COS20001: User-Centered Design

10.1) Results and Problem Identification

Group 4

Introduction

The usability evaluation with the supportive participants has provided us with valuable reflections and experience to improve our prototype and evaluation techniques. In this document, we will investigate the overall process of the controlled usability evaluation and identify the fruitful results and recommendations for improvement as well as the existing problems that need to be fixed before the official release of final product.

Part 1: Summary of collected data

1. Participant Demographics

The data collected in our first form (Pre – study Questionnaire) gives an insight into whether the test users are our targeted customer group. The table below shows the collected data (see Figure 1).

ID	Age	Gender	Occupation	Education	Phone Ownership	Have used quiz?	Methods to review knowledge
001	18 - 24	Female	Student	Bachelor's Degree	3 – 5 years	Yes (always)	1, Read document 2, Study notes 3, Quiz app
101	18 - 24	Male	Student	High school, no diploma	3 – 5 years	Yes (always)	1, Read document 2, Quiz app
988	18 - 24	Female	Student	High school, no diploma	5 years +	Yes (few)	1, Read document 2, Study notes 3, Quiz app
114	18 - 24	Male	Student	Bachelor's Degree	3 – 5 years	Yes (few)	1, Read document 2, Study notes 3, Quiz app 4, Weekly review
013	18 - 24	Male	Student	High school graduate	5 years +	Yes (few)	1, Read document 2, Briefly before test 3, Quiz app 4, Weekly review

Figure 1: Demographic Table

Considering the above demonstration, all of 5 test users belong to the targeted user group. This can be easily explained since our given test users are university students, who usually incorporate gamified educational applications to their study.

2. Results

The measurement of the effectiveness of each task is demonstrated in the tables. The data in the table is carefully collected from re – watching real and confidential footage of the interviews.

Task 1: Create an account using your account with a chosen username and password to gain access to our platform.

ID	Unassisted Task Completion	Errors	Assists	Task Completion Time
001	100	0	0	20s
101	100	0	0	15s
988	100	0	0	17s
114	100	0	0	18s
013	100	0	0	23s

Figure 2: Task 1 result

Task 2: Customize your profile and personalization.

ID	Unassisted Task Completion	Errors	Assists	Task Completion Time
001	0	0	2	30s
101	0	0	1	30s
988	100	0	0	28s
114	0	0	2	60s
013	100	0	0	27s

Figure 3. Task 2's result

Task 3: Create some quizzes using the register account.

ID	Unassisted Task Completion (%)	Errors	Assists	Task Completion Time
001	0	0	2	60s
101	100	0	0	25s
988	0	0	0	30s
114	0	1	1	40s
013	100	0	0	35s

Figure 4. Task 3's result

Task 4: Create a course using the register account.

ID	Unassisted Task Completion (%)	Errors	Assists	Task Completion Time
001	0	0	1	60s
101	100	0	0	20s
988	0	0	1	30s
114	100	0	0	22s
013	100	0	0	25s

Figure 5. Task 4's result

Task 5: Delete the account

ID	Unassisted Task Completion (%)	Errors	Assists	Task Completion Time
001	100	0	0	45s
101	100	0	0	15s
988	0	0	1	30s
114	0	0	2	45s
013	100	0	0	20s

Figure 6. Task 5's result

3. Satisfaction measures

The data of the difficulty rating for each task of each user is represented in the table below. Moreover, the System Usability Scale Score (SUS) is calculated for each user (see Figure 7).

ID	Task 1's Rating	Task 2's Rating	Task 3's Rating	Task 4's Rating	Task 5's Rating	SUS score	Recommend to a friend
001	1	2	2	2	2	80	Yes
101	1	1	1	1	1	77.5	Yes
988	2	2	3	4	3	87.5	Yes
114	1	2	3	1	3	62.5	Yes
013	1	1	2	2	1	70	Yes

Figure 7. Satisfaction Table

For the SUS score, we targeted to achieve 72 or above and we have achieved this with 3/5 of our users.

Task 1: Create an account is considered by our team to be the easiest and the real data showed that all participants completed this task without any difficulty.

In contrast, Task 3 and Task 4, which is Create a Quiz and Create a Course respectively, appeared to impose many difficulties on the users. Mostly the problem is about the navigation to the correct page. We had predicted this in our Usability Requirement since we were only expecting around 62% for these two tasks.

Task 2: Customize your account is considered fairly easy and straight forward by our team. However, some particular users had difficulties navigating from the Home page to the Account Setting page.

Overall, we are satisfied with our SUS score, which exceed our expectations. The high result can be attributed to our thorough preparation and clear instructions given to the participants during the evaluation. However, our lack of experience when conducting the evaluation still results in high level of interference with the users when they perform their task. Although this slightly influenced the result of the evaluation, our interface has proven to be effective and user – friendly.

