

IMPROVING STUDENTS' UX IN ONLINE LEARNING PLATFORM

Case study: LAB Faculty of Business and Hospitality Management

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Thao Nguyen

Abstract

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Title of publication Improving Students' UX in online learning platform Case study: LAB Faculty of Business and Hospitality Management		
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<p>Over the past months, online studying has become popular among a great number of educations. However, the user experience stays still. Therefore, this study was conducted to solve its issues in the online learning platform.</p> <p>The purpose of the study was to deploy an approach to users about online learning experience. The thesis presents the LAB Faculty of Business and Hospitality Management case study, whose target users are students at LAB.</p> <p>The main goal of this thesis is to identify the current challenges of students who are using the Reppu - online learning platform and solve the fundamental root problems. For the final results, this study implements a deductive research approach. It uses qualitative and quantitative methods to collect data from users.</p> <p>By applying the new design to the online learning platform, the author was able to predict the improvement concerning user experience. Constructive research led to the redesign process. It might help students pay more attention and invest more time in online classes.</p>		
Keywords User Experience, online learning, learning platform, design thinking, user-centered design		

CONTENTS

1	INTRODUCTION	1
1.1	Research background	1
1.2	Thesis objectives and research questions	1
1.3	Thesis structure	2
2	RESEARCH DESIGN	3
2.1	Research approach	3
2.2	Research methods	3
2.3	Data collection and data analysis.....	3
3	THEORETICAL FRAMEWORK	5
3.1	User Experience	5
3.1.1	UX definition	5
3.1.2	UX elements	6
3.1.3	Principles for a good UX design.....	7
3.1.4	Why does UX matter?	9
3.2	Visual Design.....	9
3.2.1	Typography.....	9
3.2.2	Colors.....	10
3.2.3	Images	10
3.2.4	Consistency	11
3.3	The psychology in UX design.....	11
3.4	Defining other important concepts	12
3.4.1	Online learning platform	12
3.4.2	Iterative design process	12
4	COMMON UX STRATEGIES	14
4.1	User-centered Design.....	14
4.2	Design Thinking.....	14
5	UX DESIGN PROCEDURES	16
5.1	Research.....	16
5.1.1	User survey.....	16
5.1.2	User interview.....	16
5.2	Research results.....	17
5.2.1	User survey results.....	17
5.2.2	User interview results	21
5.3	Heuristic evaluation	23

6	IMPLEMENTING UX DESIGN	27
6.1	Ideate	27
6.1.1	Information architecture.....	27
6.1.2	Wireframing	27
6.1.3	Visual design	31
6.2	High fidelity design	33
6.3	Usability testing.....	38
7	RESULTS AND SUGGESTION OF THE ITERATIVE PROCESS	42
8	CONCLUSIONS	43
	LIST OF REFERENCES	44

1 INTRODUCTION

1.1 Research background

Thanks to the rapid development of technology, online studies has become an essential part of many academic institutions. According to the statistics investigated by Andrej Bastrikin (2020), there were 6.6 million students taking part in some forms of online learning courses in 2017. The benefits of online studying are inarguable. It connects individuals with courses across the world. Instead of booking a room and coming to the location with face-to-face interactions, students can join distance learning, which is a new method of study. It delivers an opportunity for students living anywhere to attend classes at the same time. Participants can discuss, send, and receive information in real-time. An online course offers various interactive opportunities compared to traditional classes: sharing video and presentation (lectures), chat, surveys, screen sharing, recording, call to action, test.

Before the birth of UX design, we used to make a website based on just two things: what we like and what the client wanted to see (Jacob 2010). With the increase of user and technology's development, its platform becomes so complex and redundant. Nowadays, users have been using many devices to access the online learning platform with different screen sizes and internet connection types. The demand for having a greater user experience design is increasing.

The thesis target was set to improve how students at LAB feel about the online learning experience. By recognizing the missing and nonfunctional parts, the research concentrates on enhancing UX in using and controlling the Reppu online learning platform at LAB.

1.2 Thesis objectives and research questions

Studying without physical interaction requires adequate self-discipline and concentration. Correspondingly, UX design for e-learning is indispensable in improving the value, accessibility, and desirability in the interaction with lessons. It plays an important role in defining a great user experience for learners. During the study, a majority of interviewees indicated that the online platform at the LAB has several drawbacks and limitations that caused frustrations and lowed ability of retention. Based on the finding after answering the research questions, the redesigned system was proposed to help students obtain the provided value completely.

The thesis aims to answer the following research questions:

How can User Experience (UX) be used to benefit online learning at LAB?

Sub-question 1: Why does UX matter?

Sub-question 2: What is the procedure of UX redesign in improving the online studying platform at LAB?

Sub-question 3: How can UX be implemented in the online learning platform at LAB?

1.3 Thesis structure

The study contains eight chapters. Chapter 1 introduces a short proposal to the thesis topic and its background. In chapter 2, Research Design reveals the approach methods and an introduction to how data will be collected and utilized. Chapter 3 manages the concept of UX, visual design, psychology in UX design, and definition of other crucial concepts. Chapter 4 mentions common UX strategies in practical design. Chapters 5 and 6 implement UX design into the case study and show the result. Chapters 7 and 8 summarize the main heuristic solutions of this thesis. Figure 1 describes the structure of this study.

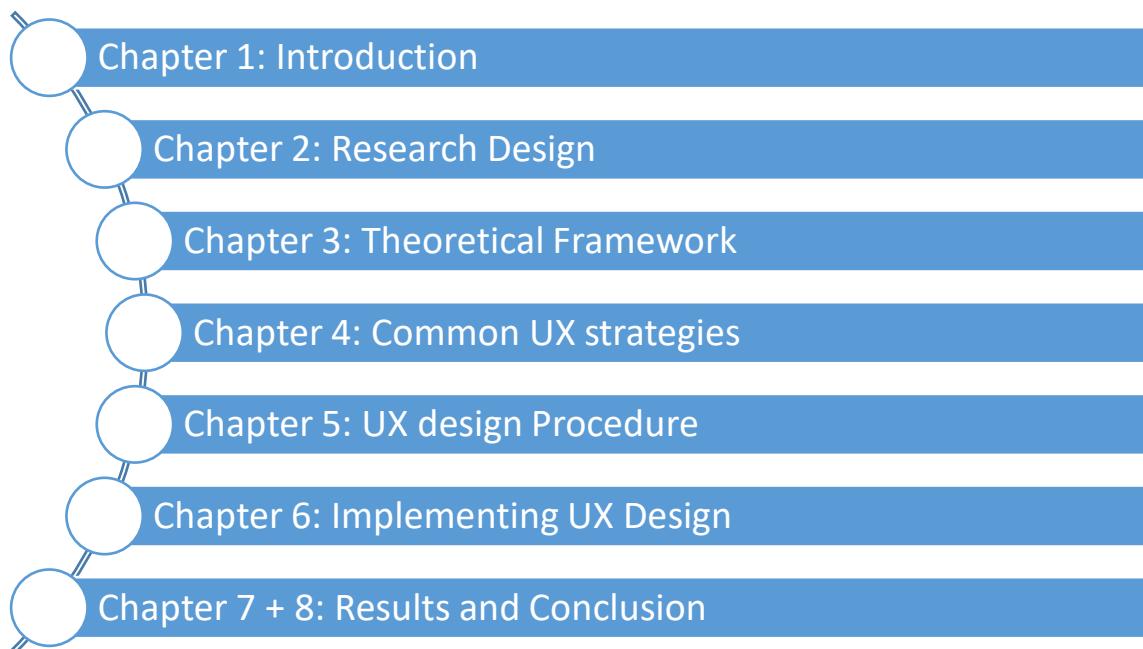


Figure 1 Structure of the study

2 RESEARCH DESIGN

2.1 Research approach

The research approaches are the method of processing existing data and theories to find conclusions, create predictions, or form interpretations. There are three main approaches that we use: deduction, induction, and abduction. (Butte College 2019.)

Deductive reasoning starts with general facts or premises and then conducts a specific inference. In contrast, induction uses specific observable evidence that leads to a general conclusion. Finally, abductive reasoning is drawing the best clarification for observation with incomplete data. (Life Lessons 2019.)

In this study, found data from existing theories and solution fills in the gaps of an existing case study. To answer the research questions, the reasoning was developed from the accustomed fact to the distinct application. As a result, the deductive approach is adopted and implemented.

2.2 Research methods

Considering the answers from questions, research methods are strategies used to collect data for research design. Choosing the right research methods and implementing them efficiently assures that the achieved knowledge helps explaining study questions completely.

The quantitative method and qualitative method are two common methods in research. Quantitative research gathers numerical data which is analyzed and measured through statistics. Differently, qualitative research collects data in terms of emotions, behaviors, and lived experiences. (the University of Newcastle Library guides 2020.)

Based on the type of data that needs to be developed, the chosen method for this thesis is mixed research. It is a combination of qualitative and quantitative methods. The research employed case study, literature reviews, interviews, surveys, focused groups, and observation within the framework of mixed methods.

2.3 Data collection and data analysis

Data collection is a procedure of gathering and analyzing observations or measurements from appropriate sources to figure out the answers for the research questions, check the hypotheses, and measure the results (Business Research Methodology 2020). There are seven forms of statistics: primary data, secondary data, cross-sectional data, categorical

data, time-series data, spatial data, and ordered data (Aryal 2019). The types of statistics lie under two comprehensive classifications: primary data collection and secondary data collection. Primary data collection is referred to as collecting the raw materials directly from the source. Conversely, secondary data compilation is the process of assembling announced knowledge by other researchers. (Formplus Blog 2020.)

According to the final purpose of achieved data, this thesis used primary statistics collection. With the help of questionnaires, the interviews were implemented and collected face to face responses. Several works have shown that the needed facts were conducted from books, research articles, and other relevant sources. A possible way to gather necessary data is using a mixed-method, which applies both primary and secondary data collection.

Last July, the researcher conducted personal interviews with eight students from LAB, who used the online platform for studying in spring 2020. The qualitative data was collected through direct meetings with a specific plan and questionnaire. During the interview, anonymous audio was recorded and stored for later transcriptions. Recording audio minimizes distorting the meaning of the interview. The thematic analysis method was utilized to interpret the meaning of patterns and keywords. From that perspective, students' experience in e-learning and their expectations for the course at LAB was taken into account.

To accumulate statistics for secondary data collection, a survey was administered to the international student community from other Universities across Finland. The released questionnaires with closed-ended and open-ended questions to the community student received 235 answers in total. To support the UX process, the research summarized the answers in the form of statistical tables and charts. The quantitative data was compared to LAB's and explained how UX can enhance online material platforms.

3 THEORETICAL FRAMEWORK

3.1 User Experience

3.1.1 UX definition

As experience is a general term along the lines of perception, sensation, or observation, the current UX definitions are diversified. According to the Interaction Design Foundation in 2020, user experience is an entire procedure where the creative team uses to generate products that provide significant and appropriate experience to users.

UX design is usually used equivalently with the terms “User Interface” and “usability”. However, it is important to distinguish the user experience from the user interface and usability, since user experience embraces all aspects of the interaction between users and products (Don Norman 2020). To create an outstanding product, user experience not only focuses on visual look or usefulness but also other prospects of satisfaction, productivity, and enjoyment. Therefore, the common principle and explanation of UX have not been acknowledged by other specialists (Law et al. 2009, 719-728).

There are several clear advantages investing in UX to support the product:

- User retention
- Customer acquisition and loyalty
- Lower assisting costs and higher revenue
- Increased productiveness
- Reducing development time and costs. (Zink 2017.)

3.1.2 UX elements

In product design, the user experience main elements are defined by Garrett (2011, 21-36) and called five UX planes, which are shown in Figure 2.

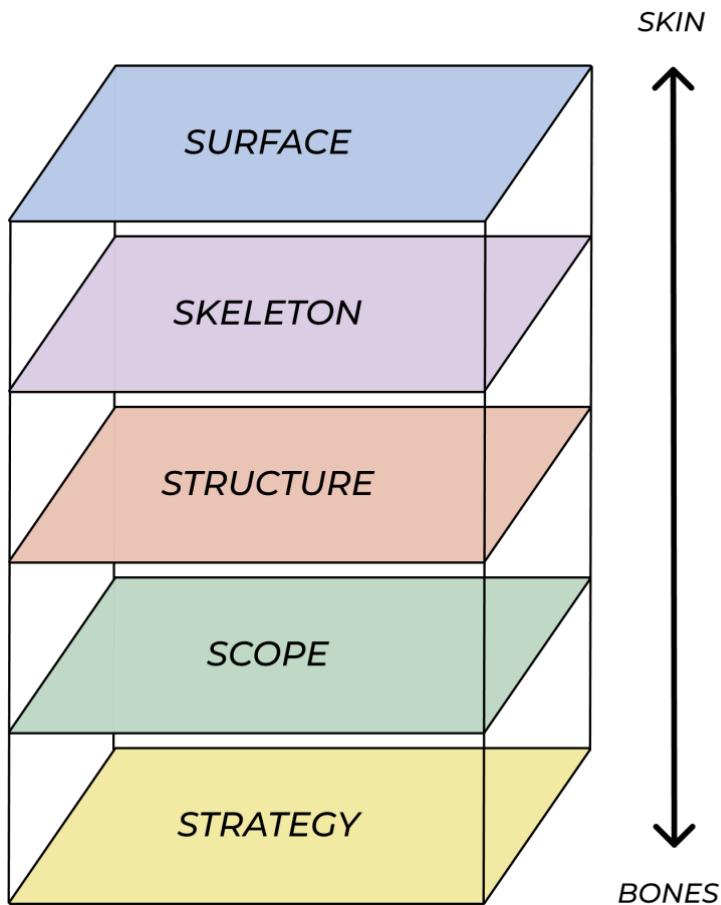


Figure 2 Five UX element planes

The Strategy Plane: Strategy Plane is where creators interview customers, and all stakeholders within the research phase. The strategy integrates user expectations and product goals.

