



# GAMIFICATION

## TO IMPROVE A

## SERVICE

## EXPERIENCE

A CASE STUDY OF  
SERVICE EXPERIENCE  
IMPROVEMENT USING  
GAMIFICATION IN A  
PRODUCT FEATURE  
DEVELOPMENT

Master Thesis By Ema Gröber

## Acknowledgement

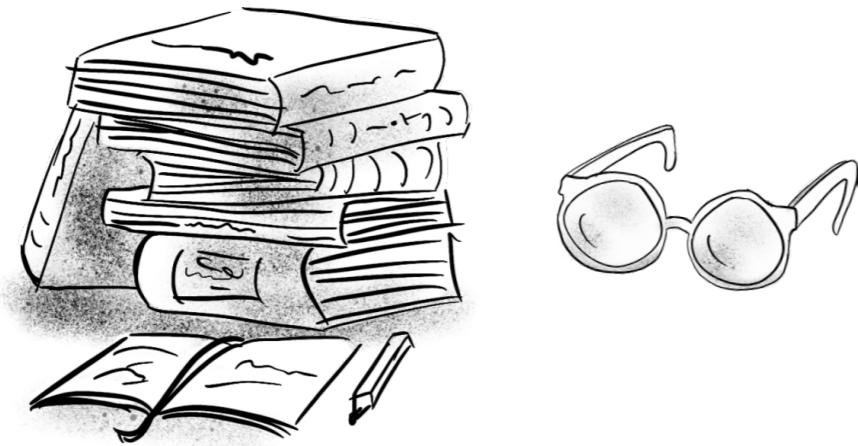
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*Copenhagen, September 09, 2019*

*Ema Gröber*



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Secretary	Judi Stærk Poulsen
Company Team Assistance	Rasmus Sørensen, Mads Nedergård, Dan Meakin and Sean Powell
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Lix Technologies  
Ny Carlsberg Vej 80, 3 sal.  
319  
1760 København S  
Denmark



AALBORG UNIVERSITY  
DENMARK

Aalborg University Copenhagen  
A.C. Meyers Vænge 15  
2450 København SV  
Denmark

# Abstract

The thesis addresses Gamification as a method to support and improve the service experience within the study application Lix. The research is created around the case of a new feature development within the Lix Technologies platform, done during the period February - September 2019. The project focuses on changing the students' efficiency and experience during their studies with the involvement of the Lix application. In order to create a successful concept, the students were involved in the process. This allowed a better understanding of their needs, pains and expectation and involving them in the Co-creation of the project allowed for the development of a product that meets the users' needs. The case was completed with the design of a new feature called *Time to read*, which combined with Gamification would improve the students' efficiency and motivation towards reading the required content for their studies. The feature was developed as a part of the existing Lix platform.

Furthermore, the case was used to further research the effect of Gamification within the area of education and how its implementation could provide additional value to the student. The research used for this thesis supports the process of Gamification and provides a base for further exploration of the necessary knowledge and tools that could help implement game mechanics into a study platform.

# Thesis

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# Learning

# goals

This section focuses on the official learning goals for the Service Systems Design thesis provided in the Study Curriculum (Aalborg University.2017), as well as the personal learning goals that have been defined for this thesis.

Official learning goals
<p>Students who complete the module will obtain the following qualifications:</p> <p><b>Knowledge:</b></p> <ul style="list-style-type: none"> <li>• Must have knowledge about the possibilities to apply appropriate methodological approaches to specific study areas.</li> <li>• Must have knowledge about design theories and methods that focus on the design of advanced and complex product-service systems.</li> </ul> <p><b>Skills:</b></p> <ul style="list-style-type: none"> <li>• Must be able to work independently, to identify major problem areas (analysis) and adequately address problems and opportunities (synthesis).</li> <li>• Must demonstrate the capability of analysing, designing and representing innovative solutions. • Must demonstrate the ability to evaluate and address (synthesis) major organisational and business issues emerging in the design of a product-service system.</li> </ul> <p><b>Competencies:</b></p> <ul style="list-style-type: none"> <li>• Must be able to master design and development work in situations that are complex, unpredictable and require new solutions (synthesis).</li> <li>• Must be able to independently initiate and implement discipline-specific and interdisciplinary cooperation and assume professional responsibility (synthesis).</li> <li>• Must have the capability to independently take responsibility for own professional development and specialisation (synthesis).</li> </ul>

Personal learning goals
<p>In addition to the goals set by the study board, I have created a set of personal learning goals for the thesis:</p> <ul style="list-style-type: none"> <li>• To apply my service design knowledge into practise within the Lix business case.</li> <li>• To co-create with many different actors and involve the customer throughout the design process.</li> <li>• To utilize my graphic design knowledge and use it within the design process.</li> <li>• To contribute to Lix Technologies with the insight of this project.</li> </ul> <p><b>Motivation</b></p> <p>My personal interest is related first to the passion I feel for service design and how versatile it is. And second I am able to improve a product that is creating an impact in the world and not only a product to make a company profitable.</p>

“

Digital tools should benefit the students efficiency, productivity and provide digital content for their convenience.

”

Howell & O'Donnell, 2017



# Intro duction

## EDUCATION IN THE DIGITAL ERA

---

The world has changed drastically within the past few years. The Digital Age has introduced us into new ways to interact with information, changes dramatically the way humans live their lives. Nevertheless, when we talk about education, it is important to ask ourselves why has education remained relatively the same in the last decade.

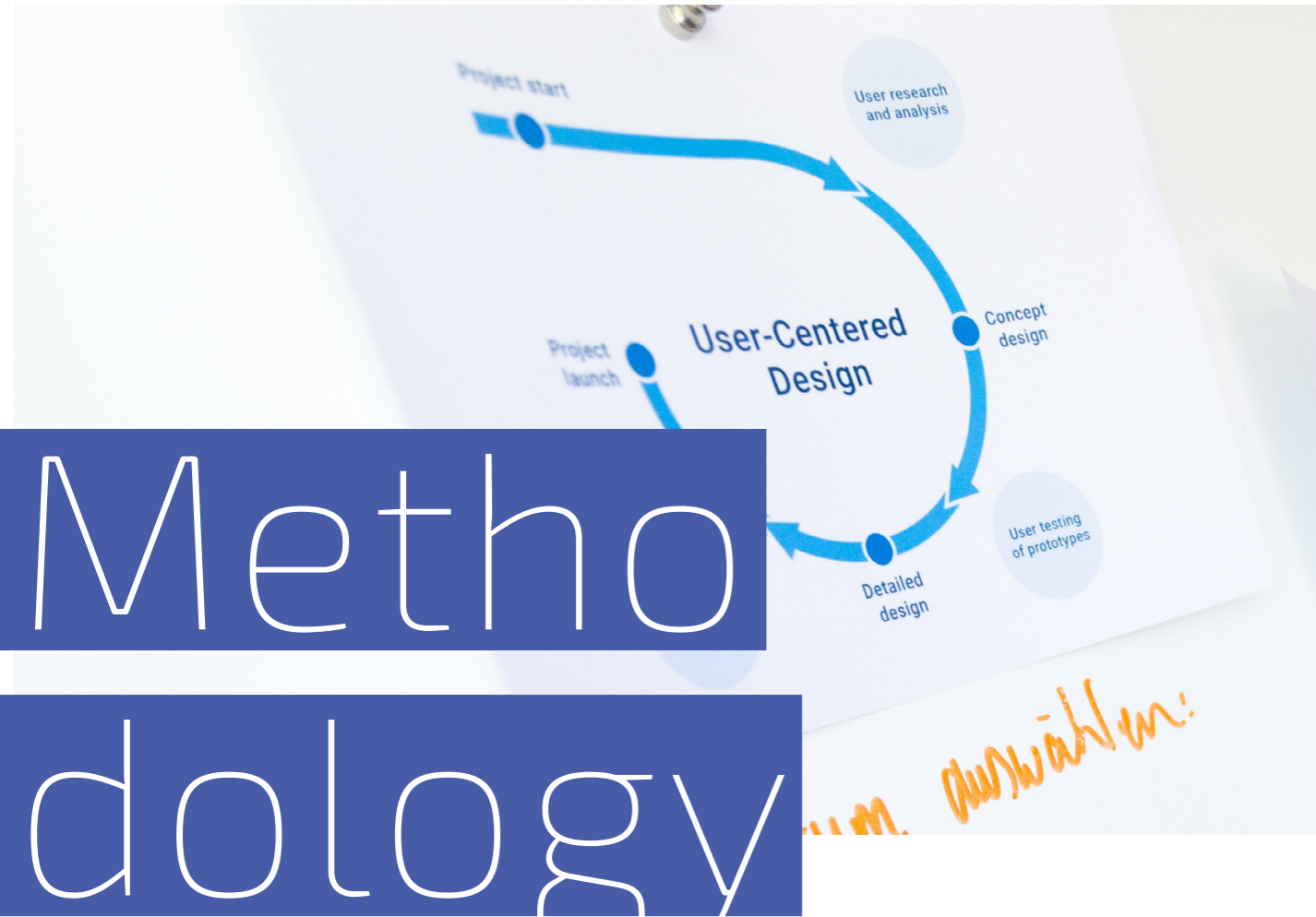
Education has become a priority for many people around the world. According to the University World News, students enrolled into higher education would double by the year 2025 (Maslen, 2012). In order to support and help that many students, learning should become easier with the help of technology.

"Technology is playing more of a role in society as well as in the classroom and can be a powerful tool in enabling deeper learning. However, technology is only effective when used to provide access to richer content, develop stronger teaching practices, make links between classrooms and life, and enable assessments that align with learning expectations and outcomes" (Howell & O'Donnell, 2017)

Technology has began to affect both teachers approach towards teaching and students way of learning.

According to Digital trends and initiatives in education (Howell & O'Donnell, 2017), school technology tools must help the students engage in their education and help them improve their learning. Digital tools should benefit the students efficiency, productivity and provide digital content for their convenience (Howell & O'Donnell, 2017). According to the research, digital tools need to allow adaptive and personalized learning, allowing students to adjust their study process according to their needs.

The thesis focuses on a collaboration with Lix Technologies, that aims at improving and developing further their digital study platform. As they strive to improve the students' reading and learning experience, this thesis will focus on using Service Design to Co-create a better student experience and resolve any pains they face during their education. In addition, this collaboration will take into consideration how could Gamification provide additional value to the Lix application and how could it be incorporated, in order to support the students during their studies.



Methodology

Methodology

THE MAIN FRAMEWORK USED IN THIS THESIS IS THE DOUBLE DIAMOND, SUPPORTING THE SHIFT OF MINDSET BETWEEN THE DIFFERENT PHASES OF THE DESIGN PROCESS (MORITZ, 2005)

Double Diamond design phases:

- Discover
- Define
- Develop
- Deliver

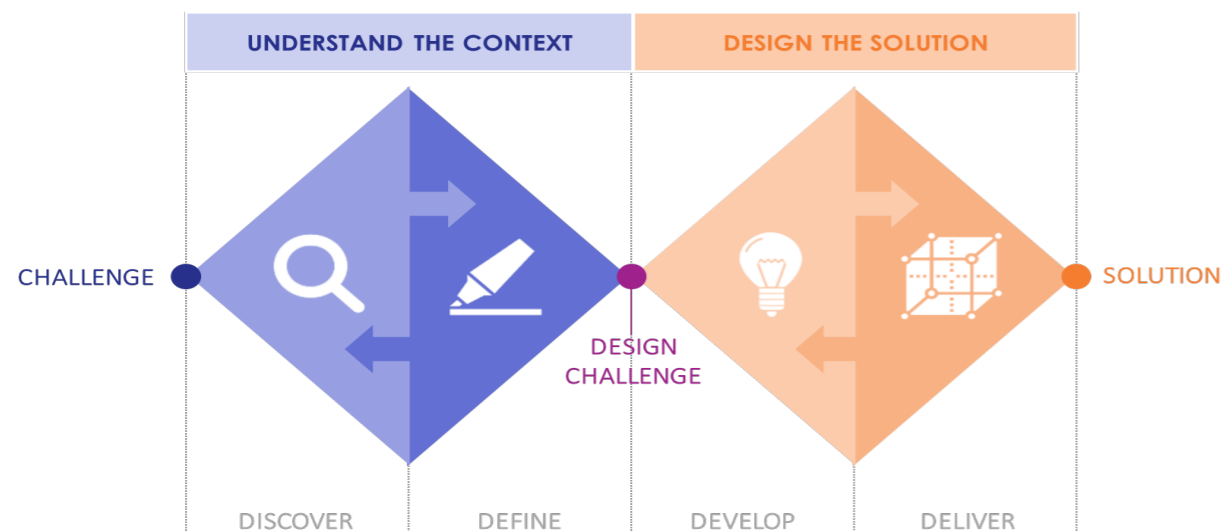


Figure 1: Double Diamond

## Methodological approach

This section will focus on the methodological approach used to gather the research and gain the required knowledge to create a successful solution for the Lix company. Additional focus will be given over the theoretical frameworks and methods used within the design process.

### Double Diamond Model:

The main framework used in this thesis is the Double Diamond, supporting the shift of mindset between the different phases of the design process (Moritz, 2005). The model divides the problem solving processes into four stages: Discover, Define, Develop and Deliver. Each stage provides a framework of the process necessary to solve the problem, by exploring the process needed to create a tangible solution. Nevertheless, the method could be interpreted as a suggestion to the way of designing a solution, as the process is nonlinear and the designer could go back within a stage and explore it further. Figure 1 represents a visualization of the Double Diamond Model and its four stages. Furthermore, the aim and process of each stage will be explored further in the following section.

#### DEFINE

During this phase the mindset of the designer should be into an analytical mode (Design Council, 2007). A way to do that is by concentrating at the main concept the master thesis will work with to develop the solution: Gamification. This will be broken down into gamification frameworks, gamified educational examples and the Educational Gamification Guide, which will guide the general gamification design framework in the following sections of this report.

Following the educational guide framework the target group and more specifically the Generation Y will be presented as the main users of the product and the thesis designed solution. These will be summarized in the Personas that describe the different types of students the thesis will take into account.

The second part of the section will comprise the description of the current Lix product experience with the use of a Customer Journey, Storyboards and a Value Constellation. A later development of these will enable the thesis to demonstrate the clear value creation the solution brings to the user experience.

#### DISCOVER

The first part of the discovery phase is a description of the Case provided by Lix Technologies, where the company's product and strategy are presented. This includes an explanation of the role the thesis played in the development of the company's product offer and the role I played as a UX Designer while writing the thesis.

As second part, relevant sources around Education in the Digital Era are presented to give the thesis a context into the industry and how the product Lix Technologies is developing fits the education area. Together with this general context, the main findings collected during a general student research will be presented, highlighting the most relevant findings for the context of the Master thesis research.

At the end of the Chapter a problem statement will be formulated as a way of summarizing the main design challenge for the next phase.

#### DEVELOP

During this section the design process should focus on the creation of possible solutions and testing them with real users (Design Council, 2007). For this process the Master thesis used two different workshops with relevant stakeholders. The first one is the Co-creating workshop made with students, that will present the direction of the solution from the User perspective.

The second workshop is a Co-design workshop with the Developers of Lix Technologies, who gave a more tangible input to define which parts of the solution were feasible. Utilizing the stakeholders input, the thesis defined a concrete idea and prototyped it with target users. A prototype test will be conducted, in order to define a clear Service concept.

## DELIVER

This last phase of the report will be represented as the Product report and will contain the main information in regards to the Solution created in the Master thesis. As a first section the report will describe the context in which the created feature will be in relation to the existing product Lix Technologies provides today.