4. Comment

In our Post – study Questionnaire 1, we have collected some comments about the users' experience (see Figure 8).

ID	Like MOST about the prototype	Like LEAST about the prototype
001	The message function, Account setting	Design (the color)
101	It is clear, easy to use and understand	Not very attractive
988	The creating course and quiz's function	I'm not having any negative feelings on this prototype at all. Personally, I just would love it to shift to another eye-catching theme color
114	I like the given theme color, it's decent and give me a fresh spirit to do my job.	I think the design it's a little bit too crowded, messy, and hard to follow
013	I love your team design and this app is interesting	It's a little slow when I use

Figure 8: Users' comments and thoughts

Test user with ID 114 shared some thoughts after the evaluation:

"I think your app is good and I like to do it. Just try to improve it and maybe I will be your first customer"

Part 2: Identified problems and solutions

The overall satisfaction of the users when they first interacted with our prototype was fairly high, participants are interested in the functionalities of the prototype. One of the appreciated features in our design lies in the core of our concept, better user optimization, and customization. The users were impressed that they can change everything with the interface including the background picture, music, themes, and even colors. However, although we have implemented a lot of features to allow users to customize our platform, some of the implementations did not work as planned and there was no instruction to guide the users. Moreover, there is also a lot of room for improvement in terms of design and flow of work.

Technical problem

Technical problem #: 1

Evaluator feedbacks: "The idea of prioritizing customization and personalization is great; however, I don't see it being illustrated and facilitated just yet in this prototype"

Evaluator information:

Timestamp	Email address	Occupation	Link to agreement
7/18/2022 15:45:52	lehuutuong03@gmail.com	College student	Link

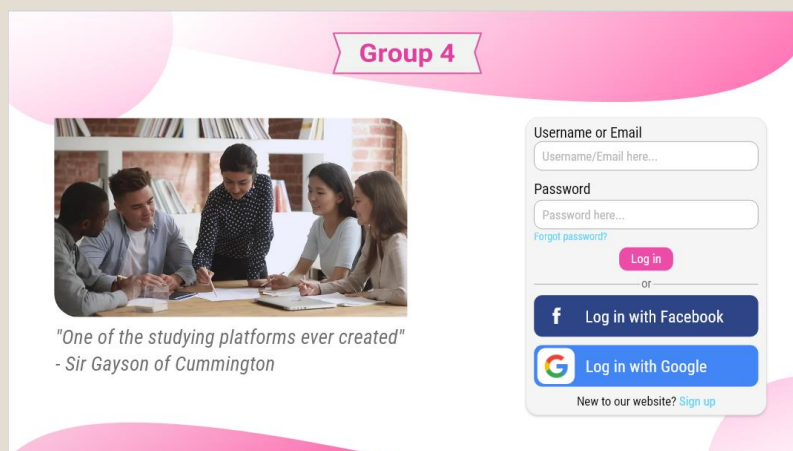**Prototype screen, page, location of problem:** Profile page and setting.

[Quăng 1 hình trong profile page, 1 hình setting. Ghi caption là [tên page]

Name of heuristic: Consistency and standards

Reason for reporting as negative or positive: Some functionalities that facilitates users' personalization and customization was not completed.

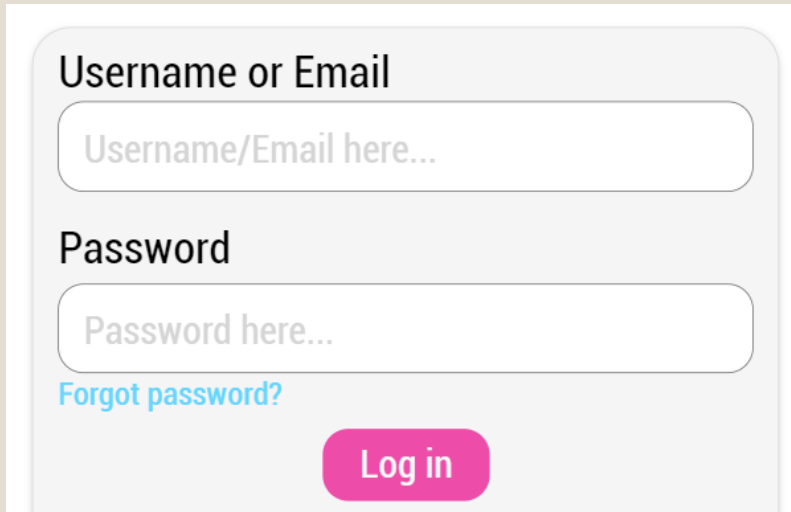**Severity of problem (scale 0-4):** 3: Major problem.