- The Scope Plane: The scope follows business strategies. It identifies what functionalities and components are contained in the scope as well as what content should be implemented to be aligned with the critical objective.
- The Structure Plane: Structure interprets how components and functionalities fit together. The structure explains how users communicate with the product and how arrangement is.
- The Skeleton Plane: Skeleton is a solid clarification for the more abstract structure of products. It represents the visual form of the output, where the user interacts with all features that are available on the interface.

- The Surface Plane: Surface is the representative face of all the efforts and determinations. With the combination of visual components, the final look and feel are generated here.

3.1.3 Principles for a good UX design

The Interaction Design Foundation (2020) specifies UX fundamental principles as “advice for making easy-to-use, pleasurable designs as we select, create and organize elements and feature in our work”. Numerous principles need to be covered within the user experience. In this research, four core factors were chosen including information architecture (IA), usability, utility, and visual design.

The term “Information Architecture” (IA) is generally understood as the science of connecting users to the content of products in organizing and understandable ways (Ngai 2017). IA shapes a skeleton of the products so it can help users to accomplish certain objectives with less effort (Tubik Studio 2017). Organizing content with hierarchy makes navigation easy and explicit, so the user can easily move on the right path and feel satisfied. Well-implemented information architecture in UX design (Seth 2020) has four core components that can be illustrated in Figure 3:

- Organization System
- Labeling System
- Navigation System
- Searching System.

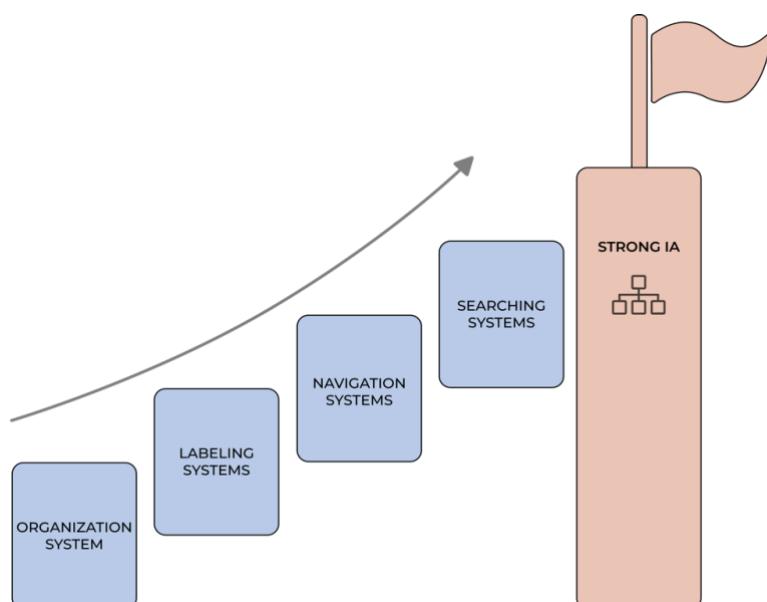


Figure 3 Four components for strong Information Architecture in UX design (adapted from Seth 2020)

ISO 9241 part 11 (1998) defines usability as the “effectiveness, efficiency, and satisfaction with which specified users achieve specified goals in particular environments”. Usability is usually used interchangeably for the UX. Although usability is an important contribution to UX, it is not the entire UX design. Usability represents how easy it is to achieve the goal by interacting with products.

Utility is usually confused with usability. It means the amount of good information that users can acknowledge from a product (Thornton 2019). If a product has useful functionality and meets the needs of users, it has a high utility.

The product frustrates users if it is difficult to explore the key features. Besides, useless goods disappoint customers even if they have informative manuals. A good website should have both to satisfy their customers. The relationship between usability and utility can be shown in Figure 4.

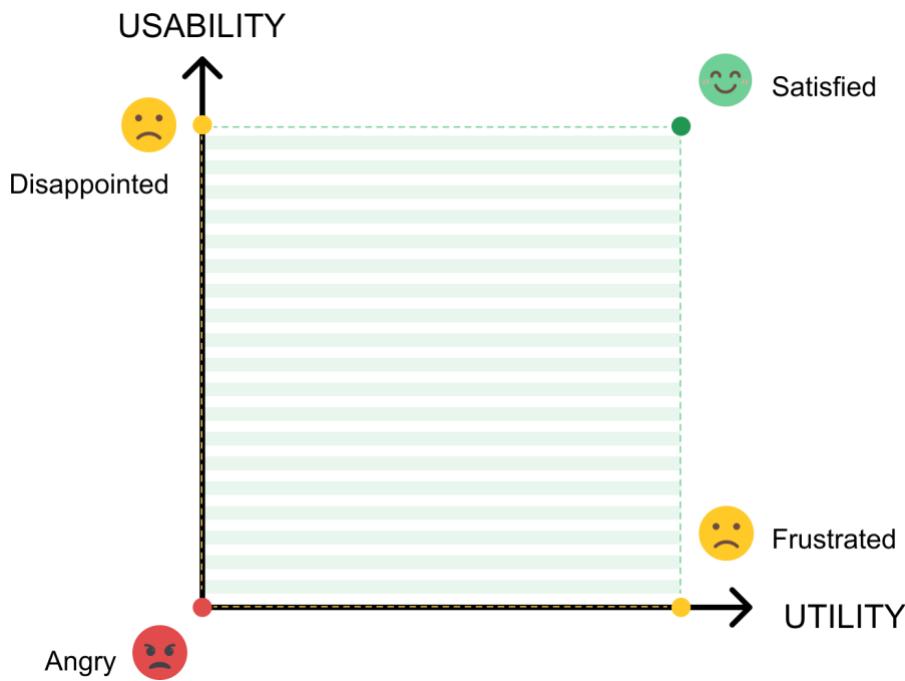


Figure 4 Connection between utility and usability (adapted from Thornton 2019)

The term “visual design” is fairly self-illustrative. It is described as utilizing the visual elements of products to impact on user interactions and behaviors (Ngai 2017). Visual design not only focuses on a good look but also is an identification of the company brand and image. A research by Myla S (2019) has shown that consumers are interested in products that have a better look and feel. They have an assumption that the products’ appearance and quality are conflated. In contrast, if the product follows all other areas of UX design, but it has the look and sense of a scam or spam one, users will believe that it is. The impact of the products’ look and feel can be seen in Figure 5.



Figure 5 Creating a great user experience (Metasite 2019)

3.1.4 Why does UX matter?

The UX facts and statistics are analyzed by Homestead (2015), shows that people remember experiences more than functional products:

- 68% of users exit the site because of bad UX design
- 44% of online customers will share their poor experience
- 62% of customers come back if UX is desirable.

Consumers are twice as likely to tell about a bad experience than a good one (Echo Research 2012). One poor experience can create a negative feeling to customers and keep them away from the product permanently. As a consequence, a bad design will ruin the product's credibility and cost customers.

3.2 Visual Design

3.2.1 Typography

Anne Carton (2020) explained typography as the art of arranging typeface in several aspects: font, size, and spacing. Briefly, typography is the style and illustration of the text. Designers use typography that matches with design to create the content with a specific purpose. In business, typography can be used as a company's signature to make an impression on audiences.

In the typography world, fonts and typefaces are the two most important elements. The two words used to be used interchangeably (Webster 2019). However, their meanings are distinct from each other. Anne (2020) pointed out that font refers to widths, heights, size, and styles of characters while the typeface is a family of the corresponding fonts. The term "fonts" has been explained as properties of the Typefaces.

3.2.2 Colors

Cameron Chapman (2020), author of “The Role of Color in UX”, mentions that the use of a wise color palette is an important role in the psychological effects of a designer on audiences. Hence, it is the UX. Choosing the right color helps place users in the state of mind that encourages them to respond (Barker 2016). While color is a matter of taste and a subjective topic, taking advantage of certain meanings can grab customer’s attention. Each color represents different emotions and styles. Depending on which color palette is generated, the product targets a specific kind of audience.

Christian Vizcarra (2019) lists three key elements in color: hue, value, and saturation. First of all, the hue is defined as an original state of color in the same light and shadow condition. To calculate the variation of brightness and darkness, the term “value” is used. When the color reaches the value at 100%, all hues develop the same white color. In contrast, when the color has the value at 0%, it results in black color. Finally, saturation is the strength and concentration of the color in the same hue. The entire hue palette will have the same gray color when designers completely desaturate it or reduce the saturation value to minus 100%. (Vizcarra 2019.)

For a better user experience, deploying a color palette is recommended. The colors are chosen from the same scheme, supporting better information achievability (Vaniukov 2020). There are various ways to group colors from the wheel to the same palette. The seven schemes in Figure 6 are the most common ways to clarify the relationship between colors.

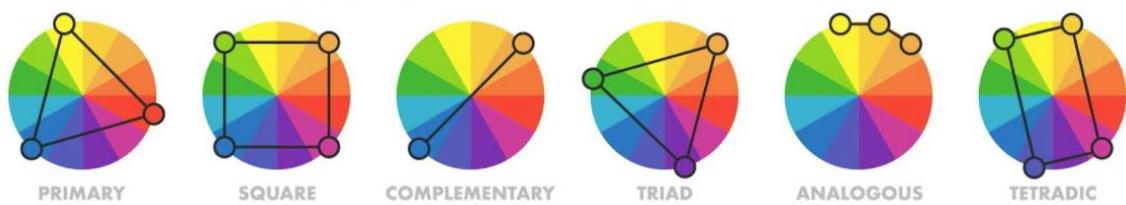


Figure 6 Color relationships (Vaniukov 2020)

3.2.3 Images

Images are compared as a visual language that designers use to send a message to audiences. The visual data is received and handled better than any other type of information from a human viewpoint. Visualization is transmitted to the brain 9 times more effective and 60,000 times faster than text. (Eisenberg 2014.)

Along with the development of technology, the mobile phone has better resolutions and internet speed increase with affordable data packages (Butler 2018). Therefore, loading the quality image is no longer a matter of time in user experience. Notwithstanding the purposes, there are significant numbers of guides along with some focus when implement images:

- Consider mobile display (Butler 2018)
- Use high-resolution images without deformation (Babich 2017)
- Choose image based on content
- Consider the overall layout
- Consistency in visual style
- Select the relevant and specific images. (Kaul 2017.)

3.2.4 Consistency

In user interface design, consistency is having the same style, content, interactions for a specific element, and using the known prototypes throughout the designs (Amin 2019). Consistency is the key rule of UX design and the most powerful principle of usability (Minhas 2018).

Under the usability concept, consistency allows users to recognize familiar features and learn faster how to use the product. Besides, it eliminates confusion about the next step. Consistent design enables designers to use predefined components and save time to discuss or debate with stakeholders. (Nikolov 2017.)

3.3 The psychology in UX design

Psychology plays a key role in UX design. By understanding different effects on audiences with different designs, designers can modify the products that deliver more value and satisfaction to users. In this research, five key design effects were applied to the re-design process: Hick's law, Von Restorff, serial position, memory limitation, and mental models.

Hick's law examines the relationship between the user's interaction time and the number of choices. Briefly, the application of this law is simplifying the decision-making step and avoiding overwhelming tasks. (Soegaard 2020.)

Von Restorff is described as the isolation effect. It anticipates user decisions by presenting one distinctive object among various similar objects. This distinction is the most likely to be chosen and remembered. (Rigopoulos 2020.)

The serial position states that the most memorable position is the first and last items in a collection. The popular application is replacing a hamburger menu with a top or bottom navigation bar on the screen display. In the navigation bar, the position left-right of essential buttons is also considered. (Rigopoulos 2020.)

According to Abu Experience from Uxpert LAB (2018), human working memory (or short term memory) holds information in approximately 10-15 seconds. Besides, retention is only 3-4 information at a time and faded after 20 seconds. Consequently, memory limitation leads to a list of requirements for mobile and web designers:

- Fast response time
- Different color for visited links
- Comparison among products
- Encoding important data and automatically sync to the appropriate places
- Implementing support features in the same environment. (Nielsen 2009.)

James Clear (2020) states that the mental model is an explanation of how products operate. The mental model can cover various aspects. In the user interface, it is defined as the belief that customers bring from the real world to the system. Users predict the system's works and interactions are based on their beliefs. Thus, it is a responsibility and target for designers to develop the UI and features understandably.

3.4 Defining other important concepts

3.4.1 Online learning platform

For this research, the explanation by Technopedia (2020) has been adopted. It states that a collection of internal pages that shared a single domain name can be considered as a website. No rules are constituting the structure of the sites (Technopedia 2020). People could create an empty page with a single word leading to another page, and it is still a website. The interminable category of websites includes news, blogs, social media, media sharing, education, and so on.

3.4.2 Iterative design process

The iterative design process is a cycle, where designers and testers create a prototype, examine it together, then analyze, improve the prototype, and check again. The process is repeated until the team is satisfied with the final results. (Smartsheet 2020.)

By focusing on how users think and interact, the procedure of idea, prototyping, testing, evaluating, and modifying has four steps:

- Understanding user needs and behaviors
- Generating and brainstorming ideas
- Creating an early example of products
- Analyzing the feedback. (Smartsheet 2020.)