As a second section, with the use of a Customer Journey, will provide the possibility to present how the solution improves the students journey, presenting an improved version of the existing one. Together with a UX model and a group of Scenarios the mechanics of the gamification and the steps the user goes through will be depicted. The Value Constellation and the Motivation Matrix will provide a better insight on the value the new concept provides for the main actors.

Finally the Chapter will conclude with suggestions for implementation, where the thesis provide the company with reflections on how the solution could work in the future, when the gamification elements become more complex and evolve in time.



## Service design

As Service Design is a relatively new and constantly developing approach, many different descriptions of the approach have been created. In order to keep this thesis coherent, the Service Design description followed is the one provided by Stickdorn and Schneider (2011) in their book *This is service design thinking*. Service Design is not a set process, rather it is a way of approaching a problem. Therefore, there is no one textbook that could represent the approach, but rather the desire to try, fail and learn from your mistakes, in order to improve and try again.

To gather a better overview of the Service Design approach and its possibilities, the main principles used within this thesis would be explored further. This will provide a better understanding of the possibilities a collaboration with the customer could bring toward the development of the service.

### USER-CENTERED DESIGN

The involvement of customers within the service design process could provide a better understanding of the users needs and pains, as well as insight on their expectations. This involvement could provide value when developing a successful service. In order to so, the designer should never assume what the customers needs are, rather they should involve them into the ideation and design of the service. User-centered design is focused on understanding the customers, gathering knowledge about them in a passive, observant way. This is usually done by interviews or observations. This could provide a valuable base for the research process and gathering the initial knowledge to start narrowing down the problem.

### PARTICIPATORY DESIGN

While the user-centered design focuses research and design done on the behalf of the user, Participatory design focuses on involving the customer in the design process (Spinuzzi, 2005). The user should be considered a part of the team, providing valuable insight and having the freedom to express their opinion. In addition, the customers should be involved within the decision making process and the creation of the service. This would result in a more accurate and tailored solution that will fit the users needs and help solve their pains.

### CO-DESIGN & CO-CREATION

Within the area of participatory design, the methods of Co-creation and Co-design have been gathering popularity (Sanders & Stappers, 2008). The two terms have been confused and sometimes considered as the same method, therefore a comparison and further explanation of the two will be delivered.

Co-design, like participatory design, requires the involvement of the customers. Although similar, Co-design focuses on including the users within the development of the process (Spinuzzi, 2005). The method gathers the insights and values the customer contributed and evaluates them throughout the process.

Co-creation focuses on any act of collective creativity (Sanders & Stappers, 2008). This allows the customers to collaborate and provide their creative input on specific topics. Co-design is considered as a small part of the Co-creation process, focusing on one specific area of the project. It represents a collaboration between designers and customers, that are not knowledgeable of the design processes.

This project would focus on the Co-creation process, involving the customers in order to allow the creation of a valuable and successful solution. The Co-creation method would refer to all the activities that are executed, so they create value to the customers. The Co-design method will refer to the specific area the customers are involved into the design process of the project.



## Research through design

In the past, design and research have been separated as two different ventures. In the recent years, research has become a crucial part when designing products and services (Stappers & Giaccardi, 2013). In addition, the design activities and the artefacts connected with them have become an important element of gathering knowledge and insight. The research through design method represents a new way of doing design as a part of the research process.

In service design, research has been used to gather information about people, get a better understanding of them, their motivation and behaviour (Stickdorn, Hormess, Lawrence, & Schneider, 2018). This allows to create empathy with the users, providing a better idea of their needs and pains. Research provides the design team with enough knowledge to help them avoid assumptions, rather base their ideas and solutions on the data gathered from their customers.

There are many different methods for research, but in order to gather the right insight and create a successful solution, a mix of methods should be used. This will prevent the designer from relying on their assumptions, while the customers can share their insight and experience. The research methods that are required for successful design are:

- **Desk research:** preparatory research and secondary research
- **Self-ethnographic approach:** autoethnography, online ethnography
- **Practical approach:** participant observation, contextual interviews, in-depth interviews, focus groups
- **Non-participant approaches:** non-participant observation, mobile ethnography, cultural probes
- **Co-creative workshops:** co-creating personas, journey maps, and system maps

(Stickdorn, Hormess, Lawrence & Schneider, 2018)

Using more methods allow to gather customers insight and whenever the same insight and data is collected, it provides a confirmation about its relevance to the project. Nevertheless, the design research does not investigate validations, rather it seeks quality insight that could be used within the design process.

In order to gather the necessary information to start the design process, desk research was done. It focused on gathering relevant information from papers, articles and conferences. To find relevant information, the AAU online library was used, as well as Google Scholar. This ensured quality resources on the research topic.

Surveys and interviews were conducted as part of the research in order to gather a better understanding of the students and their pains regarding education. The surveys were a method to gather quantitative data, allowing the results to be measured, answering the "what" and "how" of the experience (Stickdorn, Hormess, Lawrence, & Schneider, 2018). On the other hand, the interviews provided qualitative data, getting a more in-depth insight on the issues uncovered by the survey. The qualitative methods provides a better insight on the customers needs and motivations.

As mentioned in the previous section, Co-creation workshops provide in depth insight of the customers pains and need, and when used properly helps create a solution that would make it more personalized and bring value to the users. This could also be regarded as a research through design - involving the students in the creation of a process provides not only ideas for further development but also data qualitative on their expectations regarding the concept. In addition, creating a prototype is another way to validate and research the feasibility of the concept. Prototyping is an important process that reduces the risk and uncertainty of the quality and value to concept provides, without putting too much effort and money into its development (Stickdorn, Hormess, Lawrence, & Schneider, 2018). The test of a prototype can often create new question regarding the concept, requiring the designers to enter the research stage of the process yet again and what can be done to achieve the perfect final solution. According to Stickdorn, Hormess, Lawrence, & Schneider (2018), prototyping can be perceived as a research that is focused on the future development of the solution.

The Service Design process strives to create an innovative and sophisticated solution. In order to do so, the designer should go through many research cycles and developments (Stickdorn, Hormess, Lawrence, & Schneider, 2018). Therefore, this thesis will focus on researching through design, gathering feedback and insight from the users and researching through each stage of the process.

# 1. Discover

1	Case Introduction: Who is Lix Technologies?
2	Education in the Digital Era
3	Students insights
4	Problem statement



# Discover

# phase

The discovery phase will focus on introducing Lix technologies and their future vision of the application. In addition, this phase will further explore the changing in education within the Digital age and how that reflects Lix's strategy in the future.

In order to get a better understanding of the students' needs, pains and expectation, the discover phase will explore a student survey that focuses on gathering insights from the students and explore what additional features Lix can develop, in order to help students perform better during their education.

## 1.1 Introduction to Lix

Lix Technologies is a startup founded in 2015 by Camilla Hessellund Lastein. The company focuses on the Educational industry and started as an online platform where students can buy their textbooks. This was the first step leading to Camilla's dream of creating the "Spotify of textbooks". The initial platform allowed students to search through their digital content, highlights and notes. In addition, the prices of digital books was 60% cheaper than the printed editions of the same books (Farmbrough, 2018).

In August 2018 Lix finally launched their first two cases of a subscription, specifically created for students from the universities of BSS and SDU. The launch of these subscription cases was the first step towards creating the "Spotify of textbooks" Lix is aiming to be. With growing numbers of subscription offers to different universities, Lix is aiming to elevate the application from a simple e-reader to a smart study tool that could help students through their education. Throughout the years Lix has been used by many students from different educations and countries, as well as by gymnasium students. But with the recent incorporation of the Lix subscription, the main target group has shifted to students from the Business and Economics education.

### LIX STRATEGY

Lix is aiming to "change the way the world learns" (Lix Technologies, 2015) by harnessing technology and data-driven learning to transform how world-class content is delivered, consumed and shared. Their goal is to create a smart study tool that unites books with the platforms and tools students use.

According to their playbook (Lix, 2019), Lix provides an all-in-one platform that allows students to learn at their own pace. In addition, they can find all their digital textbooks and required courseware in one place for an affordable and budget friendly monthly subscription. Lix dares to change education by challenging the old and outdated approach that is still used today. The company wants to take learning into the 21st century, and to do so, they believe the initial step is to digitize all the textbooks in the world. Their aim is to push the boundaries of the existing educational technologies and their impact on the world, while creating a platform and community for students in higher education. Lix strives to make education affordable and accessible for everyone, providing the best opportunities for each and every student, while taking into consideration their individual learning methods to help them perform better and realize their full potential.

Lix Technologies vision is to transform the way students worldwide learn by providing them with a more accessible, powerful and collaborative platform. Lix believes they could create the best learning platform in the world, that is surrounded by a global learning community that will bring educators, learners and content creators together to increase academic freedom and offer infinite learning possibilities

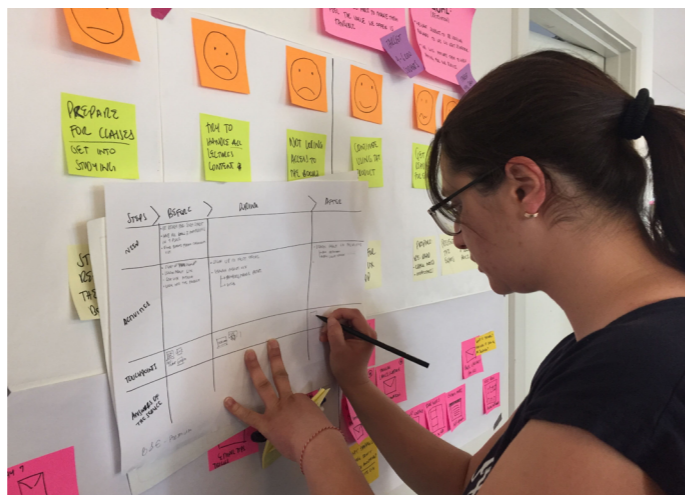
In order for Lix to prove that the future of textbooks is a subscription based model, they have focused on releasing their Lix subscriptions to students in the Business and Economy field. This allows for a better understanding of the students and provides measurable data of the subscription success. In addition, Lix strategy focuses on providing additional value to the subscription and creating more features that will assist students in their everyday life.



## ROLE INSIDE LIX TECHNOLOGIES

I became aware of Lix while I was searching for my Service Systems Design internship. I was taken into Lix as an intern for a six month period, to work and learn from the company's Service Designer María Saavedra. Soon after my internship was finished, I was hired as a student/part time service designer, in order to help the company develop and grow further. During my one year work with Lix, I have gained valuable knowledge of the students and the Lix users, which has allowed me to help the company shape Lix into the study tool they envisioned.

When I started my internship, Lix was a digital platform that provided online access to study books, as well as the ability to make highlights and notes within the content. In addition, I was honored to be a part of the first step of the new subscription release. As we were gaining more knowledge of the students needs, pains and expectations, we started to work more on the application and transforming it to fit the student's needs. Currently the Lix application has been developed to allow uploading of PDF-s, has an incorporated dictionary, translate and text to speech functions within the books. Another new addition to the Lix application is a free form note tool, that allows the students to have notes independent from their textbooks. My tasks have been to research similar tools and features, creating mock ups and test the features before and after development.



## THE LIX APPLICATION

Lix is a digital application where the students have access to their books. The application is available for Mac OS, Windows and Linux, but is still not available for mobile phone use, as the application functionality is limited on mobile devices.

The current Lix application (see Figure 2a & 2b) contains all the students books and some main features that will help them to study easier. When opened, the application shows the students bookshelf with all the books available (Figure 2a).

Subscription users automatically have all their necessary books for the semester available immediately after signing in, while non-subscription users have the "7 ways to stay focused while reading digital textbooks" booklet that comes with the app and any books they may have purchased. The app also provides an exam mode that allows it to be used at open-books tests and examinations. From the home page of the application, the students can also search through their books and notes without entering into a specific book.

When using a book, there is an array of features at the users' disposal ( see Figure 2b). On the sidebar there is a content overview that refers the students to the chapter they need, zoom and layout adjustment, notes and highlights overview and additional related content. The related content consist of links, vidoes, podcast or text documents that can help the students get a better understanding of the book's content. In addition, students can upload their own links, in order to keep all relevant information in one place. Within the book, students can make notes and highlights, can translate sections, listen to them or use a dictionary on words they need additional help understanding.

## LIX NEXT

During the internship I was mostly involved talking with the students, conducting interviews and sending out surveys, as well as analysing, summarizing and prioritizing their needs and expectations. This led to a change in the app towards the end of the internship, where the above mentioned features of text to speech, dictionary and translate were added to the application. The new version of Lix was tested and proved to provide more value for the students and was something they were happy to have access to. Currently Lix is working on a new version that will provide even more features to the students. The features are based on the research the UX team had done during the internship, including both general students and Lix users.

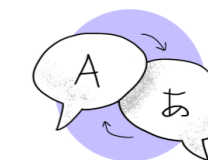
After conducting the research, the team learned that one of the main problems students face, is keeping everything in the same place: keeping all additional documents and notes together. Another issue found in the process was that the Lix users prefer using different note taking tools for their class or group notes. Therefore the new Lix application will provide an option to upload personal PDF-s and have a free form note tool where students can write their class notes independently from the book. The new application is being tested by students, in order to get their opinion regarding the new features, as well as get an overview of any current or potential problems that they may encounter. The new version of the Lix app is expected to be released towards the beginning of the 2019 autumn semester.



SEARCH  
Better than a bookmark



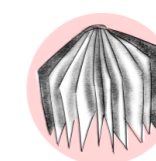
NOTES & HIGHLIGHTS  
Stay organized your way



TRANSLATION  
Translate troublesome text



TEXT-TO-SPEECH  
Listen and learn on-the-go



DICTIONARY  
Understand everything important



EXAM MODE  
Take us with you to your exams

## 1.2 Education in the digital era:

Higher education learning has existed since Plato's time (Baltes, 1993) and has been changing and adapting throughout the years. Since the start of the digital era, physical books have become obsolete and have been replaced by digital versions of them. Of course, not all physical books have been replaced, but the new generation of students has a tendency to prefer online books rather than paper copies.

In addition, the new way of learning is through using digital content, online courses and flipped classrooms. Giving access to teachers and students to new resources and technologies, the trends in education have been changing. According to Clodagh O'Brien (2018), there are eight main educational trends that are changing the face of education. One of the trends is focused on the use of technology and their implementation within education and the students everyday school life. Another trend is that students require their education to be fun and engaging. This required the teachers to implement videos and gamification into their teaching, so the students continue to be interested in learning. Another way for students to learn is flipped classrooms, that allows the student to learn at their own pace and time. According to O'Brien, online courses and distance studies are gaining popularity with young people. Around 30% of students are learning through online courses.

presenting the same text to two different groups - one had to read the text from a physical paper and the other had to read from a digital device. As a follow up, the students were tested on the knowledge gained, where there was almost no difference in their performance depending on the text they read. Students learn and understand equally well, independent of the way they read the content. As a conclusion, Taylor (2011) suggest that adopting digital text may not only be cost saving, but also more convenient for students.

Furthermore, students do not only use digital books during their education but they also use digital technology to help them during their studies. From their personal laptops to their note taking tool, students use the convenience of digitalization on everyday bases. They have become "digital natives" and perceive the technology to be an essential part of education. A research made by Henderson, Selwyn, Finger, & Aston (2015) focuses on the technologies students use during their education, as well as what digital tools they perceive as useful while studying. Not only do students use their laptop for educational purposes on a daily basis, but they rely on them in order to perform better and get the best out of their studies.

Students rely on their laptops to access their "official" digital resources, like their mandatory reading, their learning management systems and online library resources. In addition the research supports the growing numbers of E-books used by the students. Other digital resources students rely on are the online resources like Google and in particular specialized educational search services as well as relying on video content to help them better understand the concepts. Facebook, the well known social networking service, allows the students to collaborate and communicate regarding their education, and not only to use it as a distraction.