- **Frequency (common – rare):** Common.
- **Impact (easy – difficult to overcome):** Difficult to overcome.
- **Persistence (one-time – ongoing problem):** ongoing problem.

Justification for severity rating: Personalization and customization are the two main concepts of our modification of Quitch, as Quitch offer little to no option for users to customize their platform. That is one of, if not the most important feature

that we want to bring to our user; therefore, it is quite severe if the users do not know the existence of these features or if they can not use these features to its finest.

Suggestions to fix: Various features that facilitate users' customization and personalization should be fixed and there should be a tutorial to guide the users.

Solution from our team: After receiving this feedback, our team has fix all the malfunctioning features and provide the users with a guide to introduce them to our platform.

Before and after screenshot

[Quăng 1 hình page đầu tiên không có guide và hiền after là có guide]

Technical problem #: 2

Evaluator feedbacks: "I cannot type in my information in the log in and registration box."

Evaluator information:

Timestamp	Email address	Occupation	Link to agreement
7/18/2022 15:39:52	lehuutuong03@gmail.com	College student	Link

Prototype screen, page, location of problem: Login page and Registration page.

Figure 1.1. Log in Page

Figure 4.2. Sign Up page

Name of heuristic: Error prevention.

Reason for reporting as negative or positive: The log in page does not allow participants to type in their information.

Scope of problem: Log in and registration page.

Severity of problem (scale 0-4): 4: Usability Catastrophe

- **Frequency (common – rare):** Common.

- **Impact (easy – difficult to overcome):** Difficult to overcome.

- **Persistence (one-time – ongoing problem):** Ongoing problem.

Justification for severity rating: Although this is just a prototype, the testing process with our evaluators was severely affected as they were not able to type in the information both in log in and in registration pages. The evaluators were, consequently, had to use a provided account to continue the evaluation process.

Suggestions to fix: Add a text field for the users to provide their information.

Solution from our team: The feedbacks provided by evaluator were as critical as it is helpful for our team, after receiving the information, we have immediately added a text box to the log in page and registration page so that other evaluators can provide their information.

Before and after screenshots:
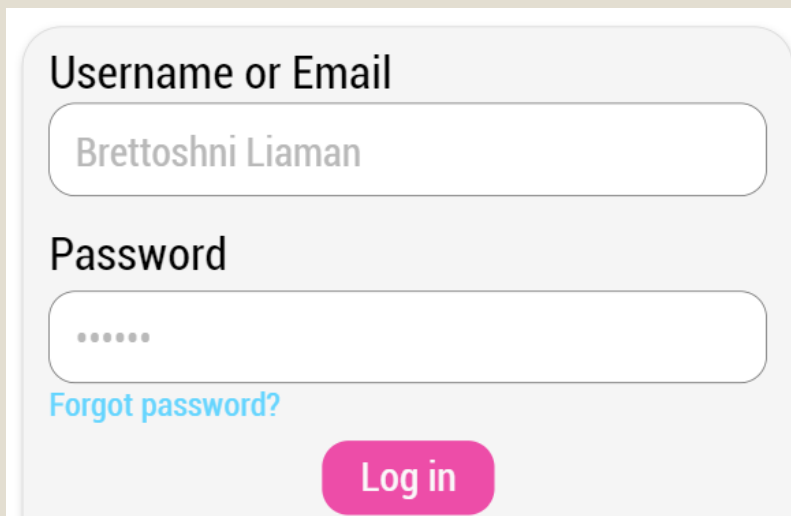
Figure 4.3.1. Login before input.
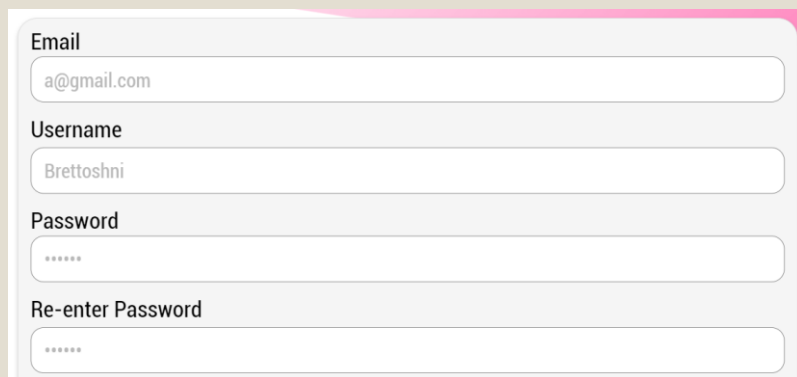
Figure 4.3.2. Login after input.

Figure 4.4.1. Sign Up before input.

Figure 4.4.2 Sign Up after input

Technical problem #: 3

Evaluator feedbacks: "I cannot log in via Facebook or Gmail."