4 COMMON UX STRATEGIES

4.1 User-centered Design

User-centered design (UCD) is generally understood as an iterative process of putting users at the heart of a product plan and establishment (Novoseltseva 2020). In this paper, the standard principles of UCD are used to focus on users' needs and products' requisites. Process phases are variable and can be incorporated with other methods. Four major steps of the UCD process are:

- Identify the target users from the beginning
- Clarify the products' requirements
- Generate innovative design ideas
- Establish quality evaluation. (Usability.gov 2020.)

The first step is getting to understand users with user research. The main objective of this phase is to have a visualization of the target audiences. The research is conducted here to have a clear awareness of the five Ws questions, "Who is the user?", "What are they need to know?", "Where is the user in the process?", "Why are they interested in the products?" and "How will they use it?" (Rosenberg 2019).

After knowing users and their demands, the next step is identifying the requirements of both business and users. For business, it is revenue, scope, and stakeholders. For users, the demand is problems solving or outcomes (Tran 2019).

Ideate is the stage that creates and forms the design elements and features. This phase includes the traditional UX steps: site map, user flow, sketching, low to high fidelity prototypes (Babich 2019). When the design is ready, the process will be moved to the evaluation stage.

Evaluation means analysing and assessing the designs together with business representatives. Although evaluation is the final step, UCD is an iterative process. The process will go back to step one until the products meet users' needs and purposes. (Tran 2019.)

4.2 Design Thinking

Tim Brown (2020) defined Design Thinking as an iterative method that can fulfill both customers' needs and business' requirements. Designers use Design Thinking to disrupt a problem into its smaller pieces and understand all aspects. Subsequently, the team solves issues in human-centered approaches.

When deploying design thinking, five stages in the iterative process can be illustrated in Figure 7.

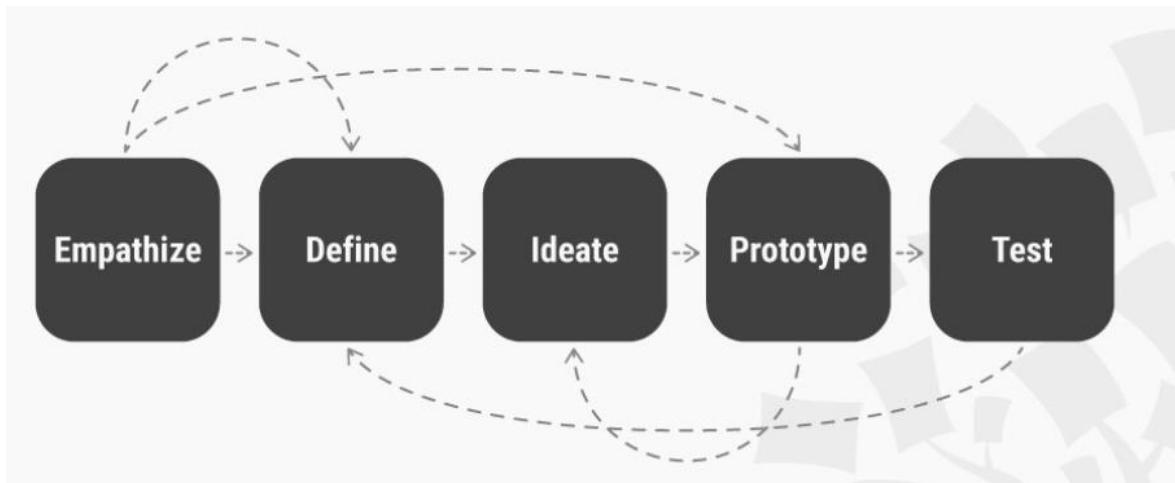


Figure 7 Design Thinking: A 5-Stage Process (Interaction Design Foundation 2020)

Empathy is the most critical to a human-centered approach, especially Design Thinking. An empathetic point of view to the root problems allows designers to set an assumption about operation and users' demands. (Dam et al. 2020a.)

The defining step helps to collect data from the empathize stage. In this stage, the information is examined and analyzed to recognize the core issues. From three to four personas are created in this stage. Personas represent a significant number of intended customers along with users' needs, demographics, motivations, and behaviors. (Stevens 2019.)

The groundwork from previous stages creates a solid foundation to create new ideas. Brainstorming is valuable here to sprout different aspects of the main ideas. By collaboration in a group, this method focuses on identifying as many solutions as possible. The collective ideas are compared and narrowed down to the best one. (Dam et al. 2019.)

A prototype is a trial stage to gain insight into the design process. The prototype enables designers to create an initial and simple version of the found explanations. In the form of the product's scaled-down version, the prototype allows the team to perform their solutions. (Dam et al. 2020b.)

The last stage is testing. The practicability of the ideas from the previous stage is examined here. Although the five stages are linked sequentially, it is not compulsory to be followed in sequence. The design process might jump back and forth between the phases. Besides that, some of these stages might iterate multiple times until the satisfying products are done. (Ideou 2020.)

5 UX DESIGN PROCEDURES

5.1 Research

5.1.1 User survey

A survey is a quantitative method that proves the authentication of data by considerable amounts of people (Mishra 2018). The survey is implemented as a set of questions that allows answers anonymously. While an interview requires a lot of time investment on users, UX surveys are suggested as a fast and easy way to gather data from users. It can be managed in many ways including online, face-to-face, or mail. (Rosenzweig 2015.)

Quality survey answers represent clear questionnaires and a well-designed structure. According to Chris Gray's research, various survey guidelines have been proposed to have more valuable results. The instruction focuses on both questionnaires and question format:

- Short and understandable questions
- Eliminate double negatives questions
- Consider using balanced rating scales for large amounts of options
- Avoid overlaid answers
- Include a neutral answer or “Don’t know” option. (Gray 2013.)

5.1.2 User interview

A user interview stands for a one-on-one Q&A section between researchers and the end-user. This stage aims to collect primary data from users about their needs and concerns. With the face-to-face method, the interview delivers insight into their experience with the products and gives reliable feedback for future refinements. During the interview section, audio or video should be recorded to avoid data distortion.

Because UX design is an iterative process, the interview can be conducted in many situations:

- At the first step of design works
- Supplying documentation in the middle of the design procedure
- The final responses to the usability test. (Pernice 2018.)

5.2 Research results

5.2.1 User survey results

In the first two weeks of June, a survey was released and sent to the university student community in Finland. The audiences of the questionnaire include international and Finnish students. 235 results were gathered from 164 LAB students and 71 learners from other universities. Figure 8 shows the distribution of the surveyed people.

Which University are you currently studying?

235 responses

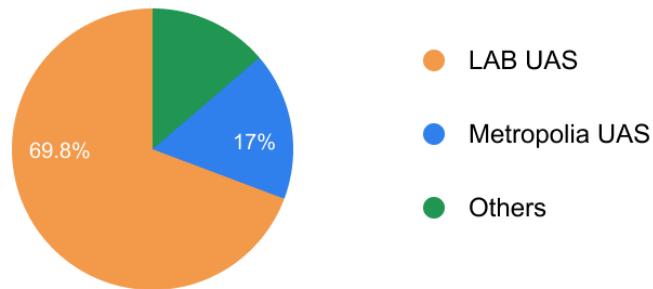


Figure 8 Pie-chart representing the University of the users

The chart illustrates that not all participants are from LAB University. Therefore, survey questions are divided into two parts according to which University they are attending. The relevant data in Figure 9 shows the typical spending time of users on the Reppu and Moodle online learning platforms.

How much time do you typically spend on Reppu/Moodle website per day?

235 responses

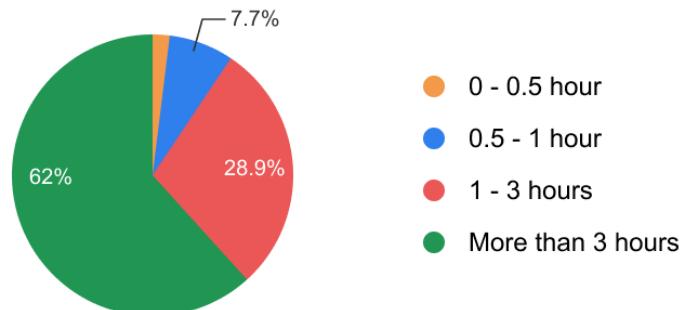


Figure 9 Pie-chart representing the data of spending time on learning platform per day

Overall, three-fifths of students invest more than 3 hours per day for online study at their university's learning platform. From 1 to 3 hours of accessing Reppu or Moodle, the rate follows at 28.9%. The other categories are much lesser, 20 out of 235 people spend fewer than 1 hour per day.

The bar chart in Figure 10 shows the rate of important features in the online learning platform from 235 audiences. Approximately 90.2 % of surveyed people consider that simple and easy to use interface are necessary. It is clear from the chart that a good interface plays a key role in the student experience.

What features you think are important on those learning websites?

235 responses

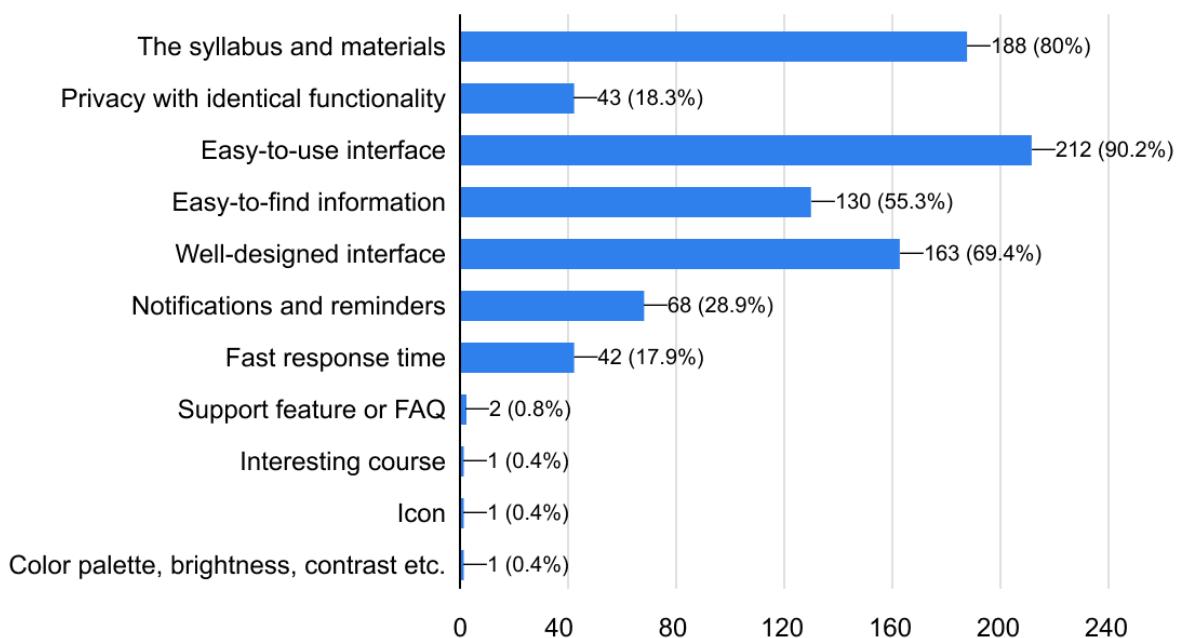


Figure 10 The important features from the users' perspective

The question in Figure 11 examines students' difficulties in online learning platforms.

On scale of 5, how easy is it to find what you are looking for?

235 responses

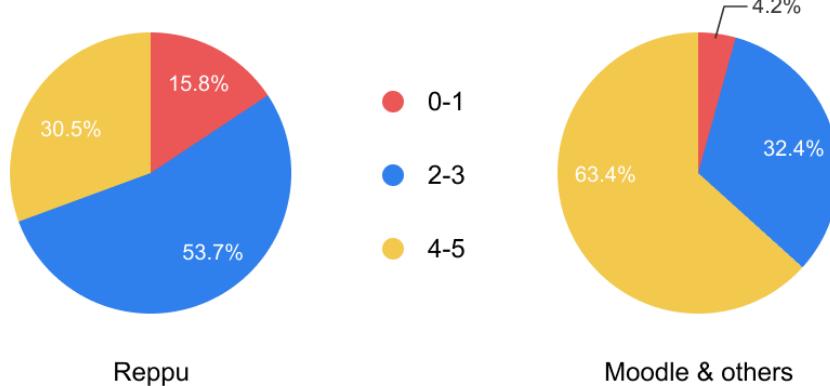


Figure 11 Pie-chart representing the usability of web-based education platforms

With two groups of participants, the questions investigate the usability of Reppu compared to Moodle and other online learning platforms. The lack of usability is detected in the LAB platform. The percentages of students are struggling with LAB's platform is approximates 15.8%, nearly four times higher than other universities. While more than half of surveyed participants feel neutral about the platforms, the significant numbers of students who are comfortable with Reppu, are low (30.5%).

The following three questions were focused on 164 students of LAB. Figure 12 shows the strengths of the current platforms at LAB. The statistic illustrates that only the utility of the online learning platform is fulfilled. The majority of the answer mentioned that the usefulness of Reppu is the only remarkable factor.

What features do you like the most about Reppu?