According to Henderson, Selwyn, Finger, & Aston (2015), some of the biggest issues digital technology proves to be useful are organizing and scheduling the workload, meeting the requirement for the education and keeping track of their time and managing it successfully. As seen in Figure 3, this issues are one of the top things where digital technology makes a difference.

In order to understand how the education is changing in the digital era, we need to focus on how the students of today read and learn. According to a LJ survey (Enis, 2018) physical books are still preferred when reading for pleasure, but when doing research for educational purposes, E-books become more desirable. Even though they are more convenient, cheaper and easy to search, only 45% of the students rely on digital books. According to Myrberg (2017) research article on "Why doesn't everyone love reading e-books?", there are a number of challenges students face when using E-books. From it being tiring for the eyes and distracting, to being hard to see your progress and get an overview, students have been ignoring the value digital content provides and the many different ways their concerns can be overcome with specific digital tools.

Many students still are under the impression that in order to study better, they need their content to be from a physical source. Although a common misunderstanding is that students consider reading from digital sources as distracting and inefficient. According to studies (Taylor, 2011), there is no difference between learning from digital and physical content. The study focused on

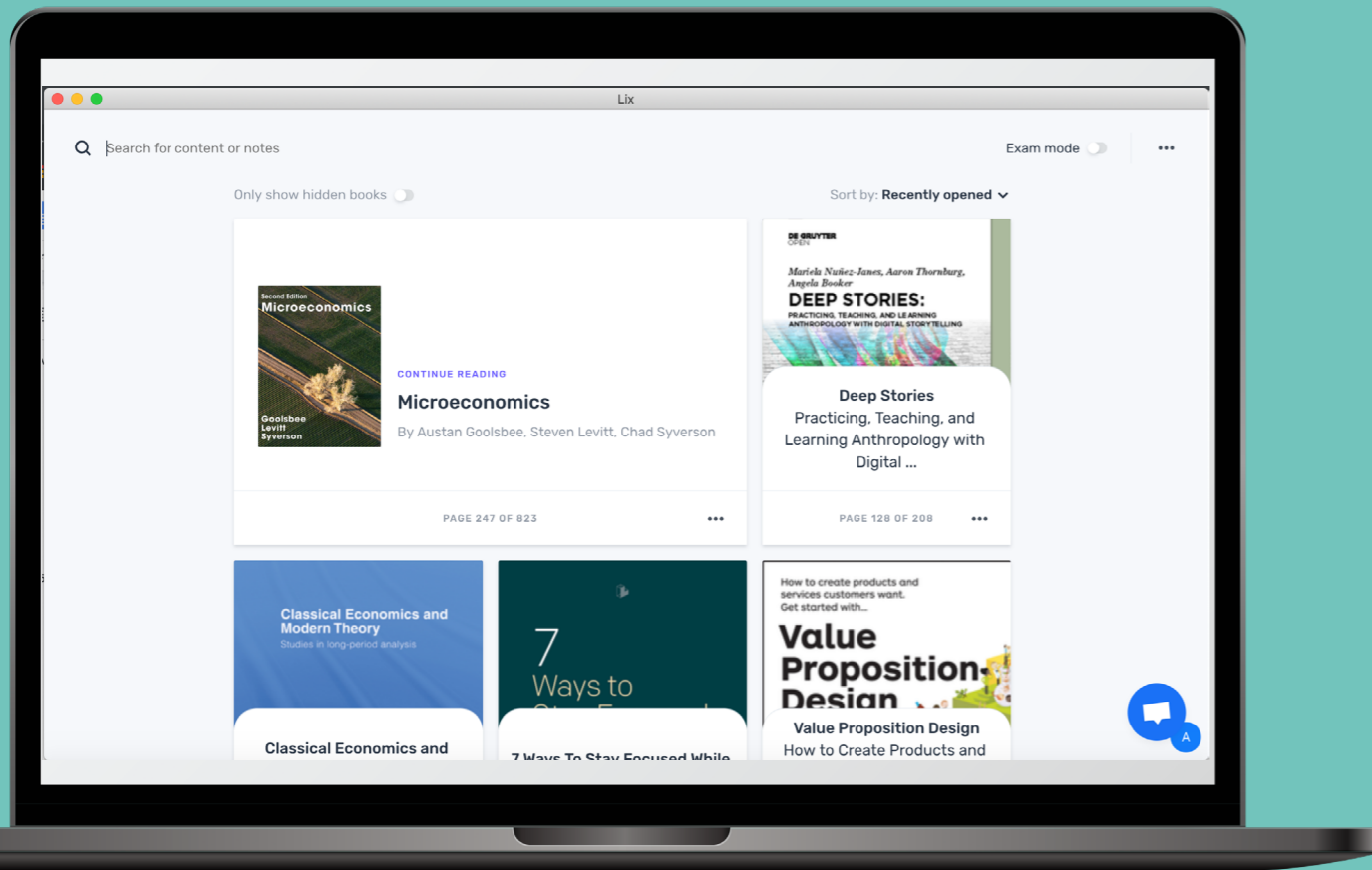


Figure 2a: Lix Bookshelf

Figure 2b: Book within the Lix app



The whole research proves to support digital technologies as a fundamental part of education nowadays. Taking into consideration their day-to-day work, students manage to be on top of their education, helps them perform better and assist them with organizing and managing their workload. Digital technology helps students to additionally support their knowledge, the understanding of the content and improve their performance.

To help students perform better and succeed in their education, there should be a better and deeper understanding of their pains and needs. So it is not a surprise to see that Service Design has been focusing on the improvement of education. Many universities have been focusing on the student experience and how it can be improved. An article by Baranova, Morrison and Mutton (2011) has been focused on finding new perspectives regarding how universities perceive the students and how they can be involved in the service delivery. The aim was to get a closer look of the enrollment and registration process in the University of Derby and with the help of the students, create a better student experience within that process. The authors believe that Service design can allow the students to be a part of the creation of the educational service, as well as give an insight of the students experience and the quality of the service. This will provide a better relationship and satisfactory levels between the students and the University.

In order to create a better student relation in this early stages of the students' education journey, Baranova, Morrison and Mutton (2011) focused on the service holistically. Therefore, they decided to use the Service Design blueprinting technique to map the students' process throughout their enrollment and registration, while aligning it with the organizational structure of the University. This would allow them to get a detailed, in-depth analysis of the students experience throughout the different stages of the process. In the creation of the blueprint, the authors involved over 100 students and staff members, identifying any pains and problems that occur throughout the enrollment process.

By using the service blueprint, Baranova, Morrison and Mutton (2011) have incorporated Service Design within the enrollment process in Darby University and as a result, have proven that it creates value and improves the student experience. Involving students in the design of the service ensured that the students identified their needs and expectations in the future. It allows the students to be a part of the redesign process of their service. Therefore, as Lix wants to create a service that will make students' lives easier, they will be involved in designing the product, in order to ensure that it provides value and fulfills their needs.

**Figure 3:** Digital technology usefulness

Table 4. Cited reasons for digital technology usefulness in relation to students' university studies.

Practice	Description	Digital devices/practices most cited in relation to this factor	%
Organising and managing the logistics of studying	Managing schedules, timetables, fulfilling deadlines and course requirements, 'keeping in the loop' regarding university and course information and news	Learning management system as repository of resources and information	46.9
Flexibility of place and location	Flexibility of location, ability to engage 'remotely' with academic work off-campus, engaging at a distance and not having to be 'present', being able to be mobile, portability of university work	Library databases and library websites; laptop computers	32.7
Time saving	Saving student time, quicker processes, more immediate outcomes, convenient scheduling of activities	Writing notes/word processing; library databases and library websites; online assignment submission	30.6
Researching information	Researching information for assignments; quantity and quality of information access	Library databases and library websites	27.9
Reviewing, replaying and revising	Catching up on missed material, repeating viewing of materials to improve understanding	Lecture recordings (audio/video) of university lectures	27.9
Supporting basic tasks	'Easier' writing of assignments; 'easier' and 'helpful' information management and retrieval of resources	Writing notes/word processing; general Internet search engines (e.g. Google)	26.4
Communicating vs. collaborating	Asking questions and exchanging information; working with other students; sharing ideas; preparing group work	Facebook and other social networks; Google docs, wikis, collaborative documents	16.8
Augmenting university learning materials	Watching lectures, tutorials and talks from outside university; cross-checking and comparing with other sources; 'going elsewhere'	Watching videos from sources outside university; Wikipedia	14.6
Seeing information in different ways	Visualising concepts through video, animation or annotations; allowing real-time lecturer demonstrations and 'board work' in lectures	Watching videos from sources outside university	11.7
Cost saving	Saving money and expenditure	E-readers, online journals and books	4.4
Gauging a sense of progress	Identifying gaps in understanding and knowledge; seeing what other students think; being tested; receiving feedback	Clickers, live polls in lectures; quizzes	4.2

## 1.3 Students insight:

In order to understand the students better and to see how Lix could help them solve their pains and needs, Lix conducted a survey throughout students in Denmark (see Appendix 1). As a Service Design intern in Lix at that time, I was involved in the creation of the survey and analyzing it. The survey was done digitally, send through Facebook pages that are exclusively for students. Thanks to my status as a student, I managed to share the survey around within pages like the AAU student page, kollegium pages and also used my network to help me fill it in and share it with other students.

The survey was answered by 100 students from different countries of origin, universities and educations. The survey contained around 40 questions that could help us get a better understanding of the students and their needs, behaviour and experience throughout their education. The survey was divided into six different areas - General information, Before the semester start, The study process, Collaboration, Exam period and Conclusion. My main focus will be on the Conclusion part where students had to focus on their overall challenges during their education and their expectation of a digital tool that can help them be better and more efficient students.

One of the main questions was their preferences over physical and digital books, where only 34% of the students confirmed they read E-books. Some of the reasons the rest of the participants prefer physical books was that it is easier to read, it does not strain the eyes, provides better highlight and notes or is distracting. This was an important insight, as we needed a better look over the use of digital books and a way to understand why students would choose physical books over digital. Having this information would help us think of ways and tactics that can appeal even to students using only physical books and even give them a platform that provides better value for them.

As Lix main goal is creating a smart study tool, the survey included a section with questions about their biggest issues during a semester, what could help them get better and be more efficient students and how do they envision a smart study tool.



Although the questions were different, there was an overlapping of the students answers. As the survey was with open ended questions, they had the freedom to answer whatever they were thinking. The most common issues students encounter were managing time and tasks, having too much workload that is uneven or overwhelming and having trouble organizing and structuring their content, notes and highlights. In addition, many students have a hard time understanding the content, differentiating what to read and what is relevant, as well as keeping themselves motivated to read on time and prepared.

In order to select the most important pain points the students have during their education, the Lix team sat down and created a visual to better understand and visualize the issues at hand (see Figure 4). The visualization focused on students' problems that Lix could help by creating additional features to their application. A hierarchy table ( see Table 1) was created and based on the percentage of participants that have mentioned the particular issues the most. As a result, time & task management was the most important problem students encounter, especially when asked what could help them be a more efficient student.

**Table 1:** Hierarchy of students pains

1. Time and Task Management
2. Organization
3. Workload
4. Content Understanding
5. Motivation

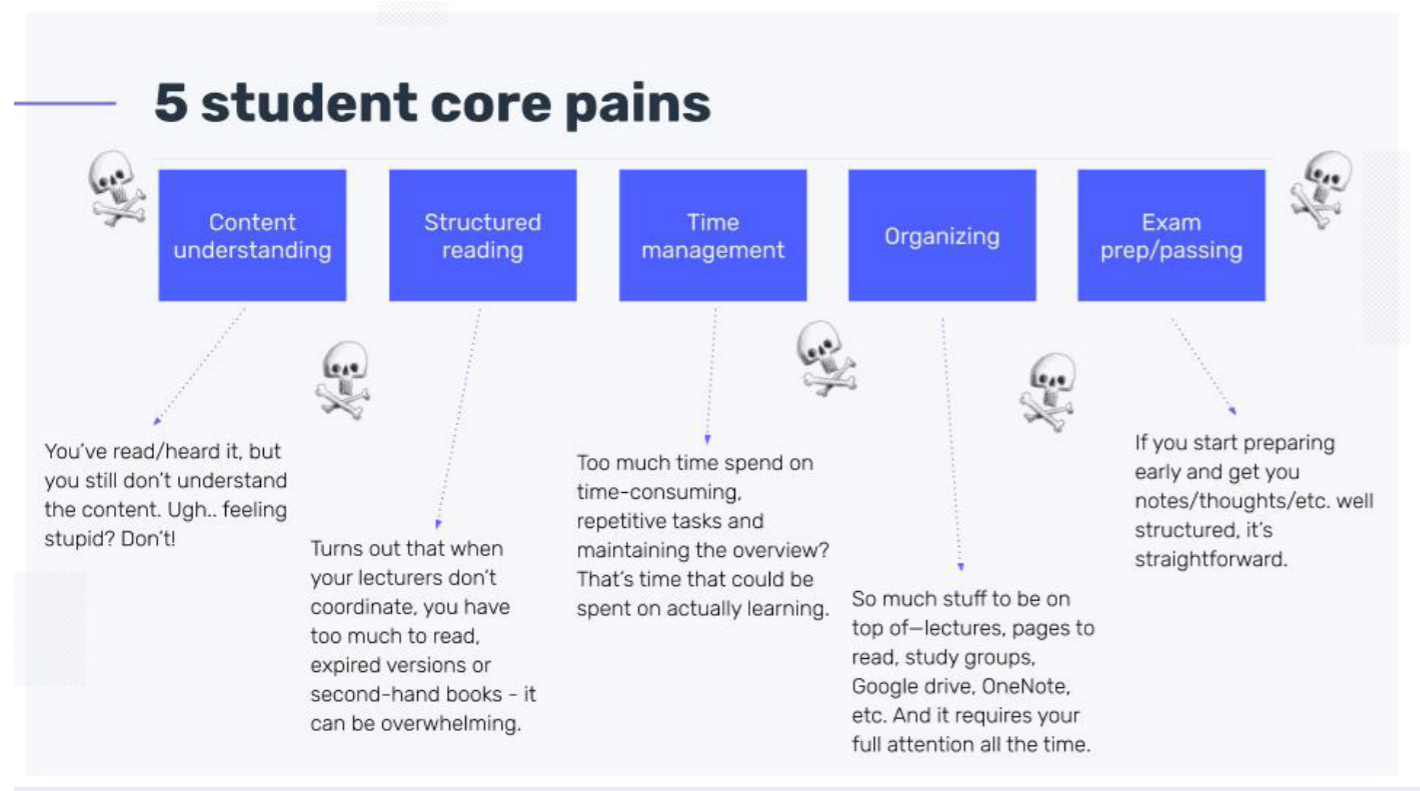
Furthermore, a "smart study tool" was portrayed as a tool that could help students track their task and time, as well as have everything in one place. Another important attributes the tool should include is a function that will help them get organized and structured, as well as to help them be more motivated during the semester.

## 1.4 Problem statement

As mentioned above, I had spent my Service Design internship working closely with Lix Technologies. As a result, I had a very comprehensive knowledge of the students, the areas where Lix wanted to improve the students' experience and their future goals. Based on my knowledge and the information gathered within the Discover sections of the project, I had a clear overview of the problem that the company was aiming to solve. They strive to change the way students read, by introducing them not only to digital content, but also include tools that can help them improve their studying.

As a result of the students insights and my experience within the Lix company regarding students pain points, the following problem statement was formulated:

**Figure 4:** Students's core pains



“

How can Lix develop a more effective study application, while addressing student pain points and meeting their needs and expectations?