Evaluator information:

Timestamp	Email address	Occupation	Link to agreement
7/18/2022 15:37:49	khanhqnvsws00068@fpt.edu.vn	College student	Link

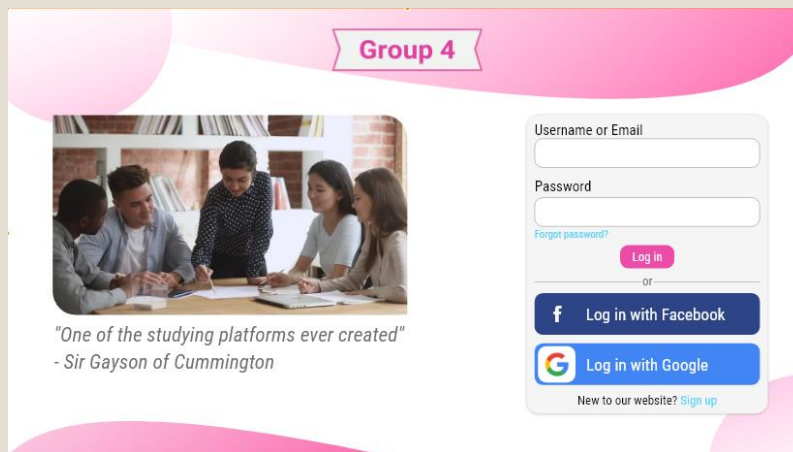**Prototype screen, page, location of problem:** Log in page.

Figure 5.1. The "Log in with Facebook" and "Log in with Google" did not have any follow-up page

Name of heuristic: Consistency and standards

Reason for reporting as negative or positive: The log in page does not allow participants to sign in using Facebook account or Gmail account.

Scope of problem: Log in page.

Severity of problem (scale 0-4): 2: Minor problem.

- **Frequency (common – rare):** Rare.

- **Impact (easy – difficult to overcome):** Easy to overcome.

- **Persistence (one-time – ongoing problem):** one-time problem.

Justification for severity rating: There are buttons to provide users with the ability to sign into the platform via Facebook and Google; however, the buttons do not seem to work.

Suggestions to fix: Fix the function of the button.

Solution from our team: The feedback from the evaluators is extremely helpful to help our team to recognize the flaws in our system, after receiving this feedback, we immediately fix the buttons so that it would work normally.
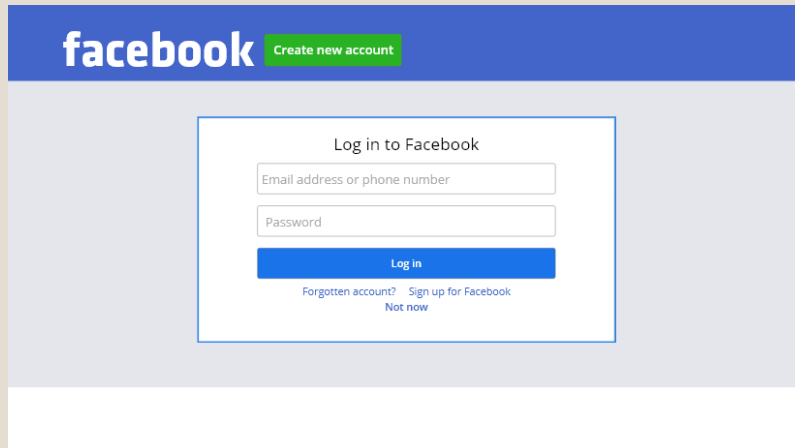
Before and after screenshots:

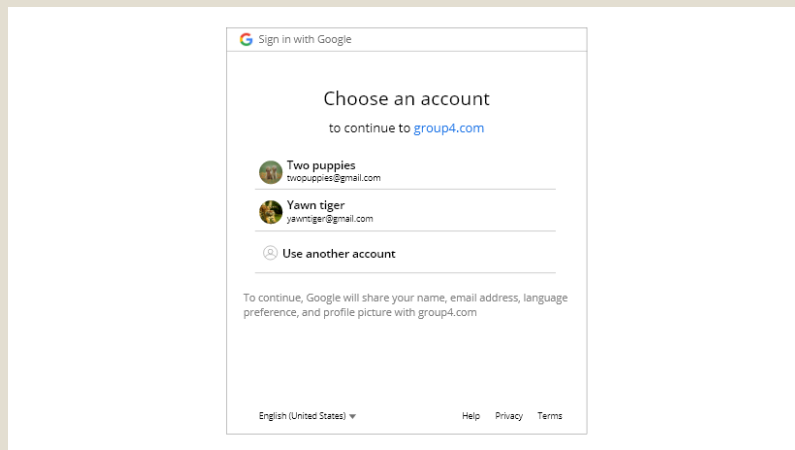*Figure 5.2. Logging in with Facebook, a page previously not present*

Figure 5.3. Logging in with Google

Technical problem #: 4

Evaluator feedbacks: "Some buttons do not work or malfunction, the back button and the publish button on the quiz creation page for example."