164 responses

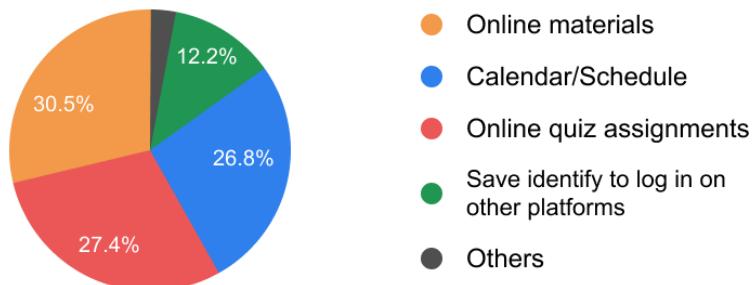


Figure 12 The most noticeable features about Reppu from the learners' perspective

According to the survey result, the most struggling issue of Reppu is usability (Figure 13), which is complicated and takes time to be used to with. In terms of visual design and information architecture design, the levels of dissatisfaction are corresponding to the value of 89% and 68.9%.

What frustrate you when using Reppu for online study and seeking information?

164 responses

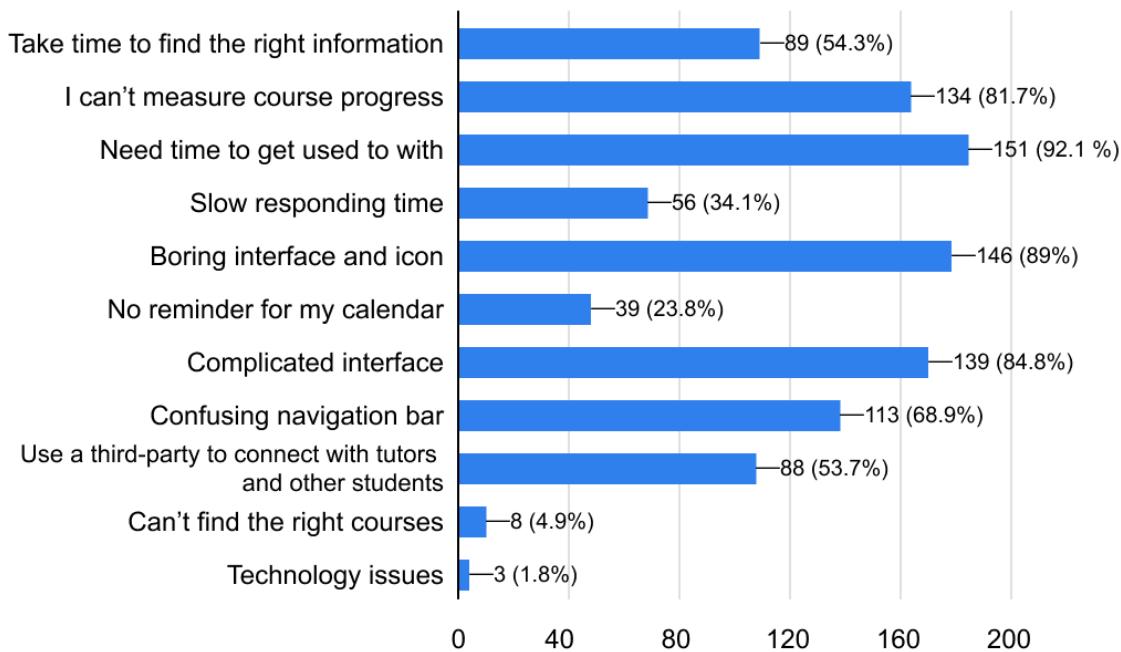


Figure 13 Frustrations when using Reppu from the students' perspective

The last question is an open-ended question that allows users to give their suggestions for improving the online learning platform. An open-ended can't be answered with "yes" or "no". It helps the researcher see things from different points of view when getting the ideas in participants' words. 89 users answered this question. To ensure the quality of the survey results, only the most frequent answers were chosen:

- Attractive design
- Clear navigation
- Adding study progress bars/process bars
- Easy access to information
- Improving responsive speed
- Simple interface
- Implementing communication tools.

5.2.2 User interview results

On the second half of June, eight interview sections were implemented on LAB students with face to face discussion. Based on the research results and target audiences, three personas were created. Three fictional characters represent the different types of students who are using Reppu. Generating personas helps designers to visualize users' needs, motivations, and targets.

Tomi Dual is a new Master student at LAB University of Applied Sciences. He finds the courses at LAB very useful for his future career. However, the online learning platform is quite complicated and difficult to work smoothly. Tomi's persona can be shown in Figure 14.

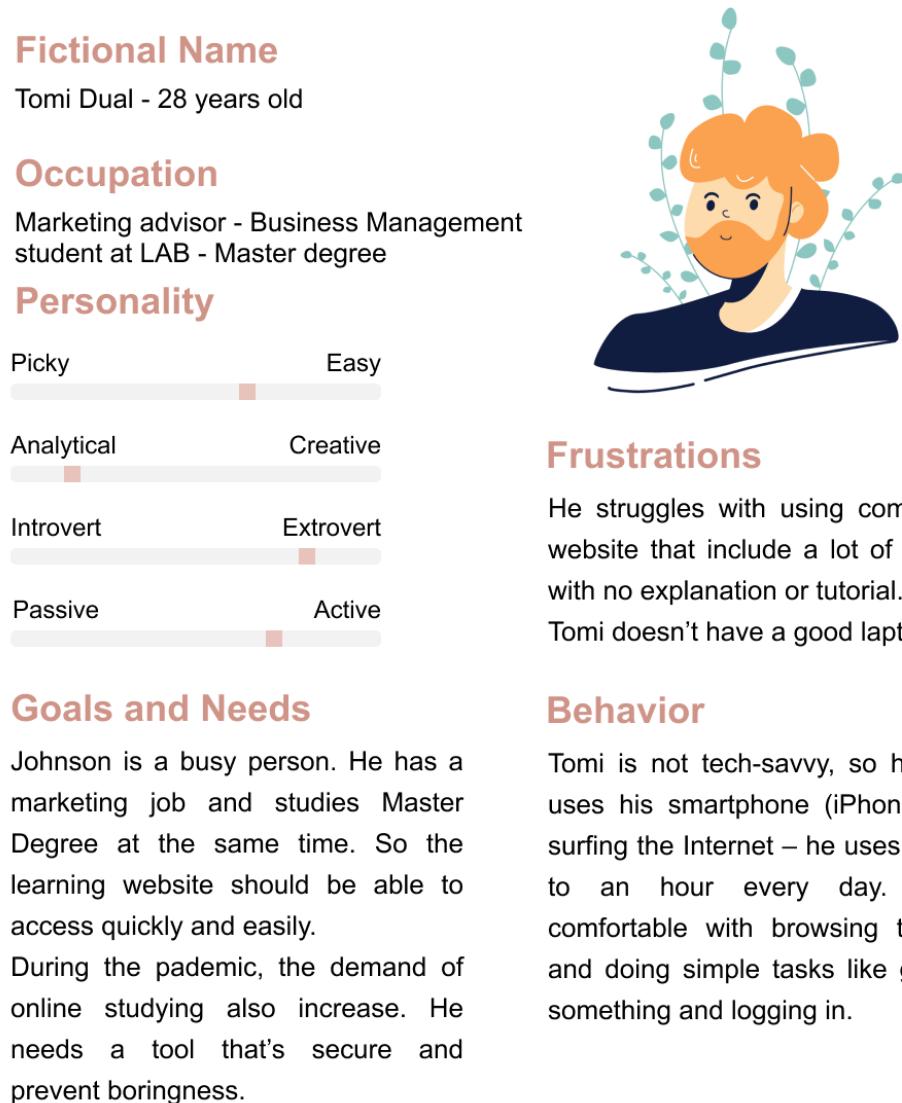


Figure 14 Persona of Tomi Dual

Jennifer is a second-year Bachelor student at LAB. She's studying Technology and familiar with Reppu. However, it takes a lot of time if she wants to find something new on Reppu. Besides, she's struggling with managing learning materials since she has to download all the files. Sometimes, she forgets where she left the file. As a consequence, she has to re-download it. Jennifer's persona illustrates in Figure 15.

Fictional Name

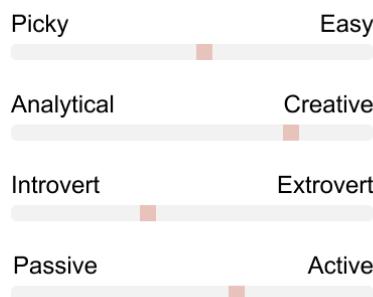
Jennifer Smith - 19 years old



Occupation

Business Information Technology student at LAB

Personality



Goals and Needs

Jennifer is a BIT student and she takes part in several online courses at LAB. Day by day, she's used to with Reppu but still not satisfy with the visual looks. J and her friends are suggesting for a new design.

Frustrations

Getting used to with current online learning platform since it's only choice.
Taking time to find the needed information.

Behavior

Jennifer spends the most part of her day (5+ hours a day) on the smartphone. She is tech-savvy and uses the latest iPhone. Her phone is full apps, she prefers them to mobile versions of websites.

Figure 15 Persona of Jennifer Smith

The last persona is Tammi Ruoka – an International business student at LAB University. She has had experience with various online learning platforms. One of them is Reppu. She recognizes Reppu's problems immediately. Therefore, she gave the feedbacks according to her own experience and the comparison with other similar platforms. The details of Tammi's information can be demonstrated in Figure 16.

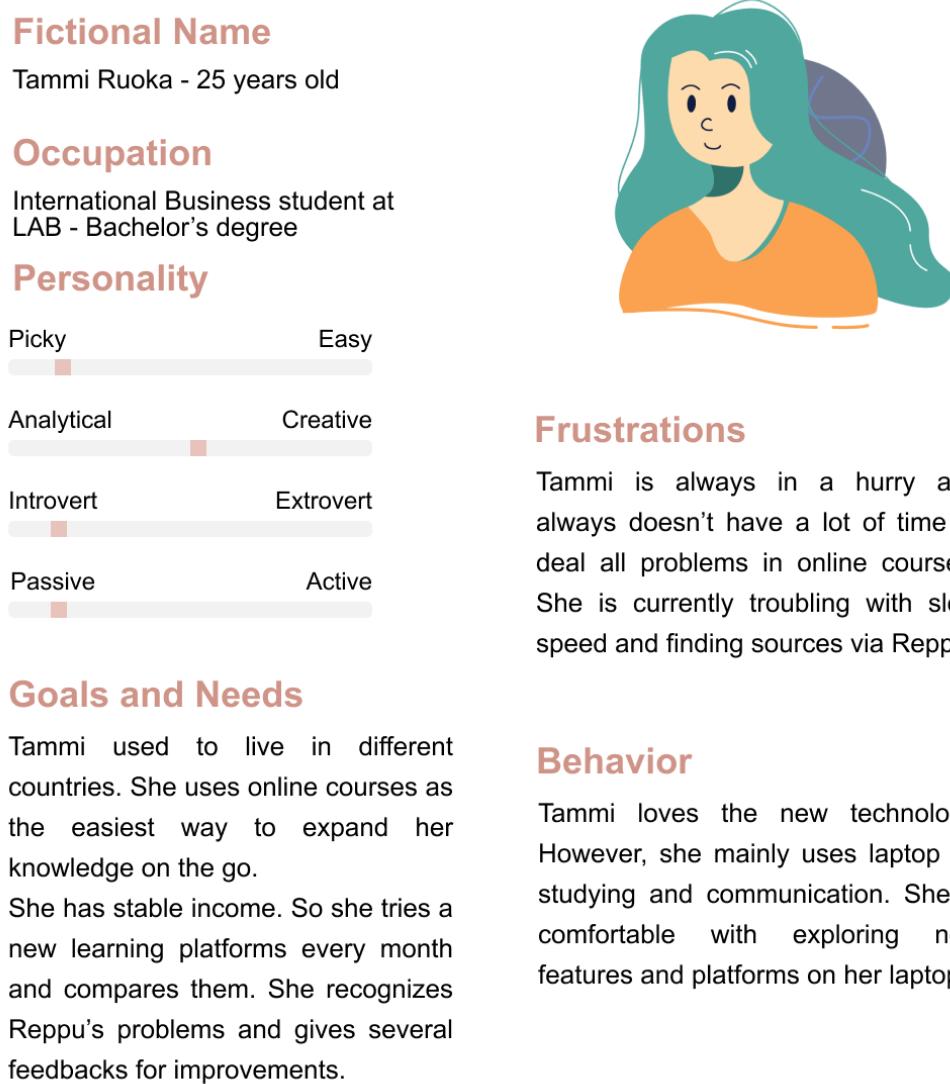


Figure 16 Persona of Tammi Ruoka

5.3 Heuristic evaluation

Heuristic evaluation is an examined method created by Jacob Nielsen in 1994. In this process, the current interface is evaluated and compared against accepted usability standards. The outcome of this process is a list of potential usability problems. (Nielsen 1994a.)

There are 10 heuristic principles to examine usability:

- Keep users notify about the visibility of system status
- Design systems based on a mental model
- Offer the management tools
- Keep consistency in design

- Prevent errors
- Have visible information that helps users recognize features
- Be flexible and minimal designs
- Contain only relevant details
- Support errors with the simple help
- List the frequent error with needed documentation. (Nielsen 1994b.)

Based on previous personas with different personalities, frustrations, behaviors, and needs, the study pointed out the possible issues that they might suffer. The heuristic evaluation in Table 1 explained the limitation of the Reppu from those personas' perspective. The elements are examined in terms of usability and visual design. The severity rating is evaluated on a scale of 4:

- 0: not a problem
- 1: cosmetic issue only
- 2: Minor usability or design issue
- 3: important to modify
- 4: fix compulsorily. (Nielsen 1994c.)