”

# 2. Define



## Define phase

The define phase will focus on the information gathered from the discover phase and synthesising it into a more defined problem to work with.

As mentioned above, my experience during the internship at Lix and the research conducted throughout it, had already provided the direction of this project. The research uncovered that, in order for Lix to create a smart study tool and provide additional value to the customers throughout their subscription, they needed to fulfil many students needs and expectations.

Throughout the survey data collection, it was clear that the students are facing the problem of efficient studying. In particular, their main challenges within that area are time and task management, organization, workload, content understanding and motivation. By defining the target group, get a better understanding of the Lix users and their journey through education, will allow a better focus over their main needs.

- 1 ..... Gamification
- 2 ..... Target Audience
- 3 ..... Defining the learning objectives
- 4 ..... Structuring the experience
- 5 ..... Research Area



Field of Research:

# Gamification

Lix has been striving to create the ultimate "study tool" and has explored many different ways of achieving that goal. The topic of gamification has emerged during many conversations within the company, especially when ideating the future development of the application. Based on the students insight the company had identified the five main problems they encounter during their education. Thinking of possible solutions and gathering ideas for additional features, the team had come up with gamification as an additional element of the platform. If used correctly, Gamification could provide value and accompany some features of the application, as well as act as a solution towards one or more of the five main pains. Therefore, this thesis will explore further the topic of Gamification and how it can help Lix create a more fun and efficient platform for the students.

As Gamification has been becoming a part of many services within different non-gaming areas, it has become a huge part of the creation of the user experience and engagement. Having this in mind and the fact that Service Design focuses on the improvement of the customer experience and engagement Klapztein and Cipolla (2016) have been diving into the matter of transforming game design as a part of the Service Design field. The aim is not to create a game of the service or the product, rather than create engagement through a gamingfun game element. Successful Gamification needs to be embedded into the process and not be added later on as an addition to the service.

By utilizing game activities, it motivates the reflects the users motivation to do an action or interact with the service in a positive way. According to Huotari and Hamari (2017) Service Design has a very broad description, therefore all systems providing value could be considered as service systems. In addition, Gamification and Service Design complement each other on many different levels. Games require the active participation of the player, creating the actual service experience.

Both fields focus on the users participation, co-production and value creation, in order to create a successful product. The users use their knowledge, their experience and needs, to shape the product in a way that will mold it to their expectations. The main goal of gamification is to create value and a better experience, without distracting the user from the core service.

Gamification has been making its way into many businesses and processes, in order to better engage the customers. In addition, Gamification has evolved into a digital game-based learning (DGBL), where it aims at engaging the students and creating a more effective and interesting educational environment. According to Jeng-Chung Woo (2014), DGBL has the potential to improve and increase the student's motivation towards learning. According to studies, gamification affects the students' motivation, as the mechanics of it engages them in the learning process. The students desire to be effective and to reach a certain achievement should be determined by their actions. Using DGBL increases the interest as well as integrated visual, auditorial and textual presentation of the content, which is easier to remember. The DGBL experience should be at a medium hard level, as something too easy discourages the participants, as well as to provide a feeling of accomplishment, challenge and winning.

The problem of engaging students in their education has existed for a long time. One way of increasing engagement in the educational context is Gamification. The book *Gamification in Learning and Education* by Kim, Song, Lockee & Burton, focuses on the effect gamification can have over the students' learning motivation and the features and processes that a good educational game design should contain. According to the authors, the description of Gamification in learning and education is as following:

*"Gamification in learning and education is a set of activities and processes to solve problems related to learning and education by using or applying the game mechanics."*  
(Poole, Kemp, Patterson & Williams, 2014)

To get a clear understanding of how Gamification could be used in education, Gamification frameworks were explored.

## MDA framework

The MDA (Hunicke, LeBlanc and Zubek, 2004) framework stands for Mechanics, Dynamics and Aesthetics. The framework focuses on understanding the gap between game design and game development, and overcome it. The Mechanics of the MDA refer to the components within the game. This provides a guideline of the allowed behaviour of the player. Dynamics focus on the interaction created between the player and the Mechanics - what actions will they take. Aesthetics is the experience, feelings and emotions the players feel during a game. This is an important part of the framework, as the emotional state is what the whole frameworks aims at and requires as a final result.

## Werbach and Hunter framework

The Werbach and Hunter (2012) framework is divided into 3 different parts: dynamics, mechanics and components. Dynamics is the main part of the system - it is the end goal or mission of the game. The mechanics are the elements that keep the players interested, keep a specific behaviour and evoke interaction. Components are the different types of rewards and achievements the players are presented with.

## Bunchball framework

As Lix is an already established application where gamification aims at adding value, rather than building the entire service on gamification, Bunchball (2016) framework will be taken into consideration. It is a simple framework divided into two parts: dynamics and mechanics. The dynamics gamification element regards the experience the user receives, as statuses, achievements, awards and competition. The mechanics of the framework represent the elements that drive the games to be engaged in the product. Such mechanics are points, challenges, gifts, levels and leaderboards.



## 2.1.1 Educational Gamification Guide

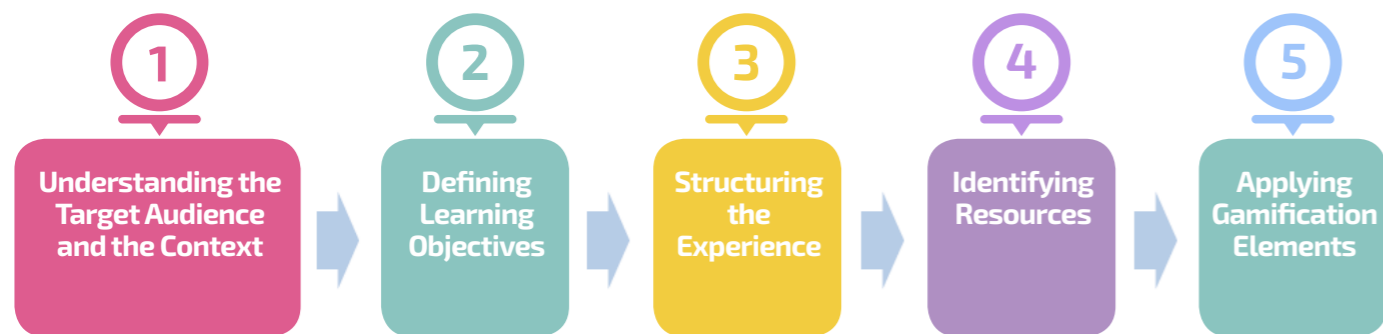
As a reference on how to successfully implement Gamification into the educational context the following guide was utilized to give the design solution a clear structure of development. Although Gamification is a simple concept, implementing it successfully into any area, especially educational, may be a challenge. Therefore, the structure of Huang and Soman (2013) for creating a successful Gamification within education, would be used as a guide throughout the thesis. ( see Figure 5a).

The process is divided into five simple steps. The first step is to understand who is the target audience and the context in which gamification is used. To gather that knowledge means to get an in-depth understanding of the students, their needs and frustrations. A target group analysis may provide insights, but in order to acquire better knowledge of the context surrounding the students, there should be analysis of their environments, skills, needs and frustrations. This requires a better overview of the students pain points that prevent them to advance and be on top of their studies. Gaining more knowledge about these pain points can help determine the necessary gamification elements that are required for the feature design.

The second step is to define the learning objectives of the game and what is the end goal the student should complete. This could be an array of objectives, like completing an assignment, performing well on an exam or complete a project.

The third step is structuring the experience - a breakdown of all the milestones and steps and the pain points it resolves. The stages and milestones allow gathering knowledge of the needs of the students, breaking them down into smaller steps that could easily be achieved. This allows a better overview of the process , how much has to be completed and seem more achievable and measurable for the students. This also can improve motivation, as when completing specific stages or milestones, students do not get bored, on the contrary - completing small achievements makes them more motivated and eager to keep up the good work.

Figure 5a: Five step gamification guide



The next step represents the necessary resources that would be needed for a successful Gamification. This will allow to determine whenever each stage or element could be gamified. The following Figure 5b will be used to help identify the necessary Gamification elements that could help provide value for the students.

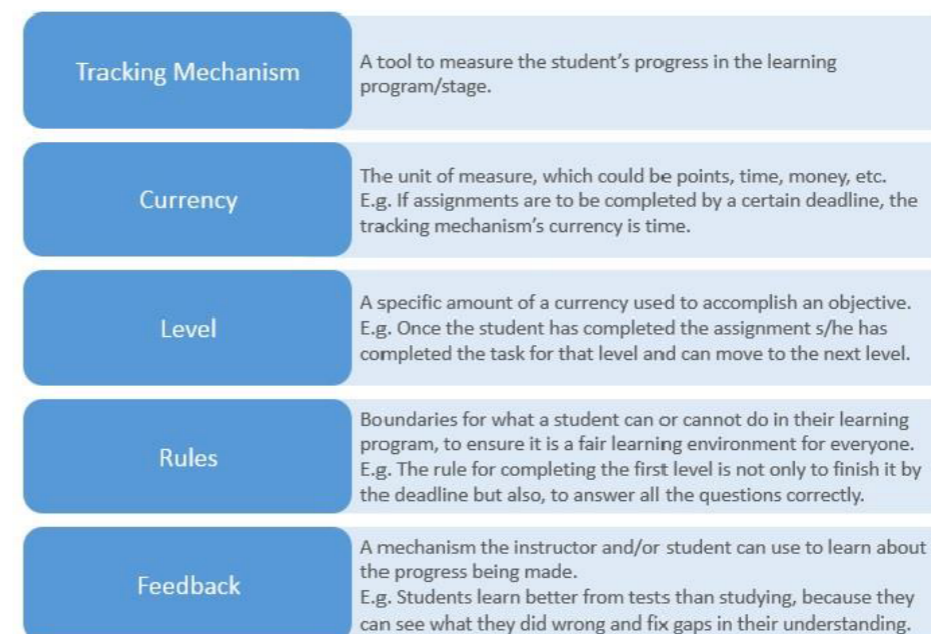


Figure 5b: Gamification Resources

The last step within the Gamification guideline is the actual application of Gamification elements. This represents the specific game mechanics that could be applied to the learning platform. They are divided into two classes: self-elements and social elements.

Self-elements are badges, levels, point or time restrictions, that provide the students with a way to be more engaged with the platform and compete with themselves. Social-elements represent the mechanics that allow students to compete with each other or simply work with others, where they can see their progress publicly. Table 2 gives an example of some of the mechanics related with each of the elements.

It is important to consider how each element is used, as it could trigger different specific reactions within the students. Used properly, the gamification elements can provide value to the students, but if used in an incorrect way, they can ruin the experience and decrease the motivation to complete a task or continue with their tasks. Therefore, it is very important to ensure that the students motivation is continuing throughout each stage and they are eager to progress.

In order to create a successful Gamification in the Lix platform, this Gamification guide will be applied in the process of creating the Lix feature and will be referred to in later stages of the report. Each stage will be marked with a number on the side of the page, visualizing the step in which the insight supporting it belongs throughout the Gamification process.

Table 2: Game Mechanics

Examples of Game Mechanics (Self-Elements vs. Social Elements)	
Self-Elements (Complete Stage)	Social Elements (Push Stage)
Points	Leaderboards
Levels	Virtual Goods
Trophies/Badges	Interactive Cooperation
Virtual Goods	Storyline
Storyline	
Time Restrictions	
Aesthetics	

## 2.1.2 Gamification Examples: Cases within Education.

In order to get a better overview of Gamification within the educational area, I will focus on researching applications and programs that use games within their solutions. The chosen programs will provide solutions of one (or more) of the five main students' pain points.

### GOCONQR

GoConqr (see Figure 6a) is an application that helps students excel further with their education. It provides additional knowledge and extra courses on many subjects, including the Business and Economy area. In addition, it provides a social interaction with other students and the ability to create your own community. By providing additional learning resources, it is a helpful tool that students can use as a way to get a better understanding of their content.

The tool contains a calendar and a study planner, which allows the user to organize their time and tasks. In addition, it provides a way to organize the content and visualize the knowledge into mind maps and other visuals. The tool provides an analytics dashboard that help track the students progress. This gamification element stimulates motivation and provides the users with a more comprehensive overview of what they are achieved. Self created quizzes allow a more gamified way to test your knowledge and learn additionally while having fun.

Figure 6a: GOConqr



### QUIZLET

Quizlet provides a gamified tool to help users study and memorize their content better. The quizzes can be both personal or used in collaboration with others. The structure of the application is based on different levels of difficulty and a track of their progress. The application (see Figure 6b) allows to set a reminder to motivate the students to keep up with their tasks and workload. The main Gamification element is the score students receive at the end of the quiz, which could motivate them to learn more or keep up the good work. In addition, the students could compete against others and see their place in a leaderboard. This creates a peer pressure that some students may consider as a motivation to achieve better results and higher level of knowledge.

### UDEMY

Udemy is a gamified educational application that allows the student to access additional video courses and knowledge. The program helps motivation by visualizing a progress bar for the students to see their advancement in the course (see Figure 6c). In addition, each completed course is rewarded with a trophy to enhance the feeling of pride and achievement. Another gamified element is the quizzes provided for each course, helping the students test and confirm their knowledge.

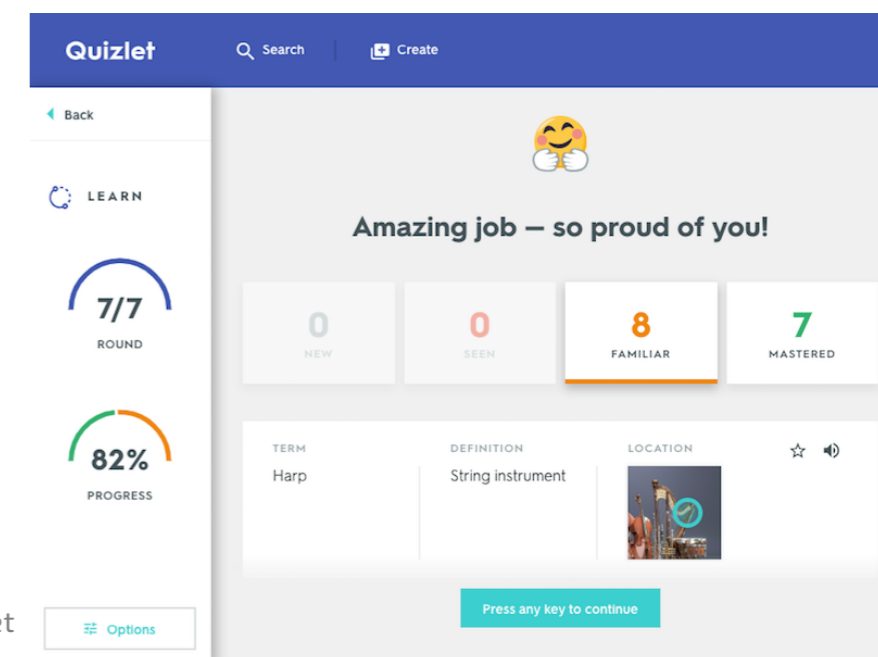


Figure 6b: Quizlet

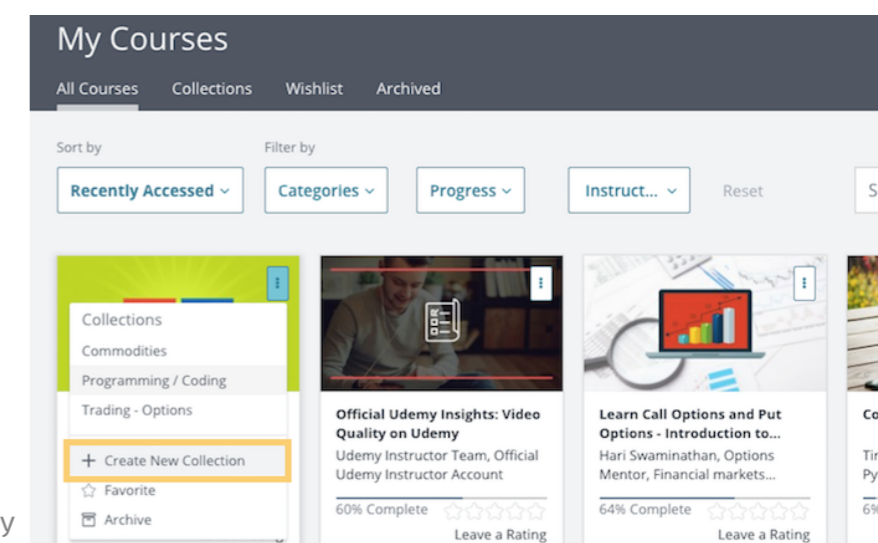


Figure 6c: Udemy

## DUOLINGO

Although Duolingo (Figure 6d) is not an application that solves any of the previously mentioned problems on its own, it is a successful program that incorporated a gamified solutions for students trying to learn new languages. Therefore, there will be a specific focus on how they resolve the same issues throughout their program. Duolingo owns its success to the highly gamified and fun way of teaching languages. This engages the users and motivates them to continue their work. The most successful gamification elements used by the application are the progress Heads-Up Displays and the access items / bottlenecks. The first element allows the users to see their progress and getting a continuous feedback on their work. Accessing items and bottlenecks provides the students to customize their learning style, so it fits them better. They can skip levels whenever their knowledge matches the requirements or be able to access higher levels of knowledge only whenever they have completed the previous level. Duolingo provides badges to motivate students and create an easy overview of their achievements.