Evaluator information:

Timestamp	Email address	Occupation	Link to agreement
7/18/2022 15:40:38	khanhqnvsws00068@fpt.edu.vn	College student	Link

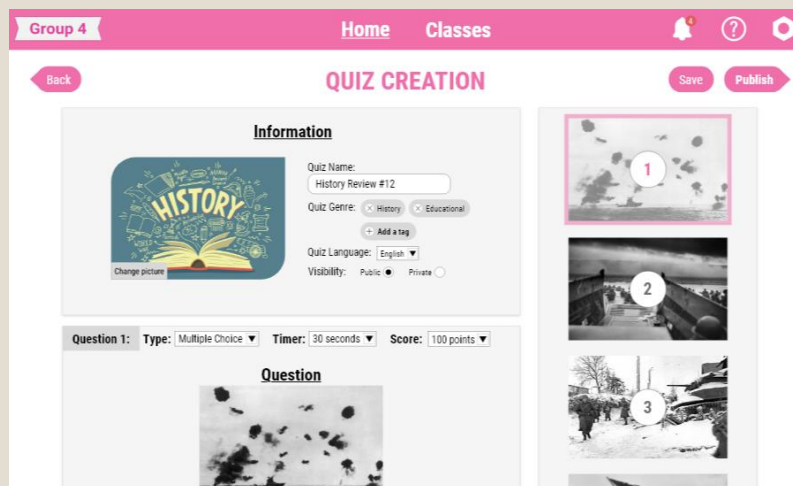**Prototype screen, page, location of problem:** Quiz page.

Figure 2. The Quiz Creation page's Back button did not function properly.

Name of heuristic: Consistency and standards

Reason for reporting as negative or positive: Some buttons do not work and some of them malfunction.

Scope of problem: Quiz page and quiz creation page.

Severity of problem (scale 0-4): 2: Minor problem.

- **Frequency (common – rare):** Common.
- **Impact (easy – difficult to overcome):** Easy to overcome.
- **Persistence (one-time – ongoing problem):** one-time problem.

Justification for severity rating: Some buttons, for example, the "back" button malfunctions and does not lead the users to their desired page. There are also a handful of buttons that do not work.

Suggestions to fix: Fix the function of the button or add function to the button that does not work.

Solution from our team: The feedback from the evaluators is extremely helpful to help our team to recognize the flaws in our system, after receiving this feedback, we immediately fix the buttons so that it would work normally.