Table 1 Heuristic evaluation results

Heuristic principles	Severity	Detail
Let users know what is going on	3	<p>There's no visible change in visited/clicked elements.</p> <p>Login error shows the same general message for all wrong input.</p> <p>In the login section, the page doesn't check the saved username and email in the database before return the message to the user.</p>
Match between system and the real world	1	<p>The list of course categories should look like a clickable link or folder.</p> <p>The personal profile should use the words "setting" or "customize" instead of "preference". This word might confuse users.</p>
User control and freedom	2	There's no undo button when deleting an uploaded assignment accidentally.

		<p>There's no turn-off or "mark as read" options for the notifications.</p>
Consistency and standards	2	<p>The button and navigation bar look the same across the site on all pages.</p> <p>Setting buttons' position is different and hard to see.</p> <p>The page's layout is simple. However, it is not well-organized. Besides that, there are too many external links that need to be opened in the new web tab.</p> <p>The language is inconsistent throughout the entire page.</p>
Error prevention	3	<p>When searching for the courses, students expect that they don't have to type the full course's name.</p> <p>There's no correct spelling and suggested result for not found keyword.</p> <p>On the login page, there's no detection in the username input before users insert their passwords.</p>
Recognition rather than recall	3	<p>No assignment history record lets users start their assignment from the point where they left it.</p> <p>No reminder suggests students complete a certain work that is due soon.</p> <p>In each course, the design should minimize the user's cognitive load by sorting the links by functions or purposes.</p>
Flexibility and efficiency of use	1	<p>The design is straightforward. It doesn't have any shortcut or recent access pages. This is a potential problem for students if they're in hurry and can't make a fast submission.</p>
Aesthetic and minimalist design	2	<p>The information presents redundantly in the form of a list. Too many displayed lists will distract users from the prioritized elements. As the consequence,</p>

		<p>users will forget the action that needs to be done there.</p> <p>The displayed lists are relevant but not every revealed information is necessary and useful.</p> <p>There's a big folder under the name "quick link for staff". The folder has never been used by students. However, it's still there. This might waste time on users.</p>
Help recognize, diagnose, and recover from errors	2	<p>In the login section, when users enter a wrong username or password, the system doesn't inform the user whether the username is nonexistent or the password is wrong.</p> <p>Users assume that when they click the "reset passwords" and type the email address, the system will let them know whether they input the right email or not.</p>
Help and documentation	1	<p>The Edit profile has a red exclamation point with no guidance.</p> <p>The Reppu page doesn't have a chatbot or online support function.</p> <p>Instead of FAQ, it has instruction in the form of videos that contains how to use Reppu from a to z. The instructed video can't replace the possible errors and their solutions.</p>

6 IMPLEMENTING UX DESIGN

6.1 Ideate

6.1.1 Information architecture

Based on gathered data from the user research and four IA components, the list of requirements is proposed:

- The “link for students” and “quick link for staff” on the navigation bar only appear according to their roles at the university.
- The number of lists has to be lessened by sorting some categories into another folder.
- The repeated labels in the navigation bar have to be eliminated.
- To keep consistency across the screen, some labels are re-named.

The modified information architecture is represented in Figure 17.

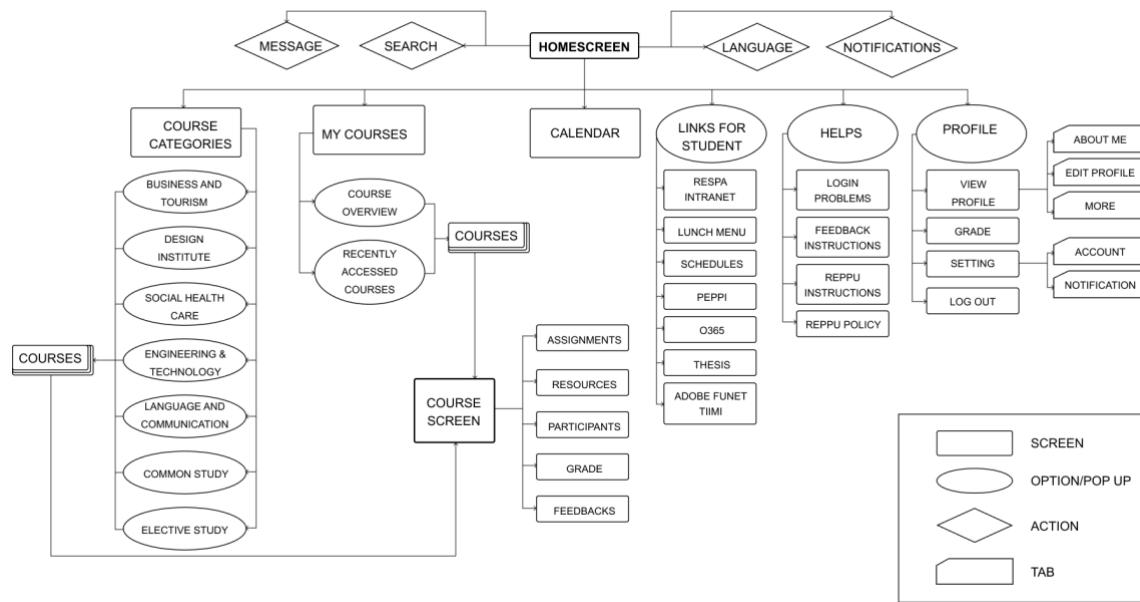


Figure 17 Reppu redesigned Information Architecture

6.1.2 Wireframing

In this stage, the important factors are analyzing plenty of suggestions from the heuristic test and choosing the possible features to implement. After generating ideas for paper sketches, higher fidelity was made as design outlines. The feasible improvements are provided as the following:

- Adding course progress

- Displaying the courses on the home page
- Implementing search feature in all pages
- Hiding the navigation bar in the hamburger menu to optimize space
- Adding calendar feature
- Hover effects
- Re-arranging the list of navigation label
- Consistent language across pages
- Adding the “mark as read” features for notifications and messages
- Differentiating error message for specific bugs
- Implementing suggestion for search bar
- Display the “Quick links” menu based on the type of account (student/teacher).

In this study, the main wireframes are presented from Figure 18 to Figure 23: redesigned homepage, redesigned homepage’s menu, redesigned calendar page, redesigned course categories page, redesigned course page, and redesigned course page’s menu.

