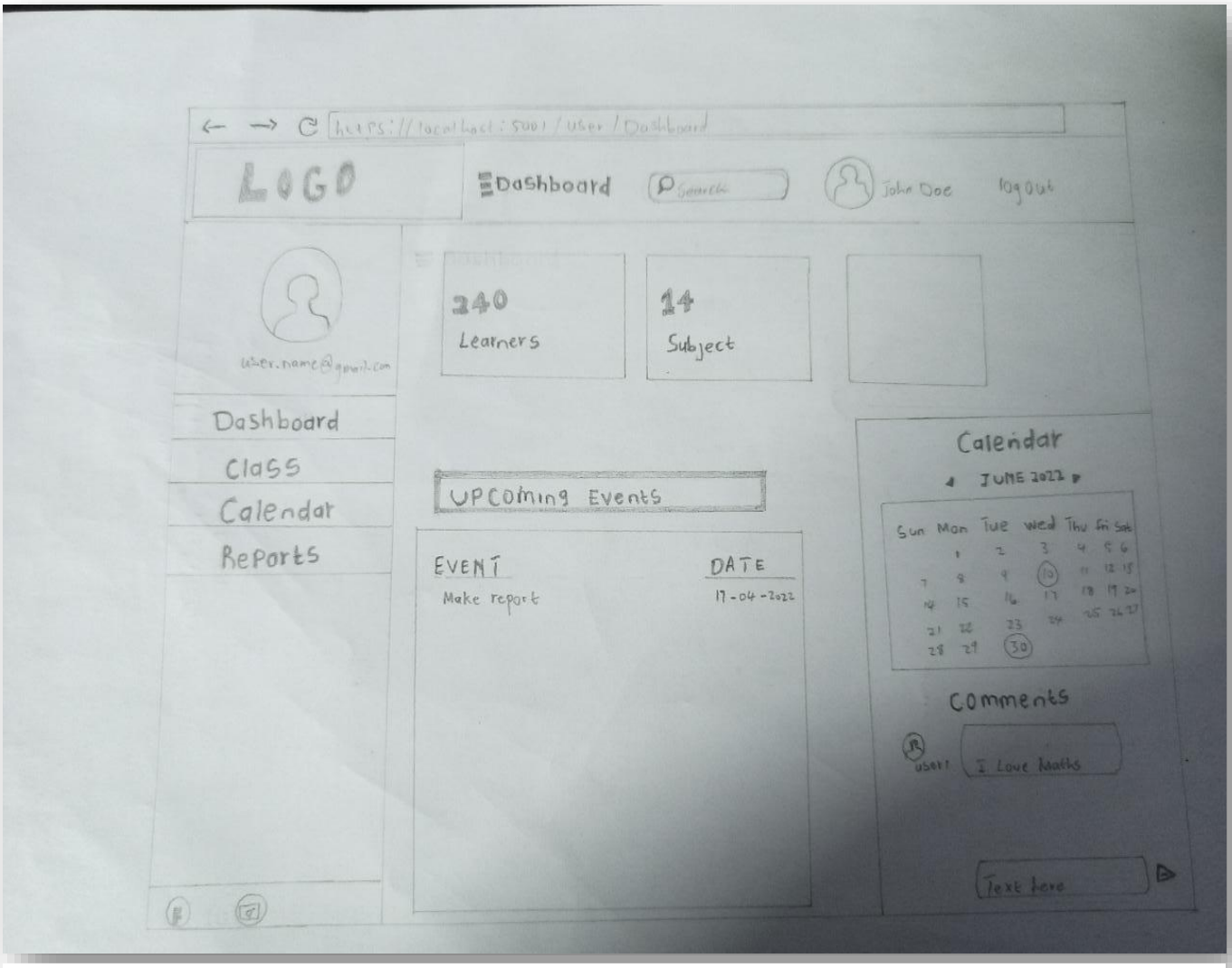
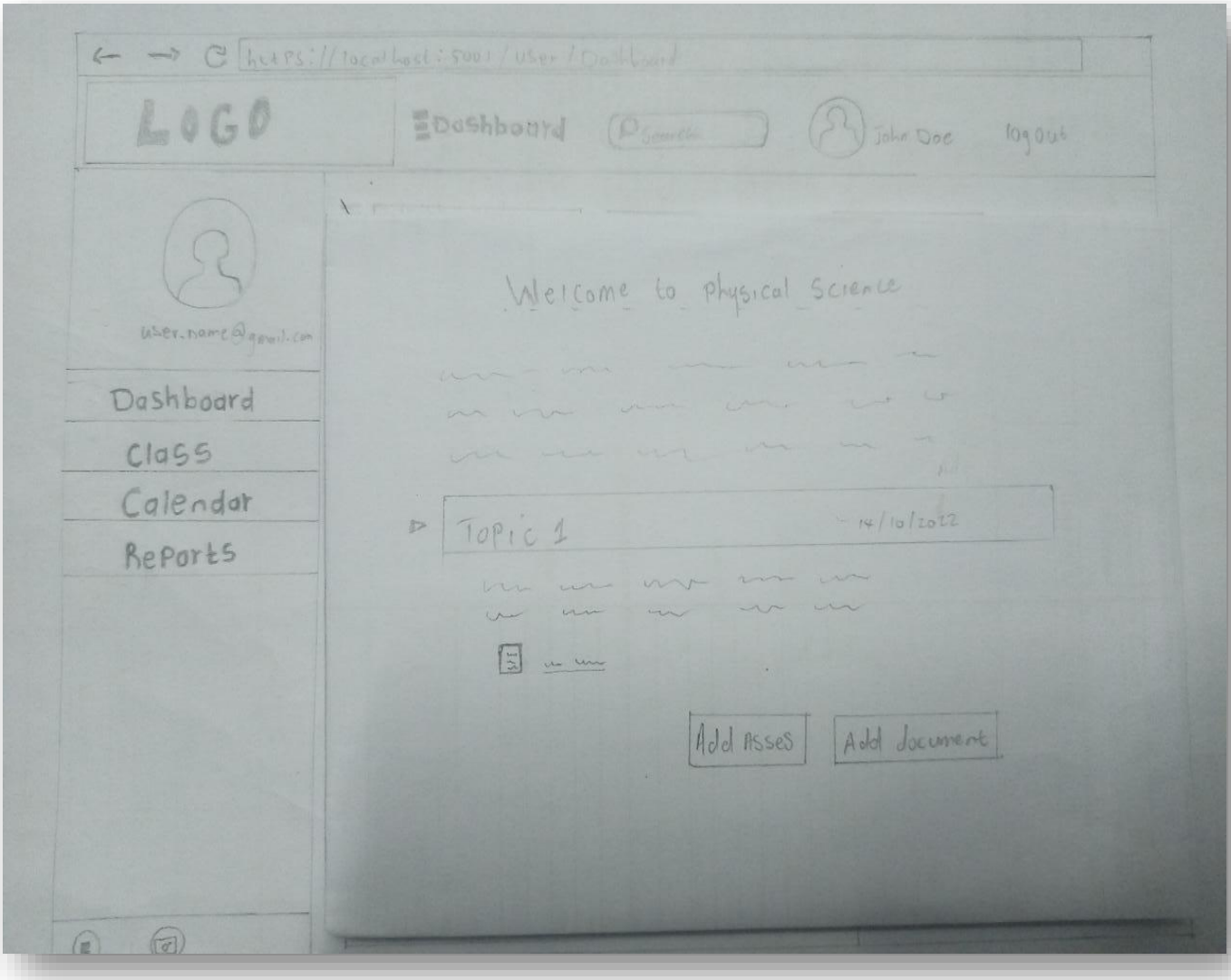


Figure 5: Teacher low fidelity prototype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LOGO
Dashboard
John Doe
logout