All four applications are using gamification in order to motivate the students to enjoy studying. Creating a more fun way to learn and visualizing the progress proves to be helpful and fulfilling for the students. Even if another pain point is chosen for the main solution for the Lix additional feature, implementation of gamification elements would also solve the motivation problems many students encounter. The research into the previously mentioned applications would be used as an inspiration of how to implement gamification within Lix.

Figure 6d: Duolingo



## 2.2 Target audience



As this thesis is focusing on creating a gamified feature for the Lix app, the Gamification guide introduced in Section 2.1.1 will be used along the project. The first step the guide introduces is the understanding of the Target audience and the context. Gathering this knowledge will allow a better understanding of the students and the context in which they may use the gamified feature. Therefore, the next sections will focus on gathering more information about Lix Technology's target group.

### 2.2.1 TARGET GROUP

Lix Technologies has a very well defined target group: University students. The typical age of students may vary between 18 and 27 years old, depending on their level of education. In Lix Technologies case, their subscription is focused on Bachelor students, especially undertaking education in the Business and Economics field. Taking into consideration the age group, it is fair to say that Lix Technologies target group is Generation Y, people born between 1981 and 2001 (Black, 2010). The majority of the current Lix subscription cases are aimed at Danish Universities and that will be a big part of their future target group, so we will focus on students in Denmark (both Danish and international students). The target group this project will engage is the Lix subscription users in particular.

In order to better understand the target group and their behaviour and habits, the following section will focus on Generation Y and their attitude towards education.



### 2.2.2 GENERATION Y

Generation Y, or also known as the Millennials, are designated as "digital natives" (Black, 2010) and are very dependent on technology. According to Alison Black (2010), this generation is also known for their "everyone gets a trophy" kind of attitude and a need of being rewarded for every achievement they have accomplished. They use technology on a daily basis, have grown with it and are fluent in "digital language" (Alison Black, 2010).

The way Generation Y studies always involves technology. They prefer to see visuals rather than texts. According to Black (2010), this generation of students thinks and processes information in a different way than the past generations - they do not have the patience to stay through a lecture or stare at a book for too long. Due to their involvement with technology, they are bored with traditional methods of teaching and process better images with the least amount of text included. Therefore generation Y requires constant stimulation and challenges, in order to keep them engaged in their studies.

An article by Poole, Kemp, Patterson & Williams (2014) focuses on solving the major challenge in the American education - motivating and engaging Generation Y in regards to their studies. According to the article, Generation Y students are looking for engaging, flexible and interactive learning processes. They are driven by the belief that they should always win something as a result of their efforts and hard work.

Therefore Poole, Kemp, Patterson & Williams suggest that Gamification can improve and engage digital natives in their education, as well as increasing their activity. In order to prove that claim, a study was carried out, where one class was exposed to Gamification, while another was not. The class that had Gamification implemented into their studies performed better on their assignment. This result concluded that gamification could improve the students' learning experience, specifically their reading experience, as they suggested that incorporating Gamification in relation to reading could result in more effective and engaged students.



## 2.3 Defining the learning objectives

The following section will explore further the pain points the students encounter during their studying process. This will continue the first stage of understanding the target audience (Gamification guide), as well as take the research into the second stage: Defining the learning objectives. This will help get an overview of the students goal during their education and what they strive to achieve during their time at University.

### 2.3.1 CUSTOMERS INSIGHT

Although the target group was already identified, further research in the form of interviews were conducted, in order to get a better understanding of the students and their needs. The aim of the interviews was to support and further explore the information gathered throughout the Lix survey.

The interviews were conducted online, using an online meeting platform appear.in, so the students can do it from the comfort of their own homes and at a time that is comfortable for them, while at the same time the face-to-face interaction is not lost, making communication more open and comfortable.

In order to be able to collect the student's insights and reveal their pains, needs and expectations, an interview guide was created (Appendix 2). Although there was a guide, the interviews were semi-structured, in order to allow additional or follow-up questions to be asked, while at the same time receiving answers that are easy to measure and analyze. This would help us explore specific areas or any specific needs the students have. The aim of the interviews was to determine how the students feel and what they need, rather than get all questions answered. The analysis of the interviews would help create a solution that would help Lix users with overcoming any pains they encounter during studying.

The interview was conducted with 18 students from different education, most of which were within the Business and Economics education. Although the students were Lix users, they were not subscription cases, as the subscription was relatively new. Therefore, the interviewees were users of Lix that have purchased their books on their own. Nevertheless, the needs, expectations and problems they encounter should not be affected by that.

The interviews focused on efficient studying and motivation, as well as the most common pains students have during their education. As the interview contained open-ended questions, the students had very different answers and insights to share (see Appendix 3). Nevertheless, there was an emerging pattern in their answers.



The insights collected through the interviews would be used while creating the personas and the current Lix journey map.

# Customers

# Insight

#### Customer Insight

*The majority of the students are visual type of learners, as the best way for them to learn and remember was by seeing graphical representations of the content.*

#### Customer Insight

*The most important motivation was the quality of the education (books, lectures, teachers), as well as it being their fear. Students get discouraged, if the content or education is not engaging.*

#### Customer Insight

*Students are guided by their extrinsic motivation to achieve a goal, assignment or finish their education and find a relevant job. Their biggest success is passing exams and getting good grades, instead of being satisfied solely to learn.*

## Customer Insight

*The biggest worry students have is related to managing their time and workload, which results in a challenge to keep up with their materials.*

## Customer Insight

*Students struggle with understanding the content and are worried that this might affect their ability to follow the course.*

## Customer Insight

*Students would enjoy their studies more if they had the ability to organize, plan better and have everything together and accessible.*

## Customer Insight

*Some students would be more motivated and engaged in their studies if they were provided with challenges or contests, as well as a reward system that would provide them with validation of their work and how well they are performing.*

## 2.3.2 PERSONAS:

To create a more tangible and visual insight of the user research and the data gathered throughout the interviews, personas were created. This will allow for a better understanding of who the customers are and who is Lix creating for. The personas that were created are role-based personas (Nielsen, 2013), focusing on the behaviour while trying to reach their goal. Their behaviour would provide information regarding how the project could be approached and what solution could work for the users.

Based on the Generation Y characteristics and the interviews with the students, three personas with similar pains, needs and expectations were created. Each persona was representing a different level of performance drive of the students, with a specific behaviour common with their attitude towards studying. Each student is using Lix in their education. The Star (A-grade) student ( Figure 7a) represents the overachieving students, that strive for perfection. They like to be structured and efficient, learn as much as possible and expand their knowledge at any given opportunity.

The middle effort student persona - the Striver (Figure 7b) is illustrating most of the students in higher education - striving to do good while balancing work and social life. Their goals through their education is to get good grades, but can accept and confess that they may not be on top of their workload at all times.

Lastly there is the Slacker persona (Figure 7c) - it represents those students that occasionally show at class, unprepared and somehow still manage to pass their exams. Those students focus more on their personal and social life, rather than their education. They still get enough knowledge to understand their subjects and pass their exams but do not prioritize education as their most important mission in life.

The personas focus on the different types of students and their ways of using Lix, reflecting on their habits, frustrations and motivators. Although all types are users of the application, Lix has decided to use the Striver as their main persona and inspiration to design for (figure 8). The reason for this choice is the fact that there is a bigger percentage of interviewed students fit into the Striver persona, rather than the Star student and the Slacker. In addition, the Strivers behaviour at times could fit the other personas as well. Therefore, the Striver will be used as the main persona in many occasions throughout this report.

After defining the target group ( section 2.2), the customer insight, the personas provided additional information regarding the pains the students encounter. As specified by the company and based on the student research, the Lix customers have the same issues as any other student has. No matter the education, the semester or the way the students study, they all have the same pain points: Lack of motivation, poor time management, overwhelming workload and lack of organization. These are the most common pain points between the Lix target group.

In addition, the research done with the customers and the creation of the relevant personas defined the learning objectives the students are aiming at. They consider passing assignments, doing projects and reading their content a small objective that is achieved during their semester. Their main overall objective is to pass all of their exams, get good grades, finish their education and find a relevant job in their field. As a result of this insight, a specific objective has been selected, in order to help the following steps of the gamification process. The objective that the Lix feature will focus on is "Students must gain the required knowledge to pass their exams and perform above average."

Figure 8: Lix Main Market





# Star

# Student

Figure 7a: Star student persona

**Margo**  
22, Aarhus  
A-grade student

**PERSONALITY**

- Determined
- Organised
- Efficient
- Perfectionist
- Overachiever

**Who is she?**

- She lives with her parents and studies extra on the weekends
- She is very organised and dedicates her time for studying in the most efficient way possible
- She is always updated with her general studies and spends her extra time reading additionally and doing extra work

**Behaviour**

- She uses Lix because she has access to all the books, she can highlight and write notes directly into them.
- She is aware of their abilities and best personal practices for studying and learning
- She likes to schedule her time and make deadlines, in order to always be prepared and in sync with the lectures
- She uses digital tools that could help be more efficient and save as much time as possible
- Extra time is of great value, as she could use it to read additional materials.
- She organises her study materials and needs to be in control of her time

**Goals**

- She wants to be prepared and stand out, because that means she will have a brighter future
- She wants to read through all her books and find additional content that will help her stand out
- She aims for the highest grades because that will be a reflection of her knowledge and hard work

**Motivators**

- Having all the materials available and on hand predisposes her to get into study mode
- She always reads before class so she can understand everything and is prepared to answer any questions
- She is always prepared and ready to learn, so she can give the best impression and receive the best grades.

**INCOME**  
Medium

**EDUCATION LEVEL:**  
Bachelor in Economics and Management

*"To succeed it is necessary to only focus on the most important things"*

**Studying habits**

- Never lends books
- Reads through all textbooks even when it is not mandatory
- Marks all exams and assignments in her calendar
- Tracks her reading progress
- Makes folders and subfolders for all her subjects
- Colour-codes her highlights
- Creates her own "study book" from books, lectures and notes.

**Frustrations**

- Bad grades
- Distractions
- Lack of organisation
- Demotivating lectures

**Frequently used apps**

Lix, Google Calendar, Monday.com



# Striver

# Student

Figure 7b: The Striver student persona

**Julius**  
24, Copenhagen  
Middle effort student

**INCOME**  
Low

**EDUCATION LEVEL:**  
Bachelor in International Business Communication

**PERSONALITY**

- Procrastinator
- Social
- Unassertive
- Technology oriented
- Skeptical

**Who is he?**

- He shares an apartment with friends
- He has a weekend job in a cafe.
- He is normally very busy to be up to date with his classes.
- He looks for getting the best learning out of his studies.

**Behaviour**

- Starts the semester strong but loses motivation soon after
- Uses Lix as it saves money and provides him with all the necessary content everywhere, at any time.
- Read whenever he can, but usually struggle with being prepared for every class.
- Due to the study load, work and social life, he struggles to find time to read, so he tries to catch up while traveling or late at night.
- If he struggles with understanding the content, he reaches to his classmates help
- Likes to learn as much as possible from the lectures and his personal notes, rather than reading through the books

**Goals**

- He's main goal is to pass his exams
- He focuses more on gaining knowledge, rather than grades
- He wants to be able to be on top of the semester courses and prevent slacking on his reading
- His main focus is to make studying easier and efficient
- He always tries to improve his time management skills and be more organised

**Motivators**

- Enjoys studying with his classmates rather than sitting at home reading
- Feels a sense of achievement when he manages to read the required content for his lectures.
- If he keeps up with his reading, he will enjoy his free time more
- Deadlines like exams and assignments motivate him to start studying

*"I like to support my own learning process with my classmates and teacher."*

**Studying habits**

- Tries to read at work, whenever he has a slow shift
- Reads through the most important chapters in his books
- Keeps all his notes and content in the same document/folder
- Calculates the amount of pages he needs to read and if there is any time to do it
- Crams all the content few weeks before an examination

**Frustrations**

- Wasting time on irrelevant content
- Inability to manage workload
- Useless study apps

**Frequently used apps**

Lix, Word, Dropbox



# Slacker

# Student



Figure 7c: The Slacker student persona

**Personality**

- Outgoing
- Leisurely
- Optimistic
- Confident
- Imaginative

**Who is she?**

- She moved from Hungary to study her higher education in Denmark
- She lives in a student accommodation and is supported by there family
- She has done well throughout her high school education without putting a lot of effort

“Why do something if it dull and doesn't make us happy”

**Behaviour**

- She is finally independent and on her own and wants to experience the world as much as possible
- She uses Lix because everybody else is using it and it's a simple way to have the necessary content
- She believes that even if unprepared on examinations, she may pull it of enough to pass
- She knows that after graduating she will have to find a job, so she wants to have fun during her study years

**Studying habits**

- She likes to read through the teachers slides so she can learn the most important
- She watches video in order to learn the most important knowledge
- She searches for the specific content and read its definitions
- She understands the examples of how a theory is used - that gives her a better understanding.

**Goals**

- Her goal is to graduate, so she can find a good job in the future
- She wants to meet as many people as she can and expand her network
- Her aim is to learn as much as possible without wasting her time on anything irrelevant.
- She wants to know how to use her knowledge in real life situations


**Motivators**


- The idea of a good job after graduation motivates her to prepare
- Spending time with other students can be both fun and educational
- Being a valuable part of group work and contributing make her feel proud of herself


**Frustrations**

- Having assignments that require studying in the weekend
- Reading exceeding the time she planned for it
- Lack of visuals

**Frequently used apps**

  
Lix

  
Facebook

  
Youtube



## 2.4 Structuring the experience

The aim of the third stage of the Gamification Guide is to break down the students process during their education and to find the position of the painpoin during that process. Stages and milestones will be defined with the help of the Current Lix Journey, a Storyboard and the Value Constellation.