Before and after screenshots:
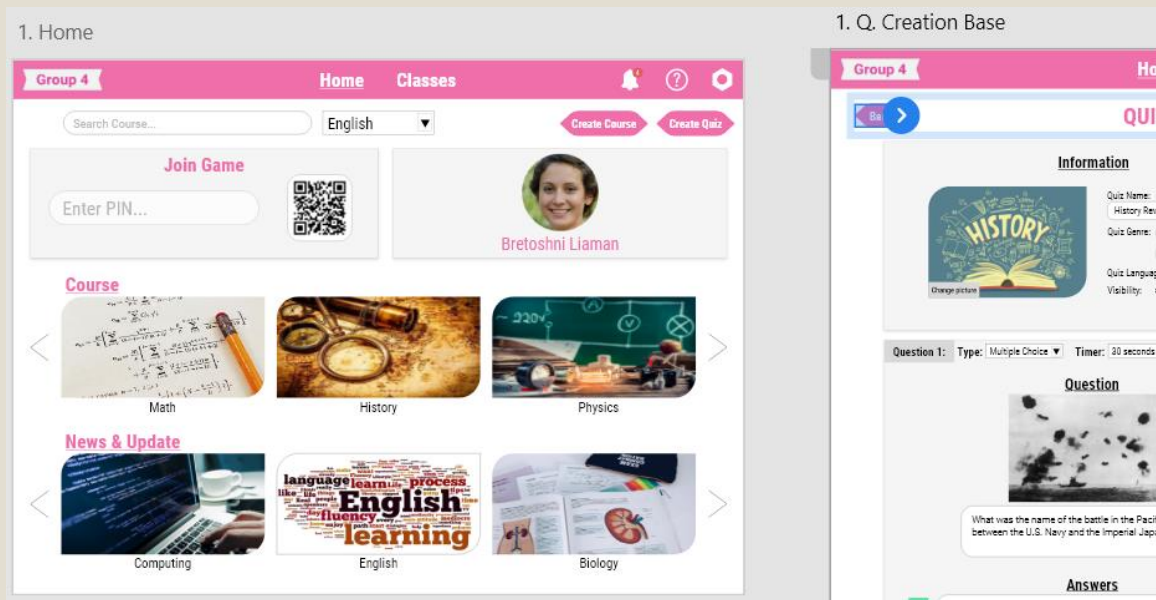
Figure 3.2. The button "Back" not linking to Homepage
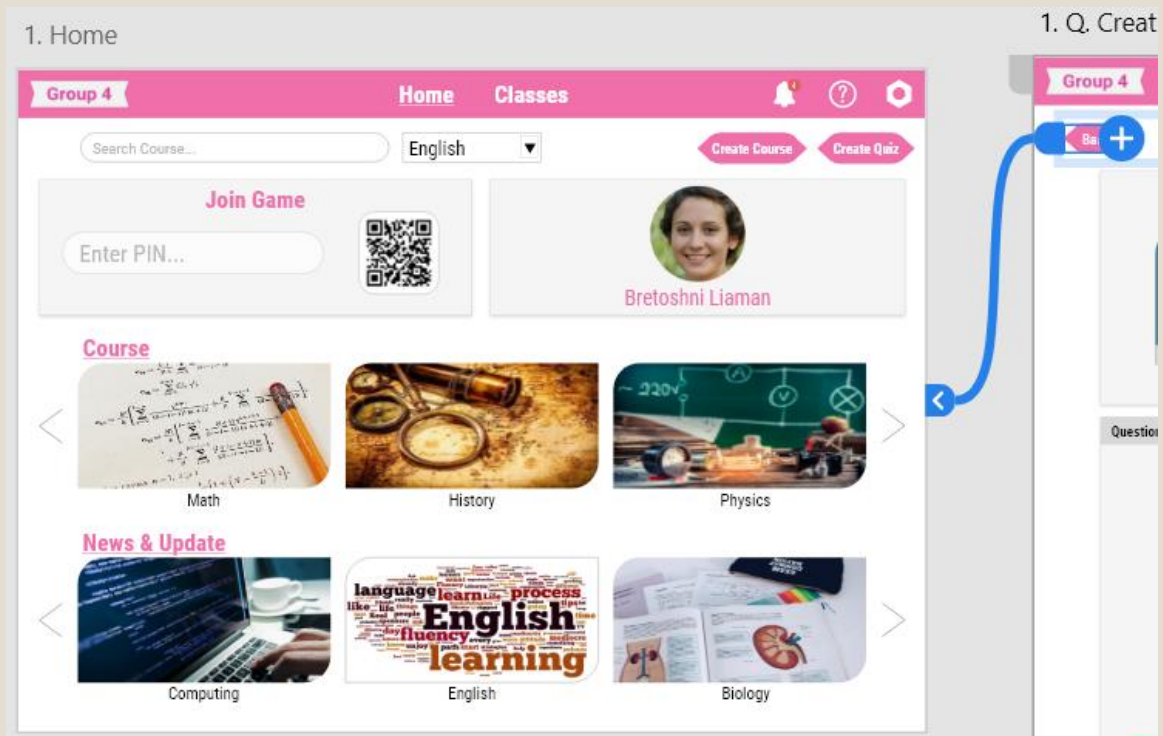
Figure 6.3. The button "Back" linked to Homepag

Technical problem #: 5

Evaluator feedbacks: "The theme changing function does not work."

Evaluator information:

Timestamp	Email address	Occupation	Link to agreement
7/18/2022 15:43:55	phamvunguyennhi@gmail.com	College student	Link

Prototype screen, page, location of problem: Profile page.

Figure 4.1. Themes option
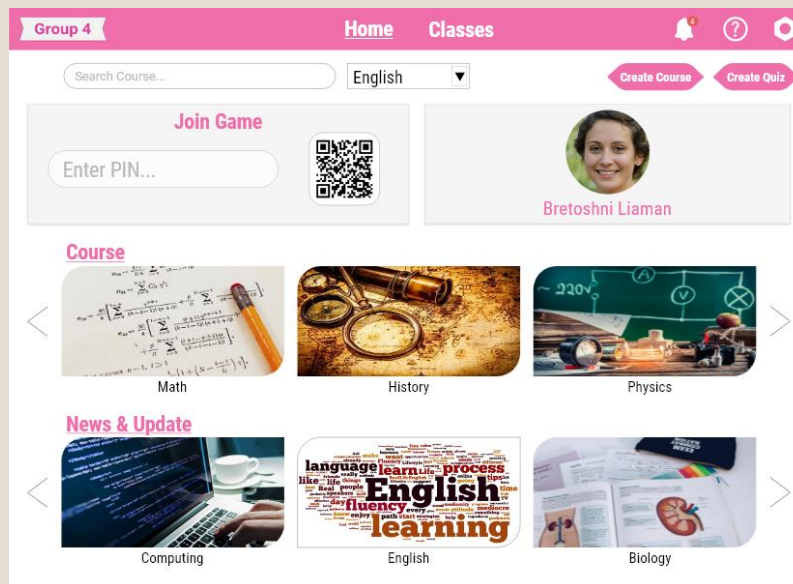
Figure 7.2. The default theme, while the settings had a themes option it was not functional.