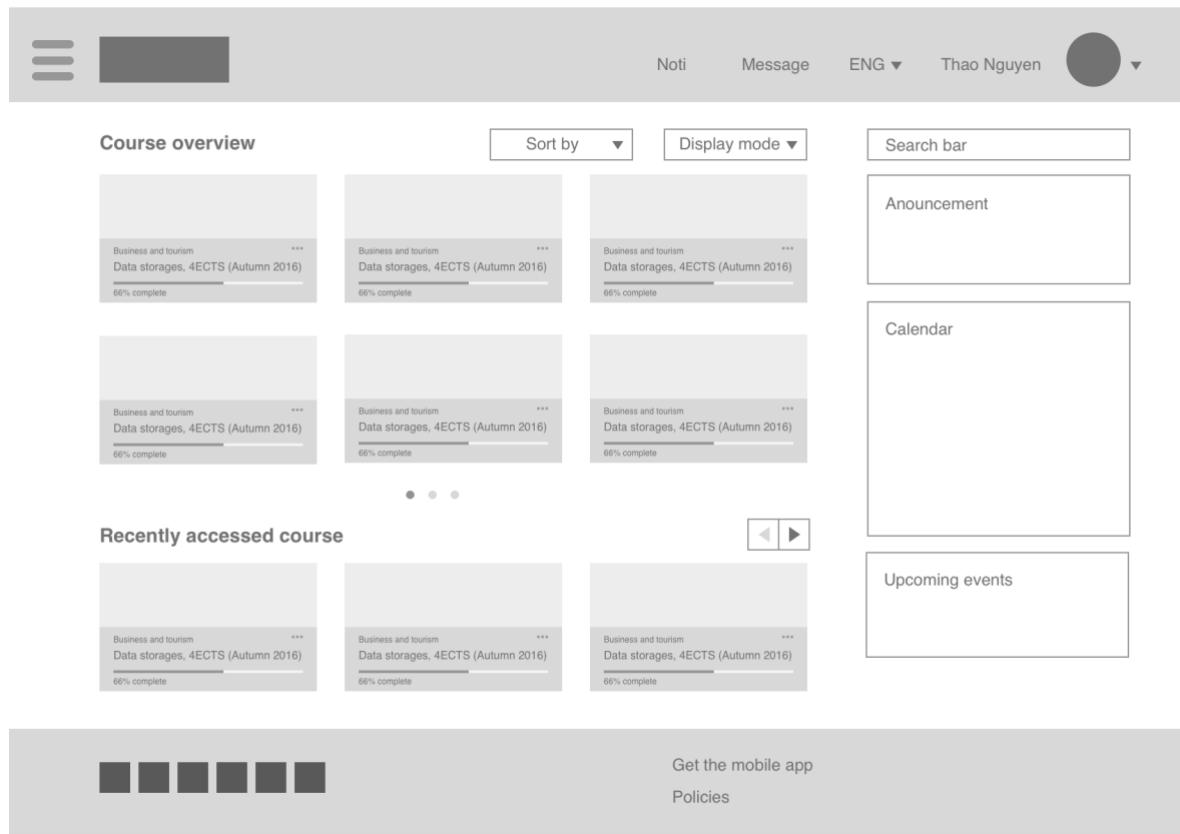


Figure 18 Wireframe of the redesigned homepage

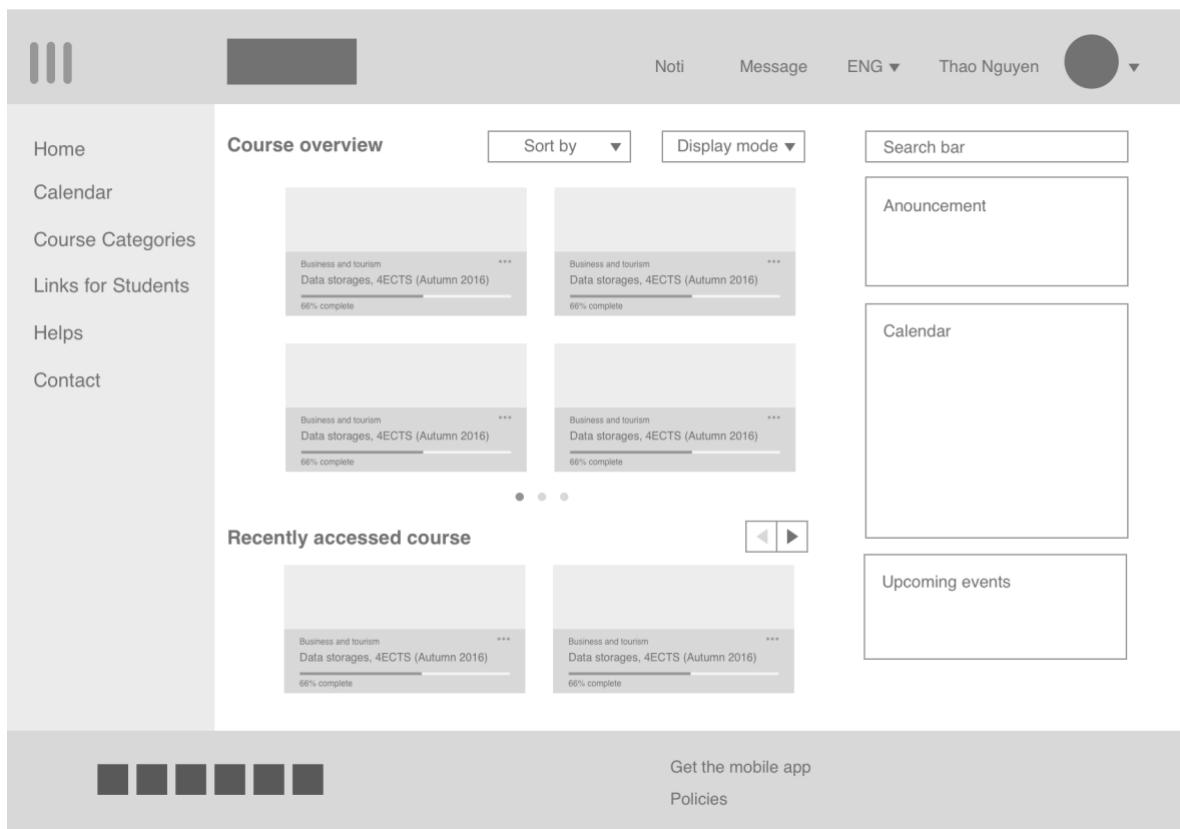


Figure 19 Wireframe of the redesigned homepage's menu

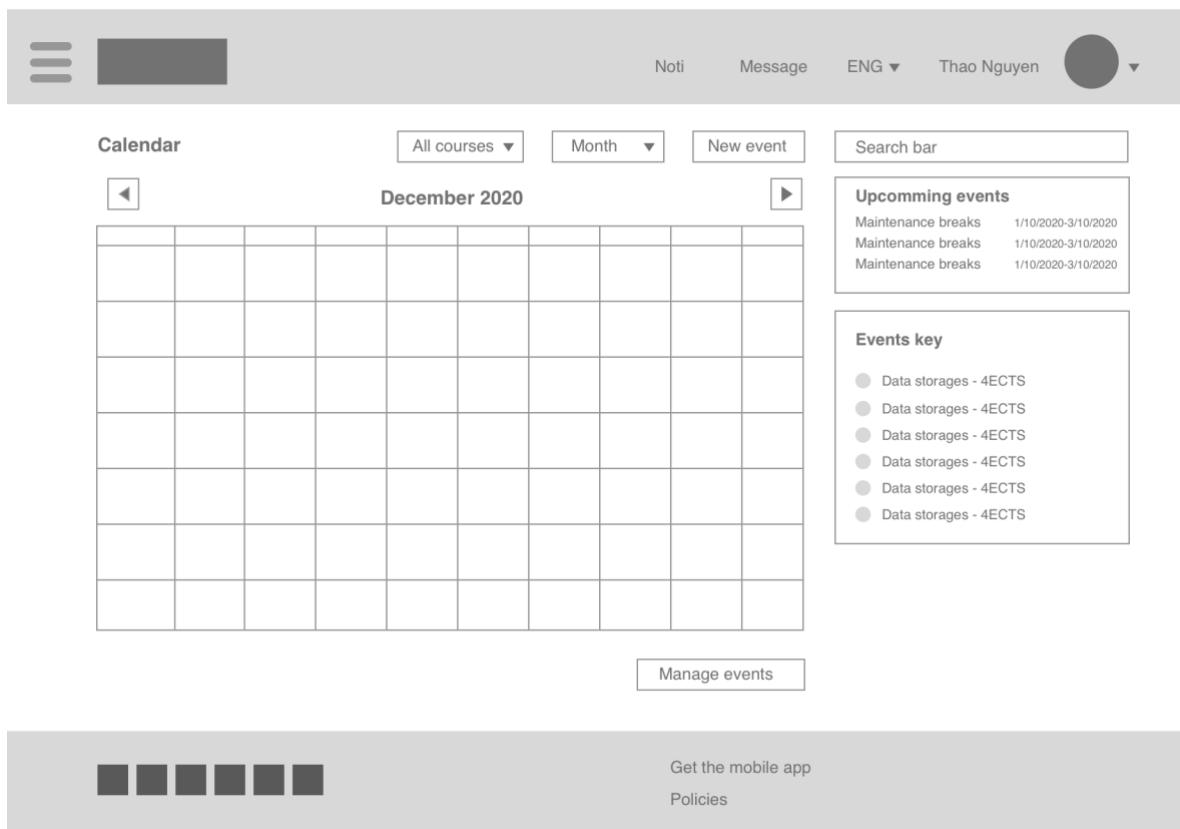


Figure 20 Wireframe of the redesigned calendar page

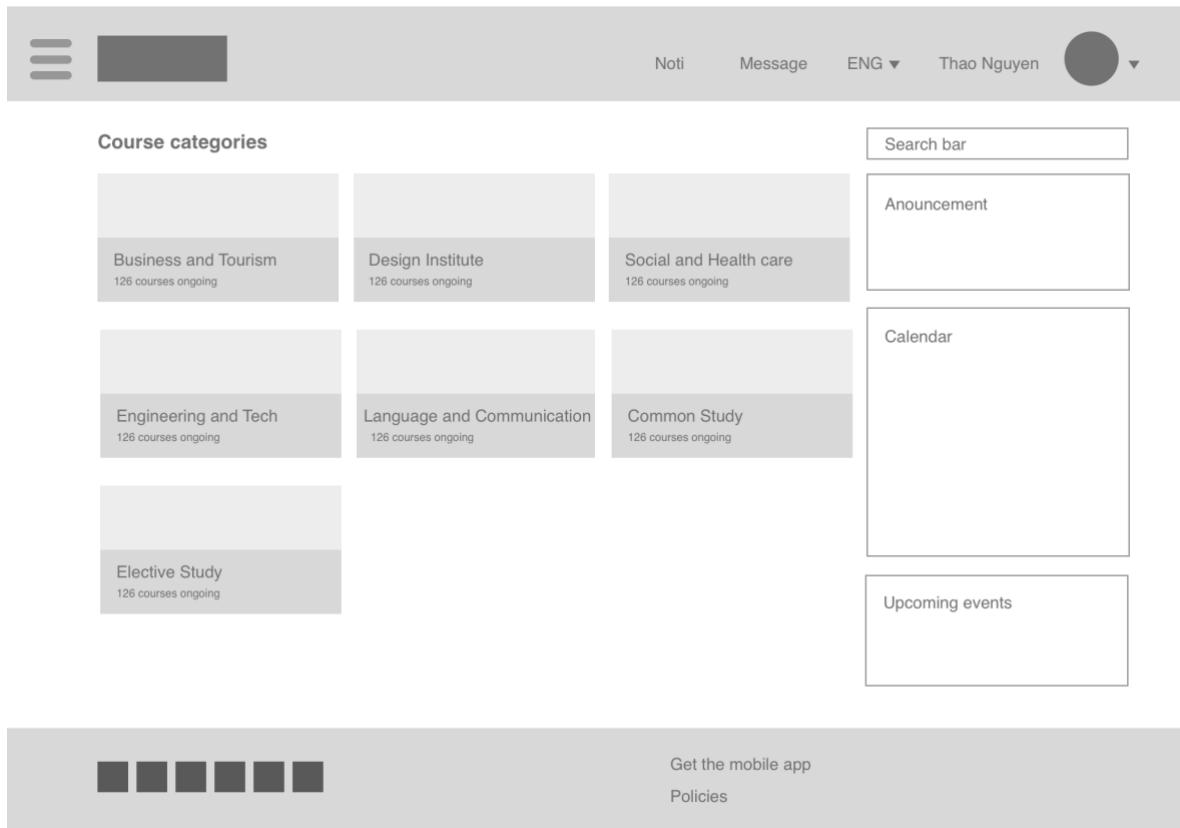


Figure 21 Wireframe of the redesigned course categories page

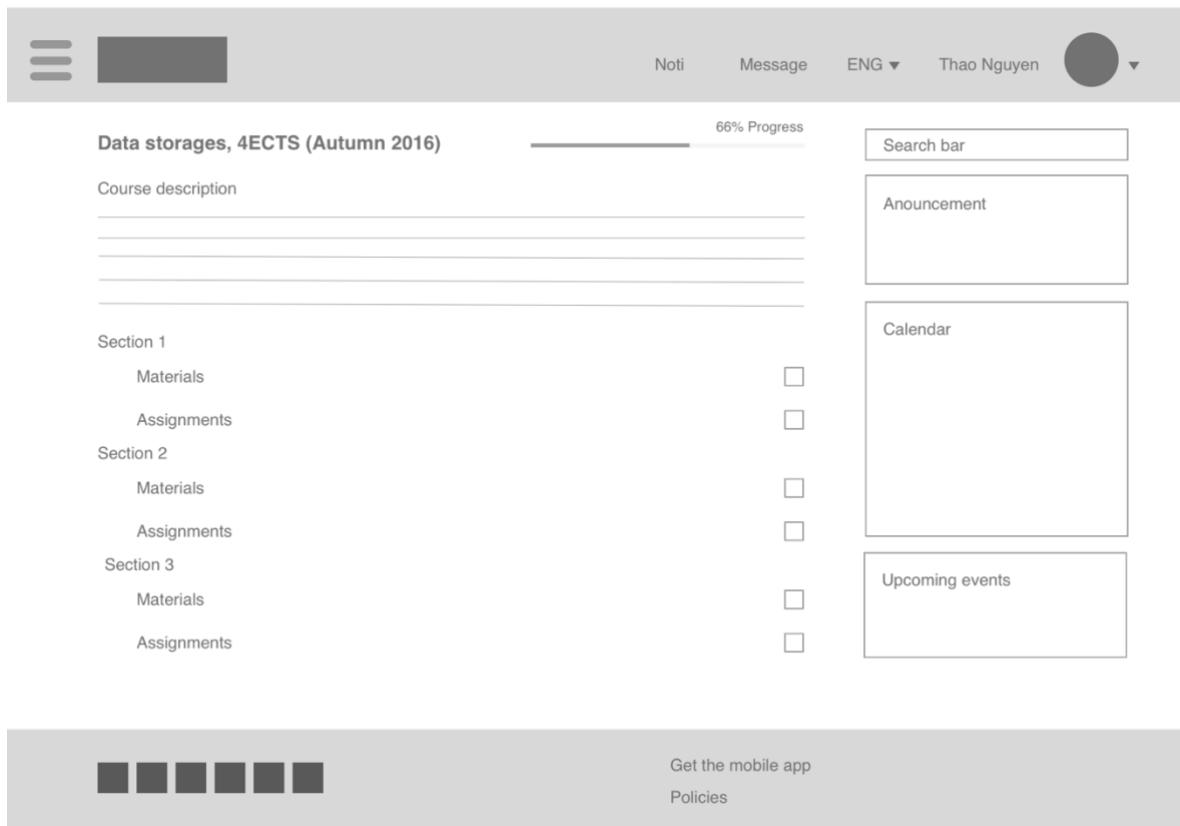


Figure 22 Wireframe of the redesigned course page

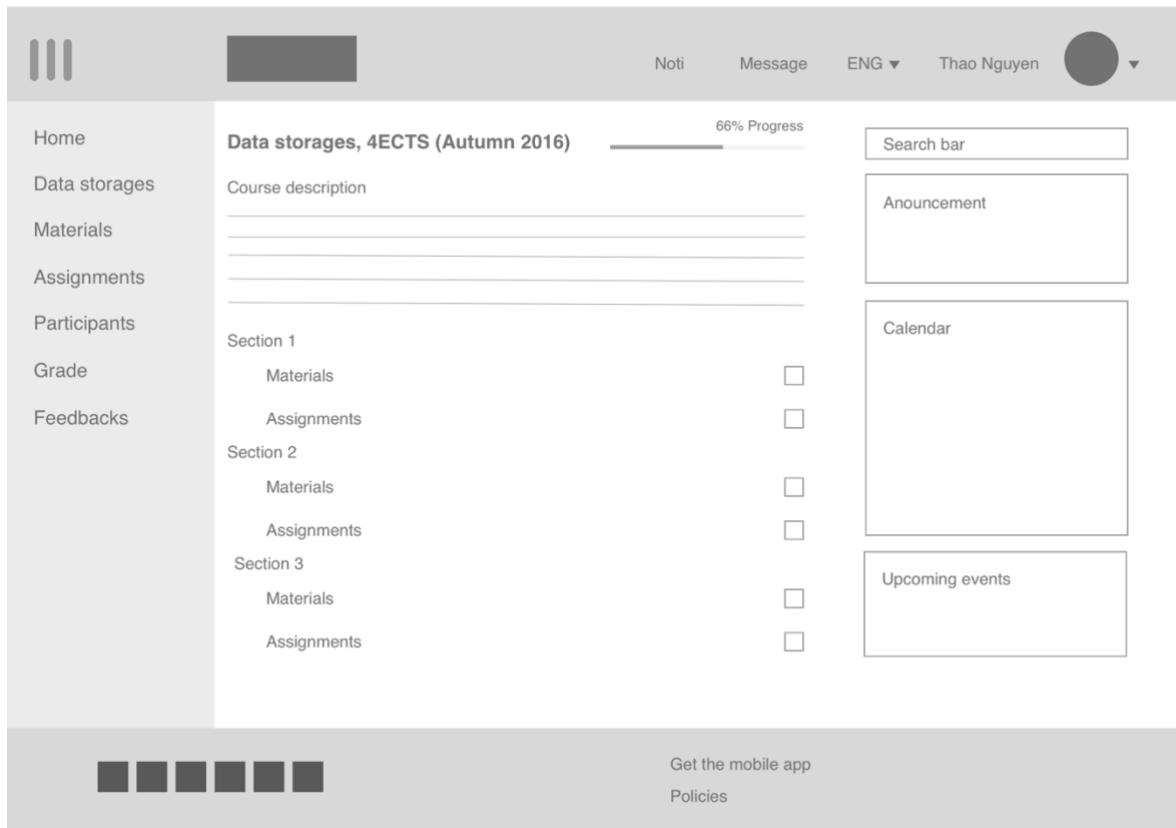


Figure 23 Wireframe of the redesigned course page's menu

6.1.3 Visual design

In the current design, Reppu is using the “Montserrat” font. In the proposed designs, there are five selective font sizes and two text styles. The body text’s font size is from 15px to 25px with Medium style. Headings address the signposts that the reader can summarize the overall structure of the page easily. Three styles of heading are in Bold. From the biggest to the smallest size, they are respectively 180%, 130%, and 115% bigger than the predefined body text. For example, if the body text is set up at 15px, the three headings are 27px, 19.5px, and 17px accordingly. Finally, the font size of 13px is applied for descriptions, which is the smallest acceptable size for text. (Tiao 2017.) Typography rules are applied in Figure 24.

Heading 1	27px	bold
Heading 2	19.5 px	bold
Heading 3	17 px	bold
This is body text	15 px	Medium
This is description	13 px	Medium

Figure 24 Redesigned font size for Reppu pages

There're five types of colors in the UI color system: primary, accent, semantic, neutral, chart, and data visual. Adapted from Anna Molly (2016), the redesigned color palette is described in Figure 25.