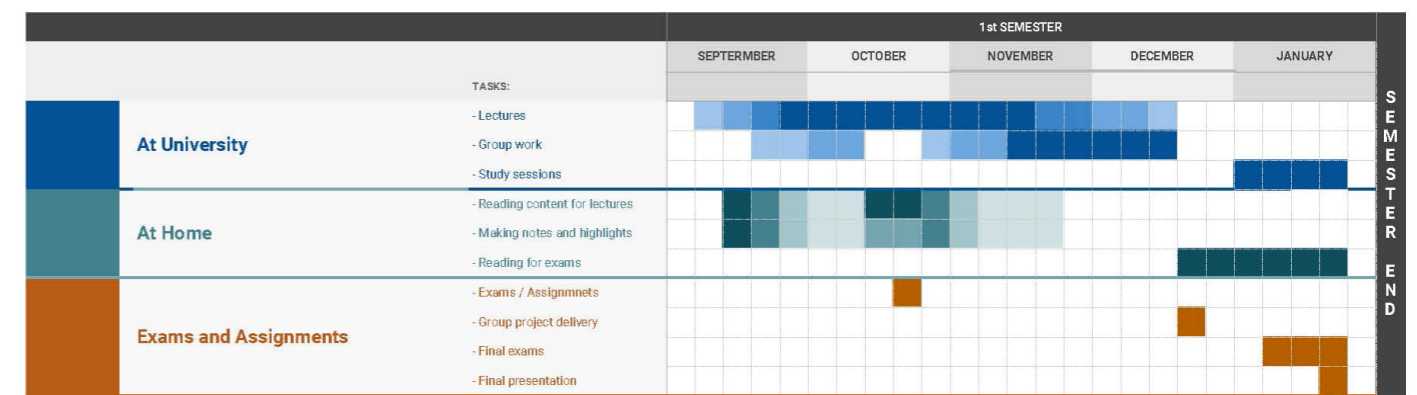
### 2.4.1 CURRENT CUSTOMER JOURNEY

This customer journey ( see Figure 9) will focus on the current process of how students study during their semester using the Lix application. It is based on the data collected throughout the students research and customer interviews, as well as the Striver persona and their behaviour during their studies. The aim of the customer journey is to show an overview of the study process and how the students pain reflect on their studies.

The journey is based on one semester and has been divided into 3 parts: At Home and At University and Exams. The reason behind that decision is the fact that studying does not only limit itself to the classroom, but also requires additional work at home. The different processes are illustrated with a different shade of a colour to present the intensity and time spent into the action.

In order to visualize the journey and represent the information required, the journey has been visualized as a Gantt chart, representing the students workload, intensity and experience.

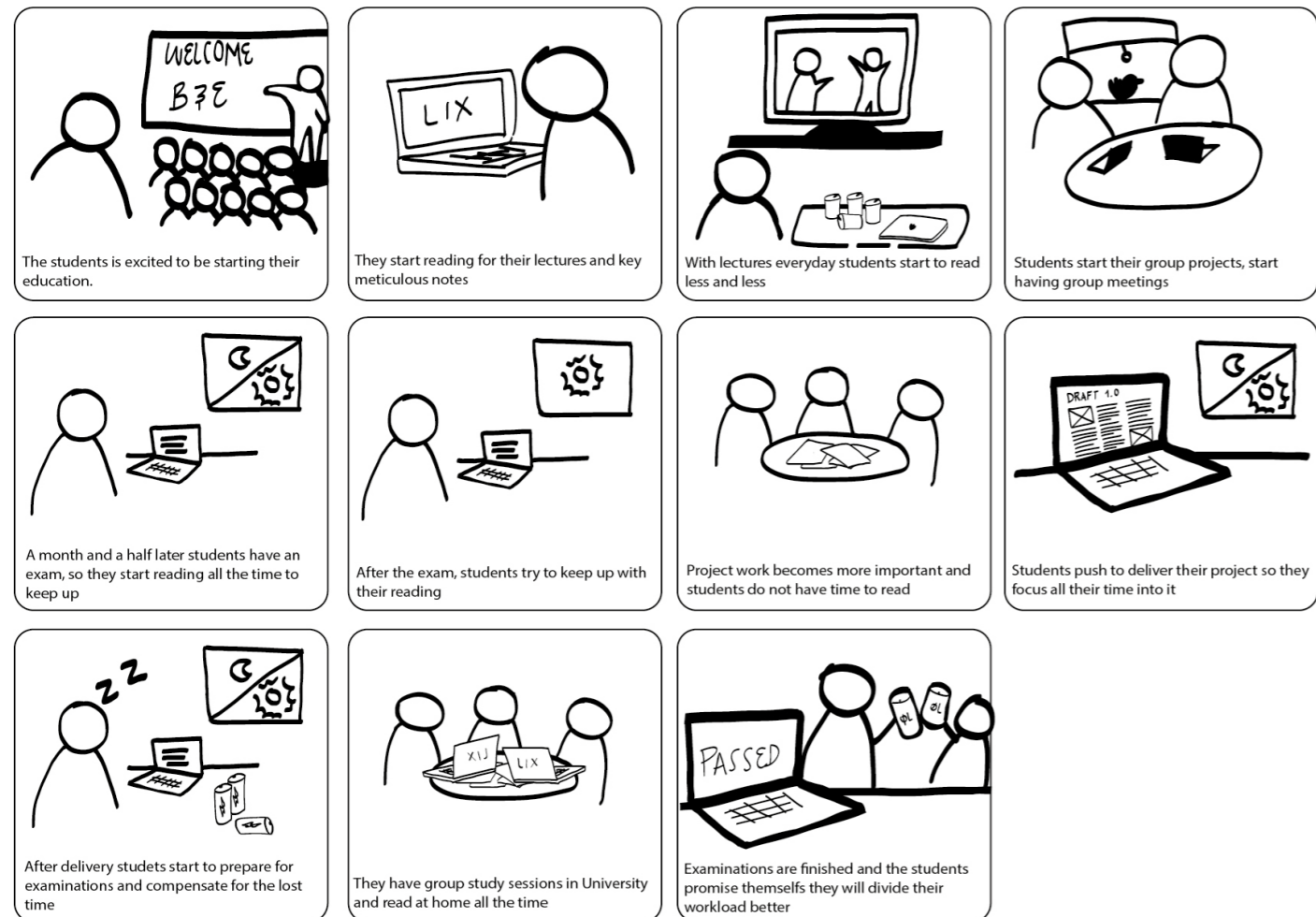
The journey focuses on the students inability to study efficient and keep up with their lectures and study tasks. Many students start out strong and are excited to read, make notes and highlights and do their best, but soon they cannot keep up and get distracted by other study related tasks. This results in them being overloaded during exam periods, feeling stressed and nervous.





### 2.4.2 STORYBOARD

In order to portray the issues and problems students have during their semester, I have created a Storyboard ( see Figure 10) that will support the Student journey. It represents the emotional impact the Student journey has on the users and how each stage is represented in their everyday life. This will help visualize the existing problems and help create a better understanding of the students needs and expectations towards their study life.



### 2.4.3 VALUE CONSTELLATION

Lix goal is to create a "digital study tool" that provides value for the students and becomes the solution to their everyday study related problems. Therefore, it is important to create a value constellation, so that the company can get a better overview of the current value they present to the students. This requires an understanding of the offerings the Lix platform presents to the students and what value do they bring to the customer.

Figure 11 visualizes the current Lix value constellation. The model focuses on the main value the current Lix application brings to the students. It is divided in four different values: content accessibility, affordability, content understanding and efficiency. Each of the values is supported with one or more features within the Lix platform that provides the specific value for the customer. Some of the tools provide more than one value, as when used, they provide a solution towards more than one problem.

**Figure 11:** Current Value Constellation







## 2.5 Research Area

The *Structuring the experience* stage provided an overview of the milestones the students have to complete during their semester, in order to achieve their objective. Unfortunately, the current process is very chaotic and the different milestones are not easy to define by the students. According to the Current Student Journey, even with the value Lix provides, students are struggling with identifying the necessary steps to be efficient students and be on top of their studies. This proves that their milestones are not measurable and are hard for them to achieve. The students are struggling to read the required content due to the pain points discovered in the previous stage. Therefore, in order to structure the study experience, the pain points should be narrowed down to allow a better focus on specific offering, how it can be developed to provide value to the service and how it could easily be broken down into more measurable and achievable stages.

Taking into consideration the Define phase and all the research conducted throughout it, it was possible to narrow down the research area of the project. Throughout the research and the define phase, the age group of the target group was defined as students between the ages of 18- 27 years old. In addition, the Lix's survey and findings gave a clear overview of the student's needs and expectation from their education. The new generation of students have different outlook and expectations from their studies, as well as different means of motivation.

Their mindset is very focused on digital services and they are very dependant on their devices. They always search for a digital solution to their problems and are always seeking a reward for their achievements. In light of this, I chose to investigate the effect and difference Gamification can provide to the students. My focus would be on the use of gamification in the educational area, and in particular Lix, so that it could support the product, improve the students experience and engage them in their study activities.

The research lead to the following research question:



How could gamification support the service experience when meeting the customers needs and expectations?



# 3. Develop

..... 1	Co-creation Workshop
..... 2	Co-design workshop
..... 3	Prototyping process
..... 4	Alignment presentation
..... 5	Service Concept
..... 6	Reflections



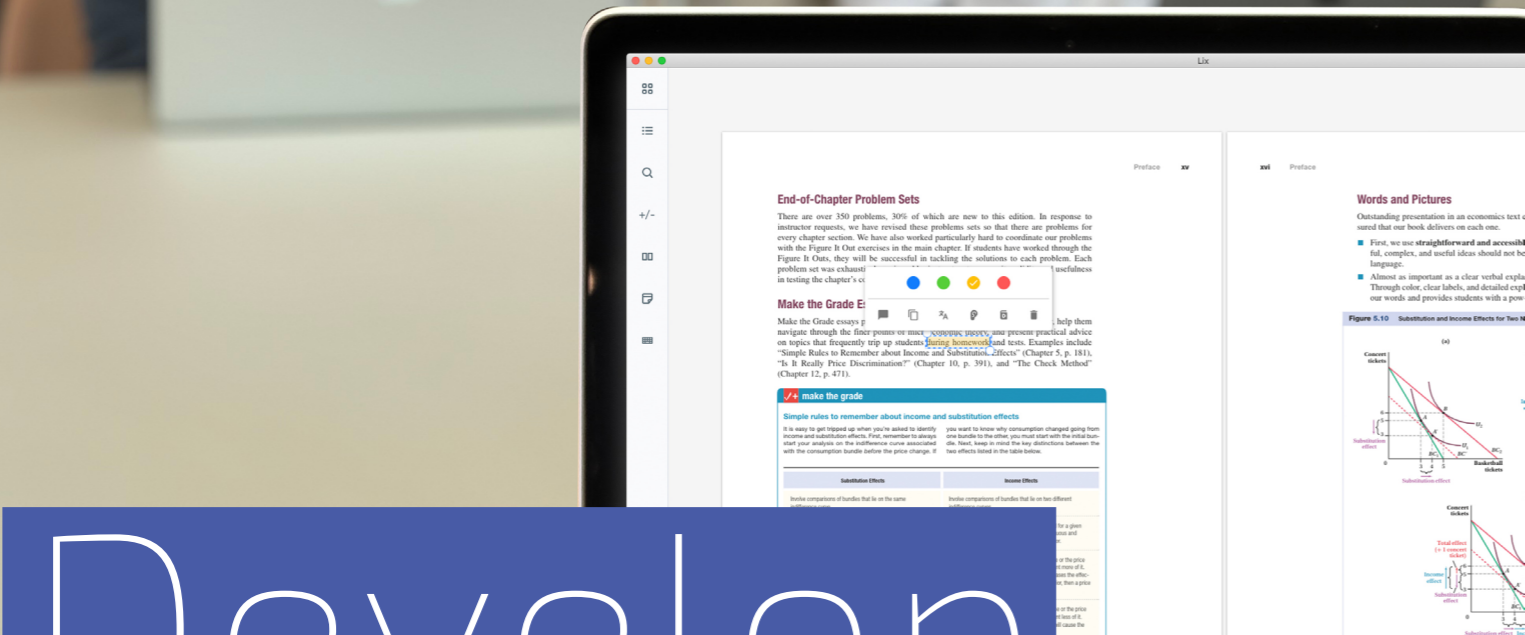
# Workshops

Workshops are a great tool to gather people together and collaborate on a specific task (Reason, Løvlie & Flu, 2015). The aim of a workshop is to gather a better understanding of the customer, their pains and needs, seeing through their eyes. This gives a better overview of the problems the customer encounters and how it could possibly be solved. Having this knowledge in mind, the participants in the workshop should focus on collaborating over the possible solutions and create a concept that would help improve the users' experience. The final stage is to ideate on possible implementations, how would the concept work and who should be involved in the process.

Within this project, the main focus will be using Co-creation workshops in order to gather even more thorough knowledge of the customers' needs, pains and expectations (Sanders & Stappers, 2008). Co-creation requires the involvement of the customers, in order to gain a better overview as well as to explore their ideas of how to solve the problem at hand.

The Co-creation method would be used through the students workshop, where they will be collaborating and ideating on creating a solution that would provide additional value to the Lix application. They would focus on the problems the students face during their studies, narrowing them down and creating a solution that would feed the specific needs.

The Co-design workshop will involve the development team at Lix and evaluate the results from the Co-creation workshop. This will allow to narrow down the students ideas, making them more feasible and possible to execute.



# Develop phase

This phase will focus on the service and the process required for its development. After the main problems students encounter during their education have been established, the Develop phase will focus on narrowing the pains and creating a solution that will help the students during their studies.

### 3.1. CO-CREATION WORKSHOP

In order to get a better understanding of the students and their needs and expectations, a co-create workshop was conducted. The aim of the workshop was to align their expectations of the Lix product and help create a product that provides value for the students. Therefore the workshop was focus on co-creating an additional service into the Lix application, that would contribute into solving their pains and meet their expectations of a study related application. The workshop was conducted with a small group ( seven students ) from different areas of the Business and Economics field. All the students were ether still undergoing their education, or have graduated in the last few months. The purpose of this was to gather students that have recently been involved into the everyday student life and have experienced specific struggles or achievements. This would allow them to express their opinion, align their struggles and hopes for the future of studying. The workshop took around two hours and was divided into small individual tasks and group exercises that provided the participants time to reflect on their own experiences and working together as a group, co-creating a solution to the most common struggles during their studies.



Figure 12a: Workshop: First stage

#### 3.1.1 WORKSHOP STAGES

The workshop was divided into and introduction and four stages. The introduction stage introduced the product, the goal of the workshop and the expectations from each of the students. In addition, students were encouraged to speak up and ask for assistance or help if needed. This stage lasted 10 minutes, where the students had the opportunity to talk and get to know each other over snacks and drinks. This allowed for a more comfortable environment where the participants can feel free to express their opinion.

The first stage of the workshop focused on the student's personal experiences and pains during their educations. This stage was selected as the first and most important one, because it was creating the foundation of the workshop - it allowed the students to reflect on their own experience. The students had 10 minutes to do an individual card sorting (see Appendix 4) where they were presented the top 5 most common students pains, which were selected based on the student research and customer insights. The participants had to prioritize the cards from the most challenging problems to the least (see Figure 12a).



Figure 12b: Workshop: Second stage

The second part of the workshop was a follow up of the individual task. The students were grouped into two teams (see figure 12b). Each team had to discuss and evaluate the order of their cards and create a new arrangement, while working together. This allowed them to vocalize their opinions, share their experience and provide the other participants with additional insight on their pains. As a result, the participants had to have a discussion to decide how to generalize their priorities and create a list that reflects their experience and opinions the most. The students had 15 minutes to complete the task.