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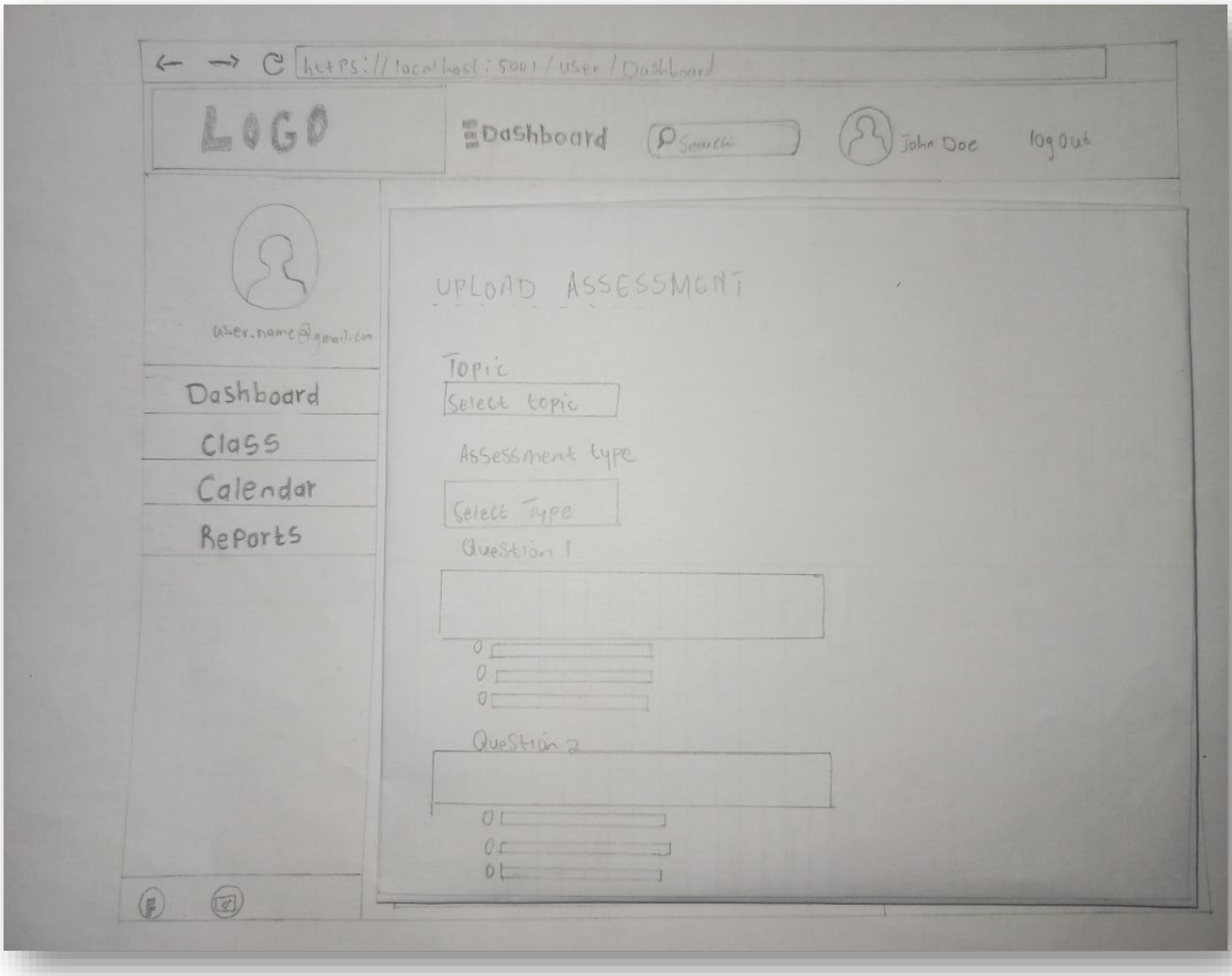
Dashboard
Class
Calendar
Reports
Welcome to physical Science
Topic 1
14/10/2022
Add Asses
Add Document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LOGO
Dashboard
Search
John Doe
log Out
user.name@gmail.com
Dashboard
Class
Calendar
Reports
UPLOAD ASSESSMENT
Topic
Select topic
Assessment type
Select Type
Question 1
Question 2