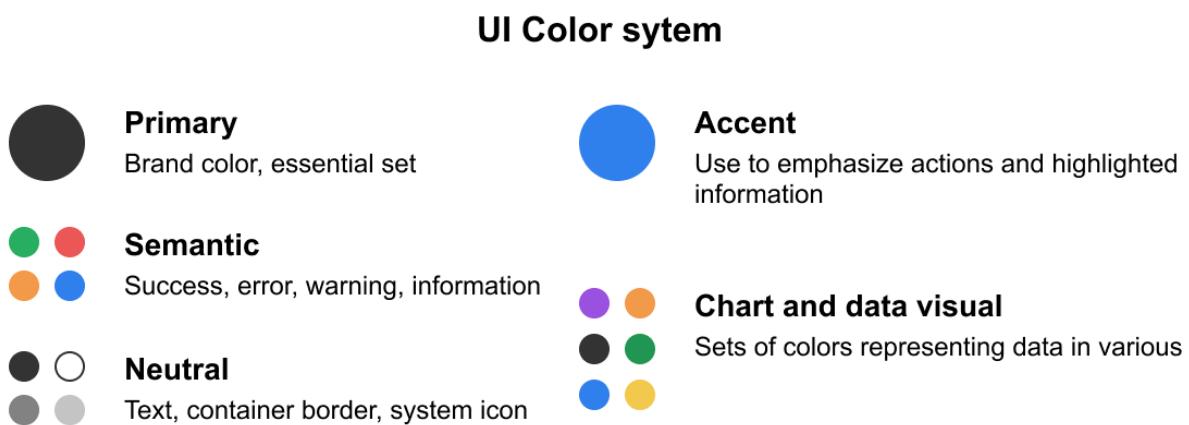


Figure 25 Redesigned color palette for Reppu

The visualization of the human brain remembers visual data better than other types of information (Eisenberg 2014). Therefore, this study used a significant number of icons to enhance data processing. A list of the recognizable icon supports users with navigation and tasks. Meaningful icons help audiences understand the message easily if they speak other languages. The consistent style of icons and their label are described in Figure 26.

					
Home	Setting	Announcement	Tips/Helps	Documents	Privacy
					
Calendar	Message	Progress	View	Information	Link
					
Security/lock	Download	Send	Trash bin	Upload	Search
					
Analytic	Cloud	Share	Notification	Filter	
					
Facebook	Instagram	Twitter	LinkedIn	Youtube	Website
					
Left arrow	Right arrow	Up arrow	Down arrow	Contact	Profile

Figure 26 List of logos for redesigned Reppu

6.2 High fidelity design

The Reppu home page (Figure 27) was redesigned with the display of a list of courses, includes the recently accessed courses and all courses. The study applied design thinking and assumed that “view my courses” is the most frequent visiting link. Therefore, users can access that page as the home page. The search feature is implemented in all pages to enhance accessibility. Calendar with a reminder will remind students if there’s any upcoming event.

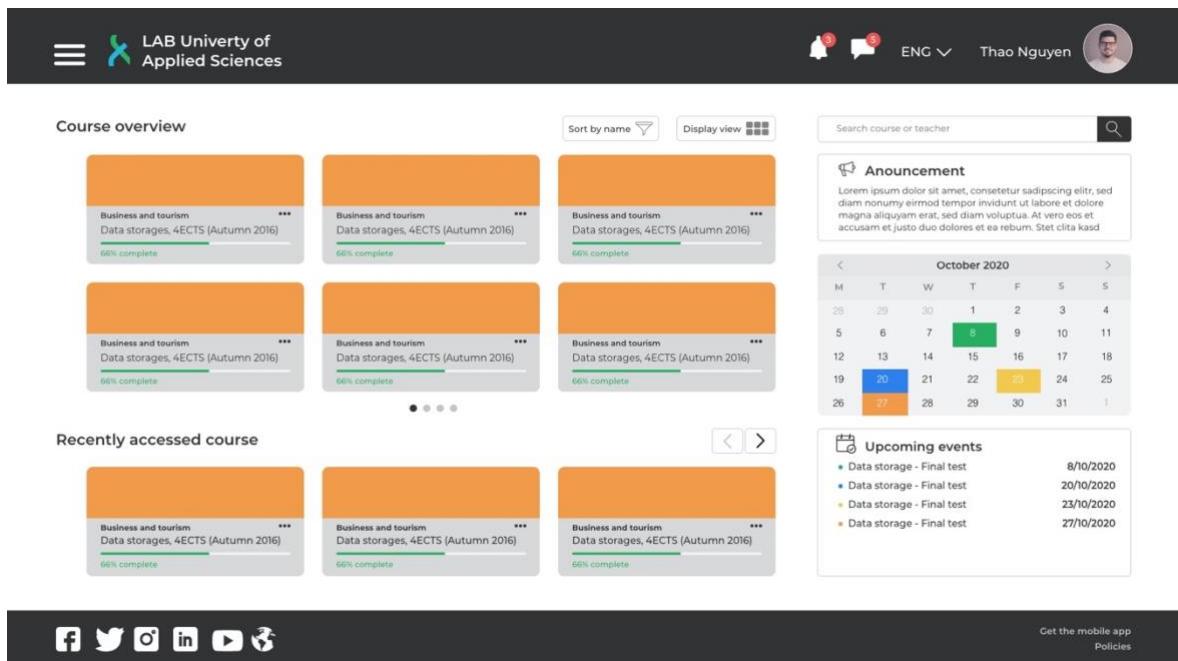


Figure 27 Redesigned home page

The main menu in Figure 28 is hidden inside a hamburger icon at the top left corner. It turns when the menu slides in and lets the user know the menu's status. The grey label background points out the position of the current view. When the main menu slides in from the left to the right, the courses are resized to fit the screen.

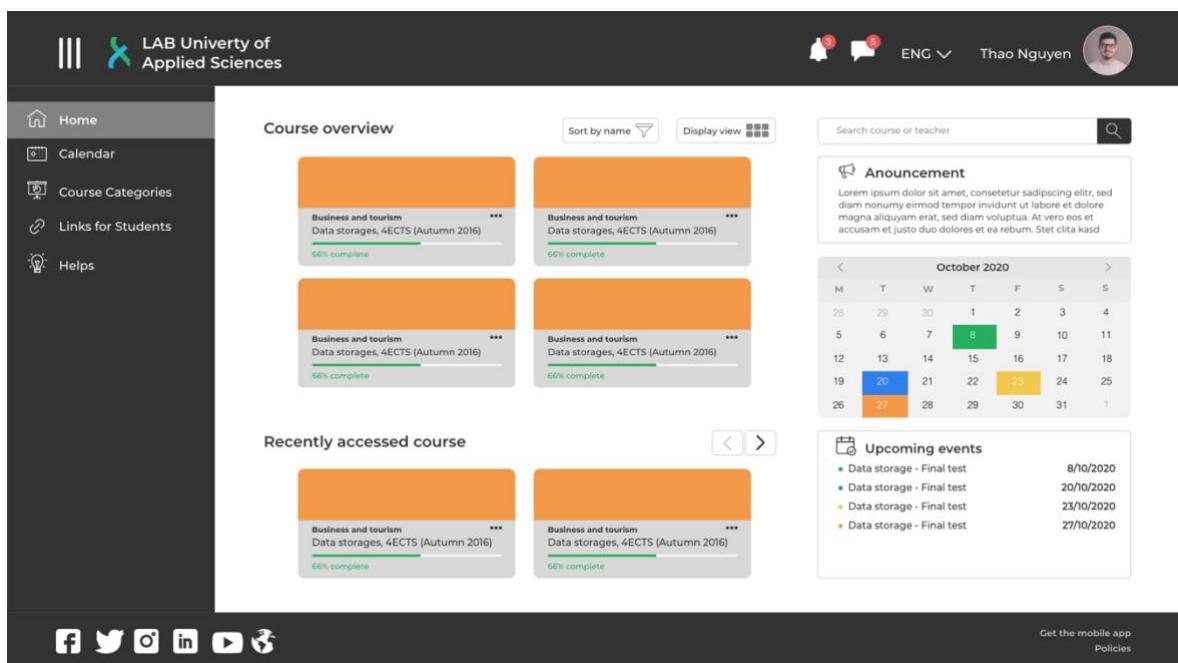


Figure 28 Redesigned main menu

The calendar is a separate section that includes all course management tools. This feature enables students to add their events or view their current events with different display views. Redesigned calendar and is illustrated in Figure 29.

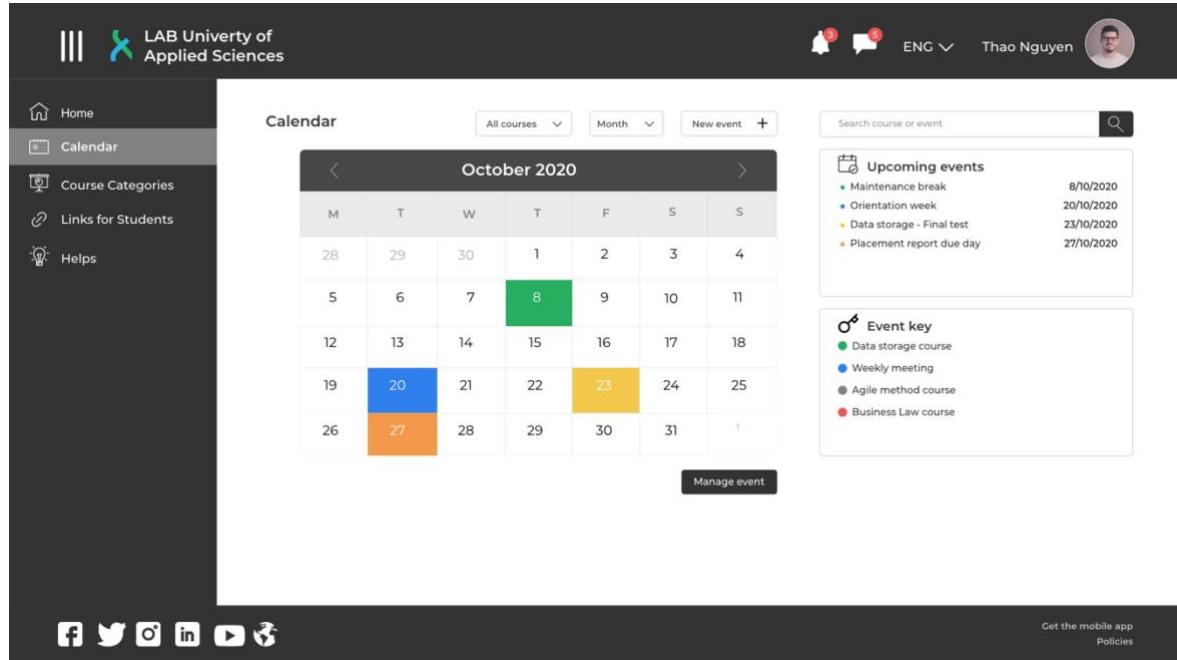


Figure 29 Redesigned calendar page with the main menu

According to the survey, users are struggling with the long list of course categories. The interviewees mentioned that the page contained information that unfolded unnecessarily. For example, students from the design institute rarely look for business courses. However, the unwrap list of other majors is distracted them from the needed one. The course categories page was redesigned as a folder for easier access. The seven sections of course categories are shown in Figure 30.

Figure 30 Redesigned course categories page with the main menu

According to the research data, the current course page encompasses excessive information. By organizing those contents to the sub-sections, the author proposes the new look of the course page and its menu, which is shown in Figure 31.

Figure 31 Redesigned course's main page and course's menu

The list of detail enhancements according to heuristic evaluation:

- The change in clicked/visited links
- The icon for the “Mark as read” feature

- Suggestion for search course
- Message for specific error in login.

The redesigned of listed features are implemented from Figure 32 to Figure 35.