The third stage was to co-create a solution that could be implemented into Lix and simultaneously solve the two groups issues. As they already had been talking over their pain points and have created a common order of the most important problems they encountered, they had already laid the ground for their solution. The students had 45 minutes to complete the stage. The method used within this stage was the one page, many pens workshop techniques (Stickdorn, Lawrence, Hormess, & Schneider, 2018) It allows the participants to collaborate on the same document. This provides them with time to discuss and contribute to the concept they are creating, rather than just drawing whatever comes first into their minds. That isures a discussion and a co-creative process would be used. In addition, the participants were introduced to the concept of Sh!tty first drafts (Stickdorn, Lawrence, Hormess, & Schneider, 2018). The idea behind this concept is to break the common misconception th at their ideas need to be perfect and final. The draft should be low-fidelity and the participants do not need to focus on the perfect execution, rather spend their time on ideating their solution. This is also the reason why the Lix application visual was presented as a hand drawn low-fidelity drawing, rather than an actual picture of the existing application.

Each group was given a paper prototype of the Lix reading application ( see Figure 12c). Their task was to create a solution that could be implemented into the application and at the same time solve the top pain they already have chosen in the previous stage. They were allowed to draw in the prototype and create new tools and features.

The final stage was focused on Gamification. As they already had created their solution toward their main pain points, they were required to think about gamification in the context of their idea. The participants had 30 minutes to think about how they can improve or involve game mechanics into their new Lix application ( see Figure 12d). Their main task was to decide if there was any Gamification, that could support the new features they created and make the reading experience more enjoyable.



Figure 12c: Workshop: Third stage

Figure 12d: Workshop: Fourth stage



### 3.1.2 OUTCOME

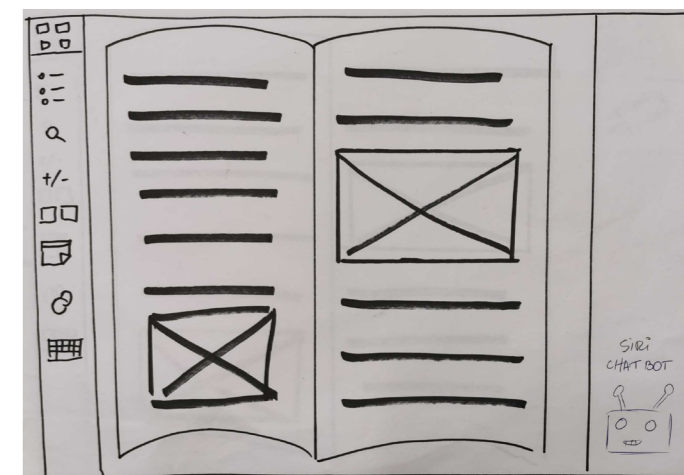
As the students were allowed to start working individually, they had the opportunity to express their personal opinion and set the tone of the workshop. They felt it was an easy task to sort their card as they all had different struggles during their education. The outcome of this stage was a very diverse set of prioritization. This results were the focal point of the next stage, as the participants were divided into two groups (one of four participants and one containing three). Each group had to use their own vision of the pains, in order to decide on their most important issues. The participants had a discussion regarding their choices and the reason why they think that is a student pain. As a result, the groups re-ordered their cards to show a general agreement of the pains involved in their education process. The results of this stage are enlisted in Table 3.

**Table 3:** Group cardsorting outcome

Group 1	Group 2
1. Motivation	1. Motivation
2. Content understanding	2. Time & task management
3. Organization	3. Workload
4. Workload	4. Organization
5. Time & task management	5. Content understanding

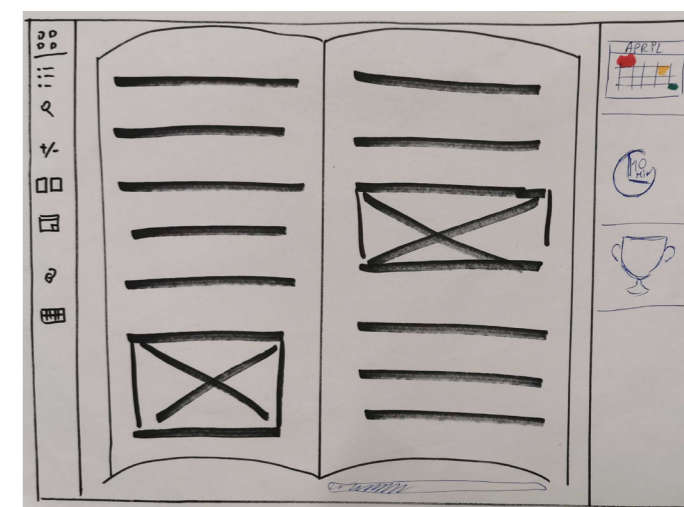
In the third stage of the workshop the groups were asked to solve their top pain as a new feature in the Lix application. As both groups have chosen Motivation as their number one pain, they had the same starting point. Throughout their discussion and ideation, they soon realized that in order to solve the motivation issues, they were trying to solve their second choice of the pain points. This resulted into the two groups focusing on Content understanding and Time and Task Management respectively.

The first group created a Responsive PA (personal assistant) that could organize their reading and summarize it into easier to understand content (see figure 13a). This was going to allow the reading process to be smoother and faster. They drew inspiration from Siri, creating a more education focused version of it. Their idea focused on creating a tool that could be used as a chat bot, providing extra content summarizing big bulks of information and allowing additional help when needed or asked for. The PA could be interacted on the side of the Lix application and when clicked, it would provide space to enter the problem the students needs assistance with.



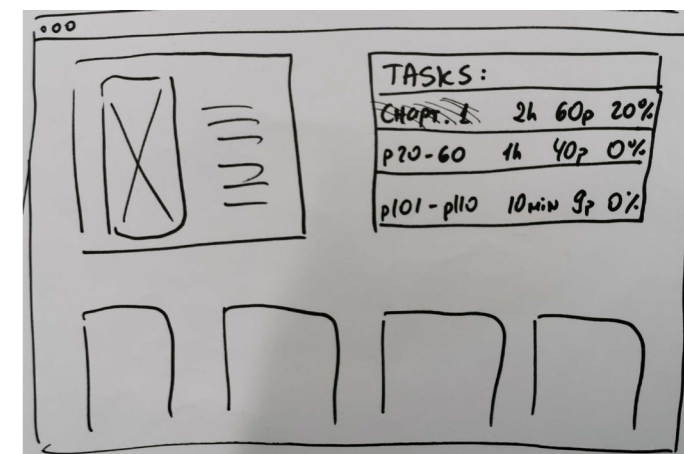
**Figure 13a:** Group 1 Solution: Responsive PA

The second group had a very simple solution to their time management problem - a feature that would allow them to divide their reading and receive an estimate time to complete that section. The students wanted to have a time/clock icon, showing their progress while reading and keeping track of the time left while they are progressing in the book. In addition they wanted to incorporate a reward system as points or badges they could receive when completing a task and reaching a level at certain points. Within this solution (see Figure 13b), they already had touched upon gamification in relation to the countdown, reward and level game mechanics.



**Figure 13b:** Group 2 Solution: Time to read

The final stage was focused purely on the gamification factor and how it could be incorporated into their solutions. The groups were encouraged to take gamification into consideration and see how and if it could become a part of their new Lix feature. The first group decided that using gamification wouldn't provide any value to their feature. Therefore they were provided different gamification mechanics that they could try to incorporate. Nevertheless their final decision was that gamification should be omitted, as it would be distracting and their concept would work better on its own. The second group ideated further on their features and decided to implement a progress bar portraying their advancement within a task, giving them a better overview of their advancement within the required section ( see Figure 13b). They also wanted to include a deadline feature incorporated into a calendar. This led to an ideation regarding an additional feature outside of the book. The feature would be present on the Lix bookshelf page, where the students can see all their books. From there, they could create reading tasks for different books, add deadlines to them and see their progress in each task ( see figure 13c). When setting a deadline on their tasks, they could see a colour changing notification within their calendar, that represented the time left to complete a task .



**Figure 13b:** Group 2: Gamification

# Outcome overview



Table 4 represents a summary of the workshop, the aim of each stage and the results gathered throughout the stages. The final results solved two different pains, while improving the motivation students have towards reading. One focused solely on Content understanding and did not include gamification, while the second resolved the time and task management pain with a very big dependency on gamification mechanics.

**Table 4:** Co-creation workshop - outcome

Stages:	Aim:	Outcome:
1	Cardsorting: Individual reflection on pains students encounter during their education.	Seven different individual prioritizations regarding each student's vision of their experience during their studies.
2	Cardsorting: Group reflection on the pains and how can they be prioritized	The main pain point for both groups was <b>Motivation</b> . The second pain they encounter was Content understanding (Group 1) and Time & task management (Group 2).
3	Prototype a Lix feature that could solve the groups main pains	<b>Group 1:</b> Responsive PA that could help summarise and access necessary content. <b>Group 2:</b> Time to read feature students can adjust to their needs and workload.
4	Incorporate Gamification within the new Lix solution	<b>Group 1:</b> Gamification was not incorporated into the solution, as it would not provide any value to the new feature. <b>Group 2:</b> Students incorporated the following gamification mechanics: <ul style="list-style-type: none"> <li>• Rewards ( badges, points, levels)</li> <li>• Progress bar</li> <li>• Countdown ( time pressure )</li> <li>• Colours representing deadline countdown ( time pressure )</li> </ul>



## 3.1.4 STRUCTURING THE EXPERIENCE THROUGHOUT WORKSHOP FINDINGS

As already mentioned in Section 2.4, breaking down the experience and creating milestones and stages is a key factor in the creation of successful gamification. Although the findings within that section were not sufficient to structure the experience, the co-create workshop provided insight on the students' problems and narrowed down the scope of the project. As the final outcome of the workshops were two possible solutions, one had to be chosen as the main idea for the development of the final feature. Throughout my time in the Lix Technologies team, many ideas for further development have been discussed. As Lix is opened for suggestions and always seeks feedback from their customers, the topic of a chatbot or PA has been raised. Although a good idea, the team has decided that such feature would not be possible to create, as it requires too much time and resources to complete. In addition, there is the challenge of the source of the required information for such a feature, how will it function and who will support it. Therefore the Time to read idea was selected as the inspiration for Lix's new feature. Taking that into consideration, the structure of the experience would be based on the findings gathered throughout the workshop.

According to the Gamification guide, we have already set the objective of the students. The next step of the process is to divide the experience into steps or milestones, that are achievable and measurable. In addition, each milestone would have to keep the student engaged and motivated in the process, ensuring they reach their objective.

### Objective:

Students must gain the required knowledge to pass their exams and perform above average."

### Stages/milestones:

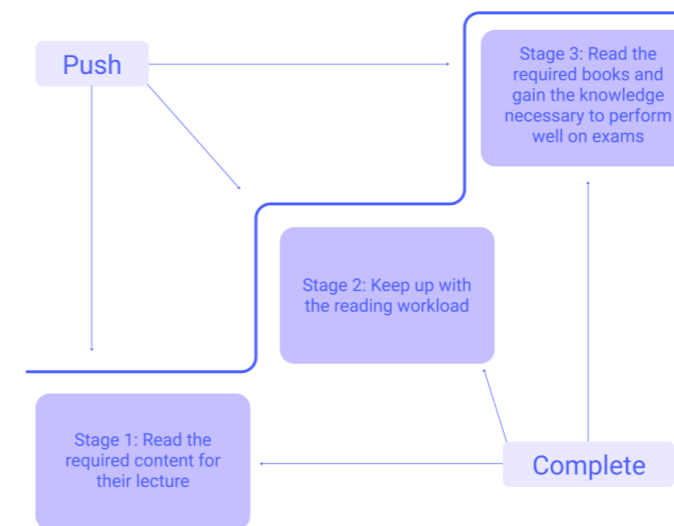
Students must:

- Stage 1: Read the required content for their lectures.
- Stage 2: Keep up with the reading workload.
- Stage 3: Read the required books and gain the necessary knowledge to perform well on exams.

Figure 14 presents how the milestones could help the students to achieve their objective. According to the Gamification Guide (Huang & Soman, 2013) **Push** refers to the motivation of the students to get to the next stage, while **Complete** represents how they are trying to understand the concept in each stage.

In the Lix Technologies case, the students are overwhelmed with their workload and are unmotivated to push and keep up with their reading load. Push is defined as the motivation students need to advance from one stage to the other. Therefore, it is important to identify what could keep the students motivated to keep reading and stay on top of their studies. Students struggling to complete each milestone could be struggling with managing their tasks and needing to gain additional skills. In this context, this is the inability to plan their time and have an overview of the amount of work they have to do in order to progress with their education. Therefore, it is important to identify what the students should learn from each stage, helping them progress within the next stages. By doing so, a better and more effective gamification could be incorporated into the solution.

**Figure 14:** Structure of the Experience





## 7.2 Co-design workshop

Using the already designed solution as an inspiration, a small co-design workshop was conducted with the product manager and the Lix developers. The aim of the workshop was to present the students solution regarding Motivation and Time Management and explore the possibilities of implementing such features into the Lix application ( see Appendix 5). The first step was to present the students idea of the new Lix features and their paper prototype, while introducing what pains they are solving with them. Subsequently, the new Lix application proposed by the students was broken down into different features, which were evaluated separately. The aim of the evaluation was to compare the amount of effort that would be invested into the development of each feature versus the impact and value it would provide for the users.

After the ideas were evaluated, a baseline of capability was created. This allowed to explore what is the minimum effort solution that could be created, what is a long term development and what could be a too complicated and overwhelming task to take upon (see Table 5). Some of the features were omitted from the solution, as the product manager believed that they could be overwhelming and unnecessary. In addition, the development team works with the Agile methodology principles. As the method allows focusing on customer collaboration and to easily respond to changes (Schmidt, 2016), the team decided on the minimum viable feature while taking into consideration other possibilities that could be implemented later on in the process.

In Table 5, the features and elements are classified into three main levels: The minimum effort, that could be implemented as soon as possible and still provide value for the users and the Long term development regards a possible future integration, that would take time to develop but will elevate the Lix application. The elements marked as restrictions represent the features that require a lot of high level development or are not providing enough value for the students, therefore have been marked in red and will be omitted from the solution. As the company is using the agile methodology, the most feasible solution are outlined and put on the table with the opportunity to always adjust and iterate on specific stage. As the new concept will be tested, the result can be used as a guide for adjusting improvements.

As a result of the workshop, the minimum effort solutions were outlined and selected, in order to build the first draft of the new Lix features. This draft was used to create a quick and dirty prototype to be tested with the target group. Subsequently, a small interview/meeting with the developers and the product manager will be appointed to evaluate the test results and to create a timeline for executing the new features.