Name of heuristic: Consistency and standards

Reason for reporting as negative or positive: The theme changing function on profile page does not work.

Severity of problem (scale 0-4): 2: Minor problem.

- **Frequency (common – rare):** Common.

- **Impact (easy – difficult to overcome):** Easy to overcome.

- **Persistence (one-time – ongoing problem):** one-time problem.

Justification for severity rating: Our time primary and utmost objective in this project is to improve users' customization and personalization ,and theme changing is one of the most important functions. Therefore, the fact that the theme was not able to change is a serious matter.

Suggestions to fix: Fix the function of the button or add function to the button that does not work.

Solution from our team: The feedback from the evaluators is extremely helpful to help our team to recognize the flaws in our system, after receiving this feedback, we immediately fix the theme changing function so that it would work normally.

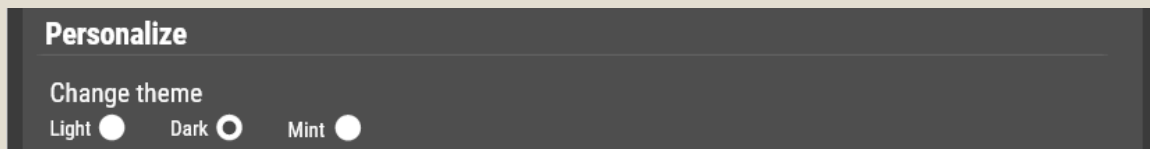**Before and after screenshots:**

Figure 7.3.1. Dark theme selected

Figure 7.3.2. Dark theme active

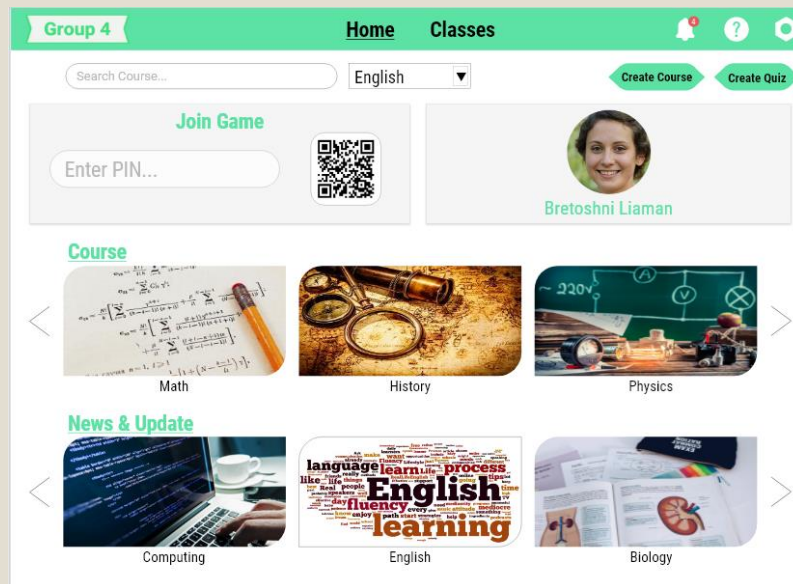*Figure 7.4.1. Mint theme selected*

Figure 7.4.2. Mint theme active

Part 3: Discussion of limitation of study

Apart from the technical side of the evaluation, we also encountered various problems that is related to the process or human factor, we realized these problems after some feedbacks from the lecturer as well as self-evaluation from within our team. Some of the noteworthy difficulties and insufficiencies are as follows:

Process problem #: 1

Problem description: The users took quite long time before they could grasp the core value of our team and the evaluation.

Reason for the problem: Our team did not provide a thorough and methodical introduction for the users; therefore, we had had to explain to them before the evaluation could begin.

Solution from our team: Our team will prepare a basic yet organized introduction so that the users could grasp the main point in future evaluation.

Process problem #: 2

Problem description: All the participants were evaluated in the same place, which was quite noisy and disorganized.

Reason for the problem: After some perusal from our team, we noticed that the audio quality in the videos from the evaluation was poor due to the noise from other evaluators. Although this did not affect the evaluation process, but it would become a problem if we wanted to have a look later.