Section 1



Materials 1



Assignments 1



Section 2



Materials 2



Figure 32 Visited link design

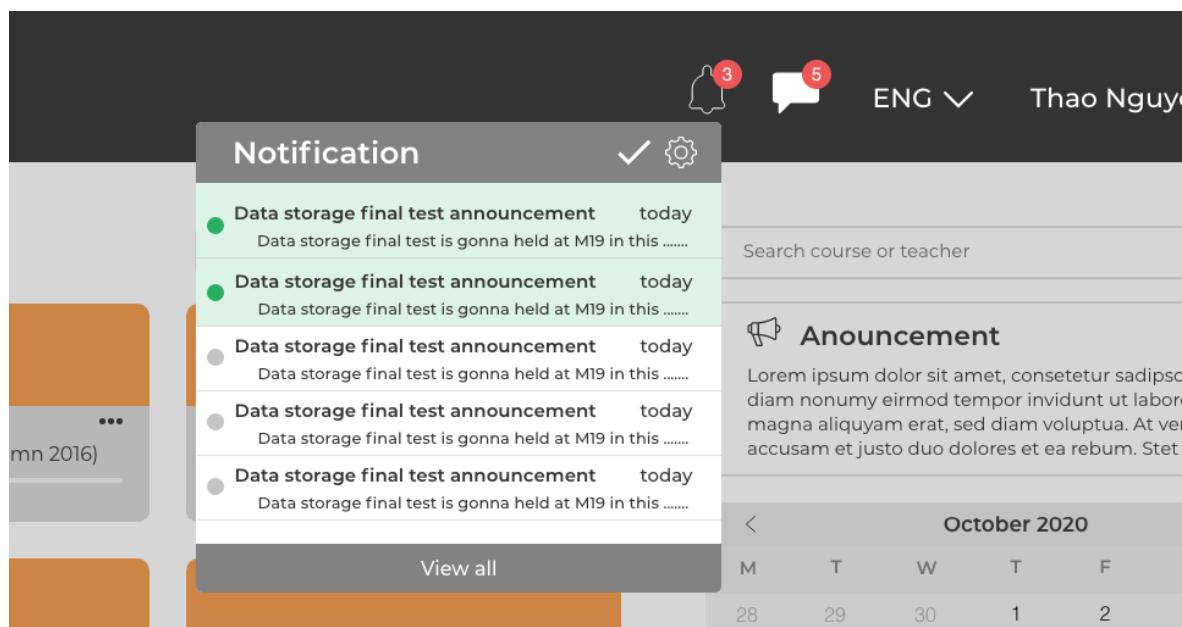


Figure 33 The redesigned notification popup

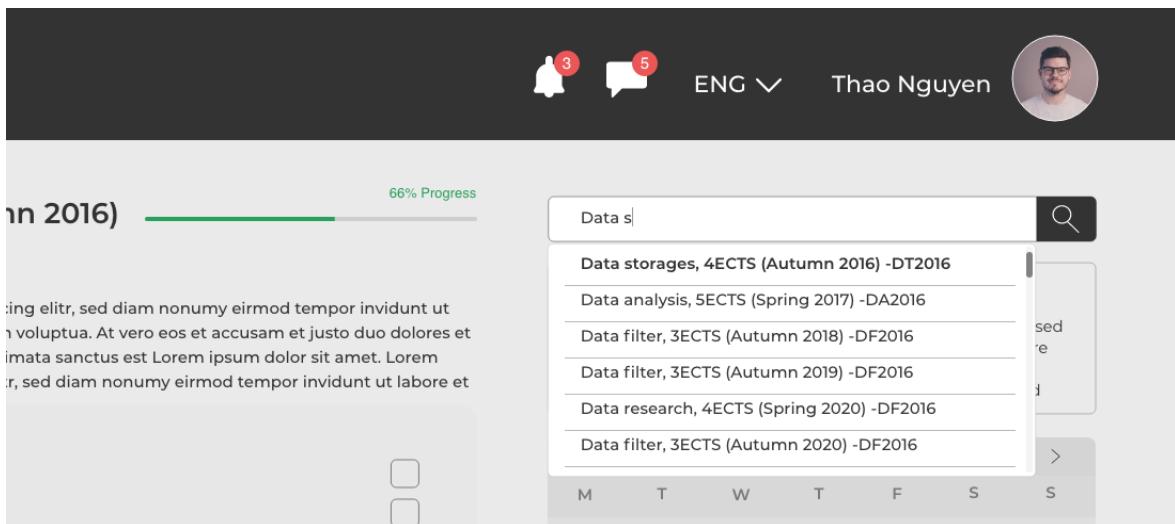


Figure 34 Search suggestions

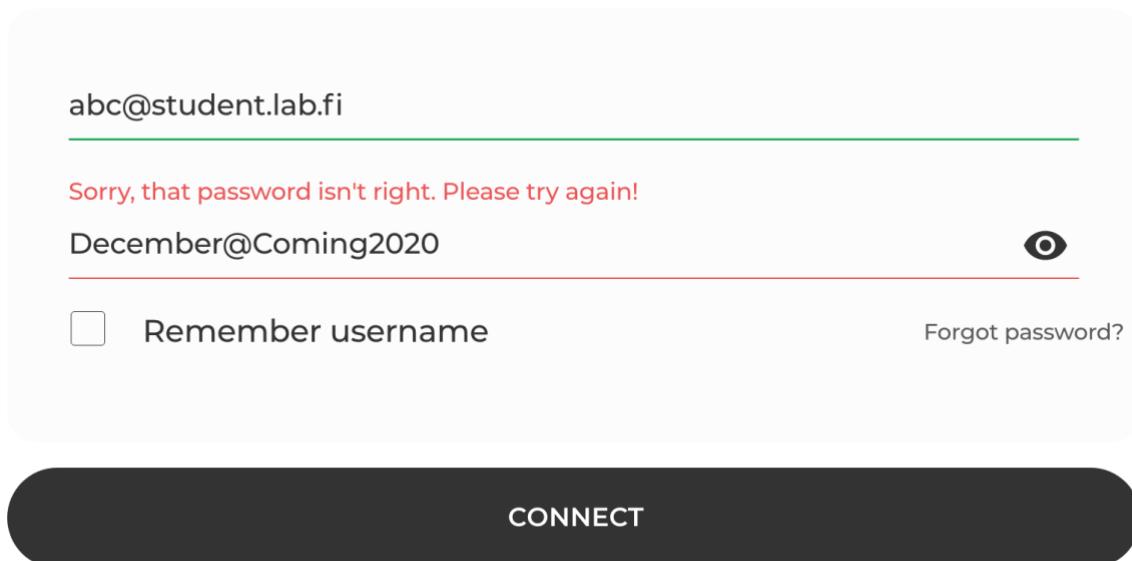


Figure 35 Login error example

6.3 Usability testing

User testing is the final step of the Design Thinking process. There are many types of user tests: usability testing, eye tracking, and focus groups test (Murphy 2018). In this study, a usability test was chosen to test the prototype. The initial prototype is the most equivalent sample of the final platform design. Running a usability test allows designers to understand what their users think about it.

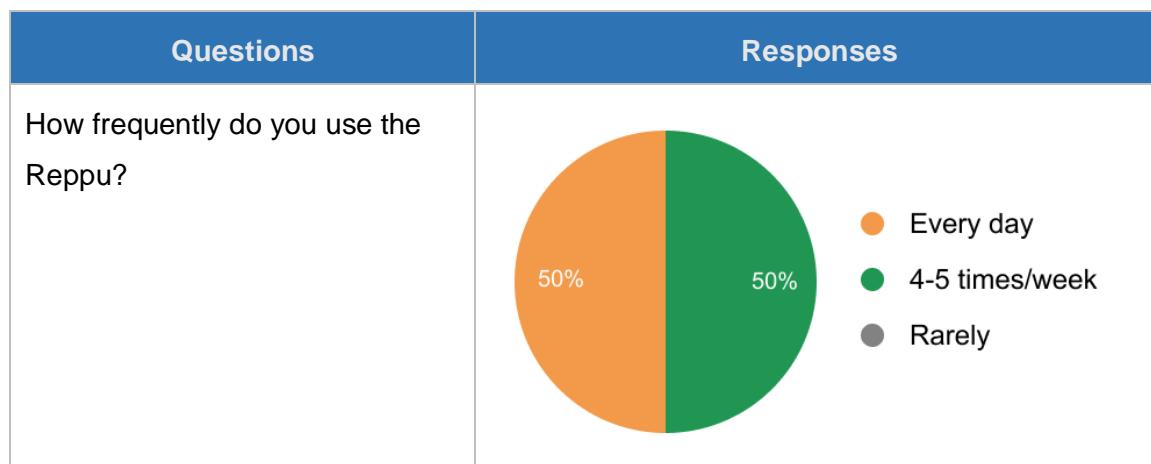
The usability test is an objective method to evaluate the website's usability after designing based on assumptions from previous personas. While having the real users use the prototype, their behaviors and interactions with the prototype were observed and taken

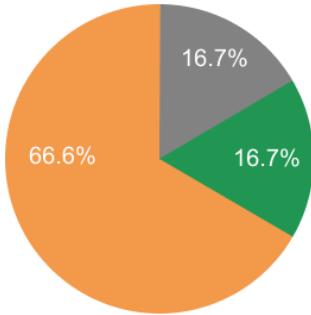
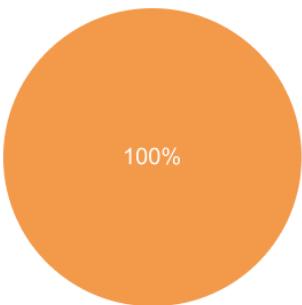
notes. The tester gathered six LAB students in front of the interactive prototype. A list of specific tasks to proceed with:

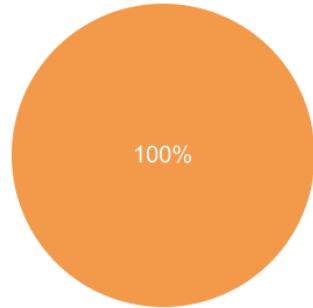
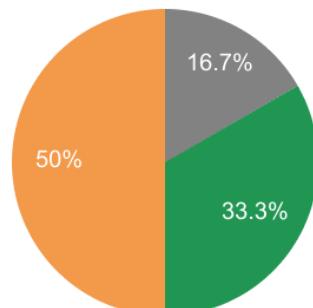
- Log in to the page
- View the course list in the Business and Tourism category
- Try to find one course with the search bar and enroll in that course
- Send a message to one participant in that course
- Add one event to the calendar
- Display only Data Storage course in the calendar
- Mark finished assignments to update the progress bar
- Unenroll from that course.

After the test, eleven questions were conducted on those students. The results indicate that all interviewees are accessing Reppu actively. Five out of six students have positive impressions about the redesigned online learning platform. The improvements in the proposed designs are recognized and appreciated especially in overall structure and additional elements. All interviewees believe that the purpose of this online learning platform is obvious. In addition, features are easy to discover. From the data, it is clear that the redesigned platform is an ideal replacement for the current designs. Table 2 shows the results of this process.

Table 2 Usability test results



<p>How would you describe your overall experience with the new design?</p>	 <table border="1"> <thead> <tr> <th>Satisfaction Level</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Great</td> <td>66.6%</td> </tr> <tr> <td>Good</td> <td>16.7%</td> </tr> <tr> <td>Neutral</td> <td>16.7%</td> </tr> <tr> <td>Bad</td> <td>0%</td> </tr> </tbody> </table>	Satisfaction Level	Percentage	Great	66.6%	Good	16.7%	Neutral	16.7%	Bad	0%
Satisfaction Level	Percentage										
Great	66.6%										
Good	16.7%										
Neutral	16.7%										
Bad	0%										
<p>What did you like the most about using the redesigned Reppu?</p>	<ul style="list-style-type: none"> The organized content The implementation of the navigation bar and hamburger menu Calendar page Progress bar. 										
<p>What did you like least?</p>	<ul style="list-style-type: none"> Helps feature is unnecessary. The profile picture in the top right navigation bar doesn't look like a clickable button. Black theme. 										
<p>What surprised you about the experience?</p>	<ul style="list-style-type: none"> The online learning platform's structure is easy to understand. Well-implemented layout and colors. 										
<p>What caused you frustration?</p>	<ul style="list-style-type: none"> The loading speed of the prototype The interaction between screens. 										
<p>Do you understand the purpose of this platform?</p>	 <table border="1"> <thead> <tr> <th>Response</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Understand</td> <td>100%</td> </tr> <tr> <td>No</td> <td>0%</td> </tr> </tbody> </table>	Response	Percentage	Understand	100%	No	0%				
Response	Percentage										
Understand	100%										
No	0%										

<p>Is the site easy to navigate?</p>	 <ul style="list-style-type: none"> ● Easy ● Difficult
<p>Did you notice whether there was an alternative way to access the course?</p>	 <ul style="list-style-type: none"> ● Yes ● Maybe, if I can try again ● Neutral
<p>What did you think of the layout of the content?</p>	<ul style="list-style-type: none"> ● Very systematic and clean ● Coherence ● Easy to remember where the elements are.
<p>What would you like to change the proposed design?</p>	<ul style="list-style-type: none"> ● The visual look is great. However, it hasn't had real interaction between screens. For example: how the navigation bar will slide to appear on the screen. ● Some pages haven't been designed yet.

7 RESULTS AND SUGGESTION OF THE ITERATIVE PROCESS

After the first round of research and redesign process, the proposed Reppu was improved partly. The limitation of this study is the duration of the redesign process. Because of that drawback, only the initial proposal and user testing were implemented in this study. The design process wasn't repeated to meet all expectations and satisfaction. However, the tests identified the major pain points with amended ideas for future developments:

- Implement the chatbot and FAQ and help students solve the frequent issues with Reppu
- Develop the platform to cover all redirected links (links for students and links for teachers)
- Minimize the necessary clicks to archive the final purpose
- Accelerate the page load speed
- Enhance user experience in mobile application
- Encourage students on their study progress.

Once the designs are launched, it's the starting point of the journey. Ideally, further testing is needed for issues detection or feature improvements. The iterative process is suggested in this study. According to Kriti Kristan (2020), the iteration can be applied at any stage of the process. Nevertheless, the sooner the defects are detected, the lesser consequences bring. After receiving feedback from users, it is the standard timing for the new round of design thinking process. Following that, a new round of the process is started again and repeated until it fulfills all requirements. The published pages are the best practicable product.

Although there's always room for amending, the iterative process is not an endless loop. There are three ways to approximate a suitable stage to stop:

- Stop iterating is based on the timeline for the UX process.
- Requirements are met
- When the fatigue hits and there's no more inspiration. (Krishan 2020.)

8 CONCLUSIONS

This study aims to improve students' experience while using Reppu – an online learning platform at LAB. According to the interviews and survey results, the main problems of this platform are the overall structure and visual look. The next step of the design process is giving assumptions about what users need. Afterward, the redesign is proceeded based on previous beliefs. By proposing a new look for Reppu – an online learning platform, the potential problems are revealed and eliminated partly.

A usability test was held to test the prototype and gather feedback from the real user. As described by interviewees in the usability test, suggestions for further refinements are pointed out. The design process needs to be repeated until it meets all satisfactions and requirements.

This thesis used a mixed-method, which applies both primary and secondary data collection. The primary statistics were collected from the interviews and surveys. Secondary data were conducted from books, research articles, and other relevant sources. The objectives of the study were achieved with the proposed changes. The research sub-questions were fulfilled through the redesign process. Therefore, the reliability of this study can be reflected.

The limitation of this study is technical development. Although the study meets the principle of design thinking theory and approach, the final product is used for testing purposes. The outcome of the study is a high-fidelity interactive prototype. The importance of technical development was not mentioned and implemented.

The research results and proposals have certain reliability and validity at the time being. Therefore, the process should be repeated with additional research and testing. In this study, only the obvious usability disasters were found and modified. The iterative process might have a smaller potential for enhancement since the major problems were fixed. Further research and improvement are suggested, which are the necessary parts to maintain the validity of this study.

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