Solution from our team: It has been decided that in the future evaluation, all the members in our team will conduct our evaluation in different rooms or different places in order to avoid this problem from reoccurring.

Process problem #: 3

Problem description: Bias when interacting with participants.

Reason for the problem: Although we had agreed and practiced to not being bias when interacting with participants, some of our team members was still unintentionally biased and told the participants how to complete the tasks.

Solution from our team: After the perusal of the evaluation video and data, we had had a self-evaluating meeting to bring up and solve the remaining problems. The

reason for this problem was that we had little to no experience in usability evaluating prior to this course, these problems were recognized by our team, and we will learn from this incident to make better preparation in the future.

Other objective matters

We had discussed about the technical problems as well as the process problems; however, there were also some objective matters that occurred in our evaluation process such as:

+ The participants were not prepared to conduct the evaluation in English.

+ The participants refused to be recorded and refused their data being taken.

+ The recording of the participants after the evaluation was corrupted and could not be viewed.

+ The recorded data was missing.

+ Our team members evaluated the same participant without knowing.

These matters were later fixed; however, we still have to look back to these problems and prepare ourselves better in future evaluation.

Part 4: Raw data

The raw data collected during the evaluation process are as follows:

Timestamp	Email address	Confirmation
7/18/2022 15:37:49	khanhqnvsws00068@fpt.edu.vn	Yes
7/18/2022 15:39:18	lehuutuong03@gmail.com	Yes
7/18/2022 15:40:38	trangndsws00170@fpt.edu.vn	Yes
7/18/2022 15:43:55	phamvunguyennhi@gmail.com	Yes
7/18/2022 16:14:36	phamminhhung120903@gmail.com	Yes

Figure 1: Evaluation explanatory statement

ID	Age	Gender	Occupation	Education	Phone Ownership	Have used quiz?	Methods to review knowledge
001	18 - 24	Female	Student	Bachelor's Degree	3 – 5 years	Yes (always)	1, Read document 2, Study notes 3, Quiz app
101	18 - 24	Male	Student	High school, no diploma	3 – 5 years	Yes (always)	1, Read document 2, Quiz app
988	18 - 24	Female	Student	High school, no diploma	5 years +	Yes (few)	1, Read document 2, Study notes 3, Quiz app
114	18 - 24	Male	Student	Bachelor's Degree	3 – 5 years	Yes (few)	1, Read document 2, Study notes 3, Quiz app 4, Weekly review
013	18 - 24	Male	Student	High school graduate	5 years +	Yes (few)	1, Read document 2, Briefly before test 3, Quiz app 4, Weekly review

Figure 2: Prestudy demographic questionnaire

Timestamp	Participant ID (we will tell you what to put for this Que	What did you like most about the protot	What did you like least about the protot	Do you like creating quiz in our applica	Do you think the "create course" feature is necess
7/18/2022 15:51:42	101	it is clear, easy to use and understand	not very attractive	yes	yes
7/18/2022 15:52:36	13	love your team design and this app is interesting	It's a little slow when i use	Yes, it's fun	think yes too, it make me feel free to create my own cours
7/18/2022 15:53:50	1	The message function, Account setting	Design (the colour)	Maybe	yes of course
7/18/2022 16:00:37	10389988	The creating course and quizzes function	this prototype at all. Personally, I just would lo	Yes, definitely	For me, it is really necessary
7/18/2022 16:27:09	114	theme color, it's decent and give me a fresh spiri	design it's a little bit too crowded, messy and ha	yes, I do. It's a lot easier than Kahoot	it depends on the people who I am dealing with
7/20/2022 13:37:49	114	theme color, it's decent and gives me a fresh spi	design is a little bit too crowded, messy and har	yes, I do. It's a lot easier than Kahoot	It depends on who I am working with

Figure 3: Post-study questionnaire 1

Timestamp	l you	e to u	m un	ysten	a tec	s in t	nuch	would	n very	dent	befo
7/18/2022 15:54:04	101	3	2	5	2	3	2	4	2	5	1
7/18/2022 15:54:45	1	2	2	5	1	4	2	5	3	5	1
7/18/2022 16:02:03	988	4	1	5	2	5	2	5	3	5	1
7/18/2022 16:28:36	114	3	2	3	3	3	2	3	3	4	1

Figure 4: Post-study questionnaire 2

Time stamp	ID	Task 1	Task 2	Task 3	Task 4	Task 5
7/18/2022 15:49:01	101	1	1	1	1	1
7/18/2022 15:55:35	1	1	1	1	1	1
7/18/2022 16:24:19	13	1	3	3	2	4
7/19/2022 10:58:32	114	1	2	3	1	3
7/20/2022 14:12:37	988	2	2	3	4	3

Figure 3: Task evaluation data