**Table 5:** Feasibility evaluation

Feature ideas	Lix solution
<b>Input of tasks</b>	<ul style="list-style-type: none"> <li>Minimum effort: Manually input a reading task within the book, selecting specific pages.</li> <li>Selecting a chapter to read within the book</li> <li>Long term development: Manual input of reading tasks within the Lix application home page/bookshelf</li> <li>Restrictions: An automated task input by a third party</li> </ul>
<b>Estimate reading time</b>	<ul style="list-style-type: none"> <li>Minimum effort: Calculate the time based on algorithm of average reading speed</li> <li>Long term development: Setting the application to "learn" from the students' reading speed and adjust the time estimation</li> </ul>
<b>Timer/ countdown</b>	<ul style="list-style-type: none"> <li>Recalculate time based on progress within the task &amp; average reading speed</li> </ul>
<b>Points/levels</b>	<ul style="list-style-type: none"> <li>Rewards notification based on tasks, progression, chapters or books</li> </ul>
<b>Progressbar</b>	<ul style="list-style-type: none"> <li>Calculating progress within the book (Existing feature within the book progression)</li> </ul>
<b>Set/get deadline notification</b>	<ul style="list-style-type: none"> <li>Long term development: The features can provide value if used with a more no-book related tasks</li> </ul>
<b>Calendar</b>	<ul style="list-style-type: none"> <li>Minimum effort: Create an in application calendar</li> <li>Long term development: Connect the calendar with additional services (f.ex. Google Calendar)</li> </ul>



## 3.3 Quick and dirty prototype

A quick and dirty prototype was created to allow testing of the concept and if it is something students are interested in. According to Hooper and Hsia (1982), a quick and dirty prototype represents a "sketch" of the service or product. The aim is to use minimal effort to portray the system and test if it meets the user's requirements, so later on all additional elements could be developed if approved. If not, that allows for fast and easy changes in the "sketch" until it meets the approval of the user. In Lix's case the new feature was drawn on paper, illustrating its main functions. This included all the minimum effort development task, which allowed to see if a minimum viable product can create value for the students or long term development tasks had to be incorporated. In addition, a more detailed and complex prototype may distract the students with its features, while a simple one allows to focus on the specific area and feature. Although a quick and dirty paper prototype, in order to create a better feeling of how it will work, I decided to import it in the design program Figma. This allowed a more interactive and real life feel to it, as well as an easier way to test the concept.

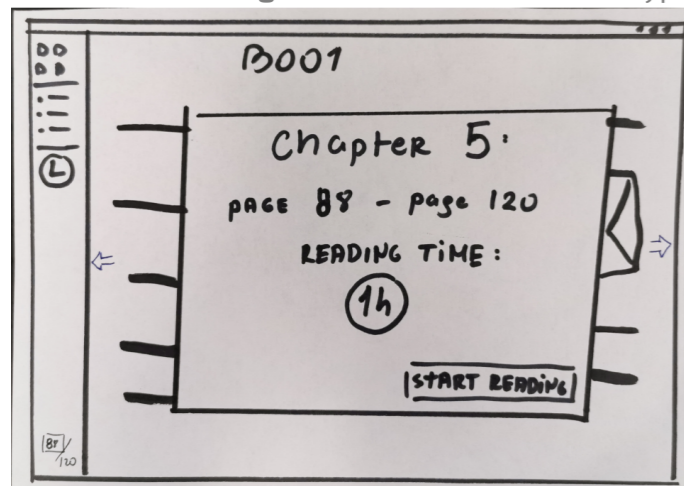
As mentioned before, the prototype I created as a simple drawing of the Lix application and the main feature on focus - the Time to read feature. It was drawn by hand and imported into Figma, in order to create the ability to interact with the feature. Figure 15 represent an image and the link to the prototype that was used for testing.

### 3.3.1 TEST GUIDELINES

The main idea of the prototype test was to create a short and precise test of the concept, how does it work and whenever it brings value to the student. Therefore test guidelines and questions were prepared beforehand. Tests were going to be conducted individually in order to receive the most thorough feedback. At the beginning, the students were going to be introduced to the theme of the thesis - pains, needs and expectations students have during their education, as well as the Lix application and what is a "quick and dirty" prototype. The students were asked few questions before the test started. They were asked about their personal struggles during their education and their needs regarding it. In addition they were asked if they have problems keeping up with the workload and reading load. After that, an explanation of the time to read feature was provided.

The next step within the test was to provide the students with the prototype. They were all given a laptop with the Figma prototype opened. As there was already an introduction to the Lix application, they were left to interact with the prototype on their own, so the usability and how intuitive the feature is, could be tested. After the test, the students were asked about their opinion of the feature, will it be beneficial, would they use it and is there anything more they would like to see incorporated into the feature. In addition a question regarding the choice of gamification was asked. A test guide (see Appendix 6) was created in order to ensure that the participants were asked the same questions and the data collected would be measurable.

Figure 15: Time to read Prototype



Click the image to access the prototype



### 3.3.2 THE PARTICIPANTS

In order to gather student for the test I reached my network for assistance. Although some of the students may have not been a Business and Economics students, I aimed to find students with similar education structure and reading load. The idea of the concept is that it is a universal tool that does not apply exclusively to specific education, rather than to all students that use books during their education. As Lix is both a subscription based application and also allows independent purchasing of books, all students can use the features and take advantage of the application. The participants were invited individually to conduct the test at a time that is convenient for them. Seven students volunteered to do the test.

The test was conducted with seven students between the ages of 19 and 24. The students had different education and level of degree. Most of them were Bachelor students and only two were doing their Masters degree. Their education field was within Business & Economics, Marketing and one student from psychology line of study. Although not Lix users, they all preferred to read their book digitally, rather than physically. Five of the students classified themselves as Strivers, while the other two described themselves as the Star students and the Slacker. The majority of the students were Strivers as Lix uses them as their main persona, but also the two additional personas were included in the test as well, in order to see if this feature will fit their needs and habits.

### 3.3.3 TEST OUTCOME

The test proved to be successful, as it provided positive results and ideas to further improve the concept. The majority of the students were very excited to see the feature. Having similar problems with motivation and workload management, they were excited to see a solution that may help them keep up with their reading.

The most common issue the students mentioned was motivation. As that was a broad term, when asked to explain what in particular was troubling them they were mentioning organizing their study materials, time or tasks. Some of them also mentioned managing their education, reading load and their part-time jobs. When the topic of time and task management was brought up, almost all agreed that it is something that they struggle with. The only students that was not bothered by that issue was the A-drage student.

All the students liked the concept and though it is a great way to keep track of their reading and help them with motivation. They recognized that it will be beneficial to them on a daily basis, especially when under time pressure or before exams. The Star student was excited to see the feature, as that will help them structure and organize their workload and may save them time for additional activities. The Slacker was also interested in the idea, as they imagined it would help them see how much effort and time they have to spend before exams.

Regarding the gamification of the app, most of the students were happy to see their achievements visualized, especially the Star student. Unfortunately, it was not something of interest for the Slacker. According to them, they did not need to complete every chapter of a book to gain knowledge - they believed that reading specific parts that are of most importance could provide as much knowledge as the whole book.

As all but one student agreed that it is a feature they would use, they had few comments towards the concept. They were curious of how is the time to read calculated and if it will be accurate for them personally. One student suggested a reading test to determine their speed and allow the application to fit their reading speed. Another student wanted to see a task/to-do list, where they can have an overview of their tasks and progress. The Star student and one of the Strivers suggested a leaderboard where the students in the class or in a group, can compare their progress and reading achievements.

The "quick and dirty" prototype test proved that the concept could provide value to students and be a very beneficial part of their studying process. They were excited to have a tool to help them manage their time and workload and make their education process easier. In addition, the gamification element of the application was motivating and encouraging.



## 7.4 Alignment presentation

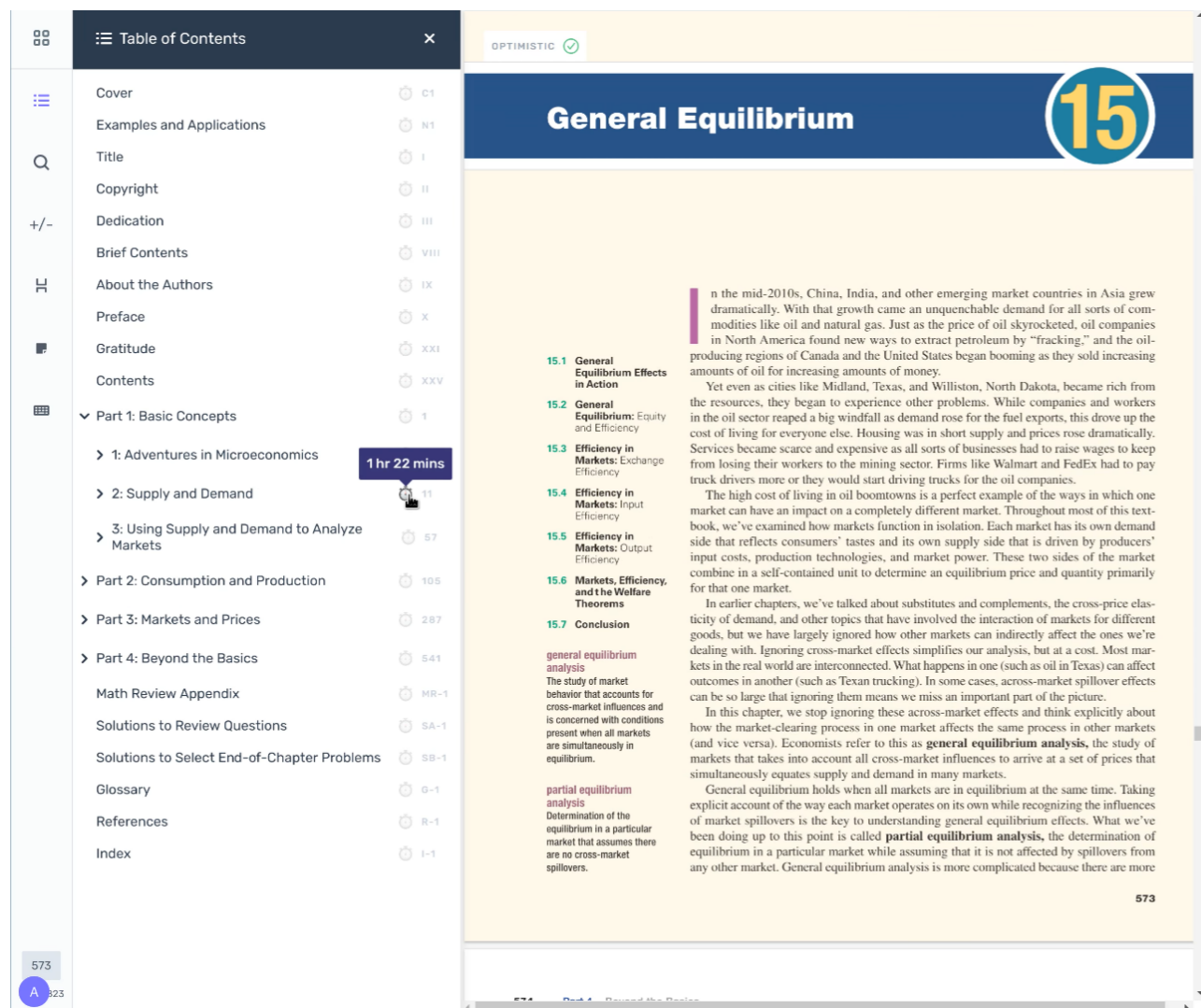
A small presentation of the prototype was prepared for Lix's Product team. The idea of the presentation was to show the concept and share the insights gathered from the prototype test. As a result, we wanted to agree on the final version of the feature, its design and how it could progress in the future.

The Product team was very excited to see the great feedback of the feature and what elements do the students need and liked to see. This allowed everyone to visualize the end product and start thinking of how and when can it be implemented. As the new version of the Lix application was set for a release for the autumn semester start, it was decided that the new feature would be in full development after that. Nevertheless, one of the developers was inspired by our previous co-design workshop and had already started on some iteration on the time to read feature.

### FIRST ITERATION

As a quick and simple implementation, solving the students' issue of getting an average of the time required to read a chapter, there was an indicator implemented in the table of contents within the app. As seen in Figure 16a, whenever the users hovers over the timing icon of each chapter, an information bubble appears, introducing the required time to read it. The time has been estimated on a students being able to read estimate 250 words per minute. As we had already discussed, this general estimation was going to be used within the first development of the feature. After seeing the usage and success of it, further personalized improvements could be done, making the feature able to learn and adapt to the user's reading speed.

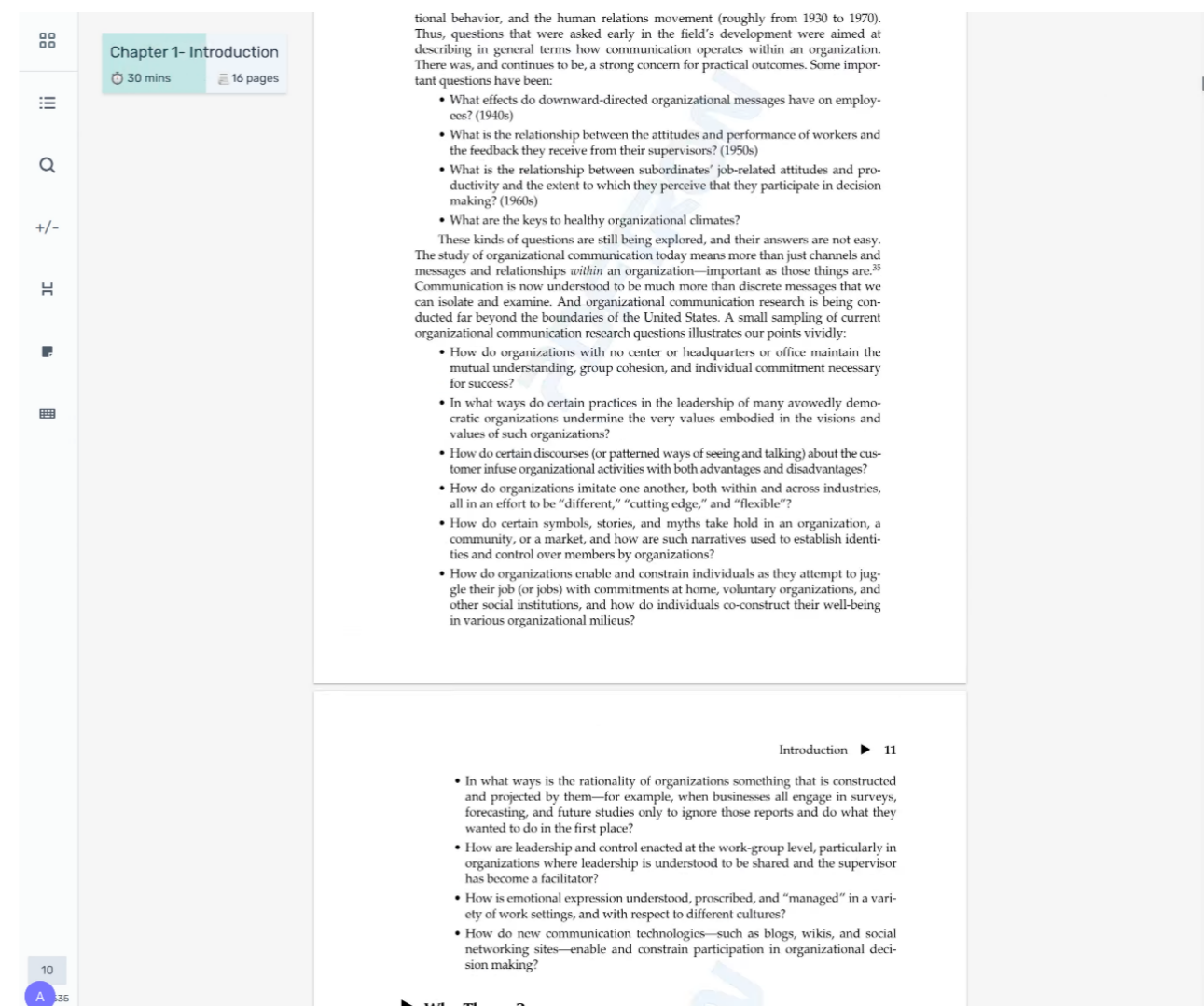
Figure 16a: First iteration



### SECOND ITERATION

The second iteration was focused on the Time to read feature development within the book, allowing it to track the progress of the reader. An in-reader panel was created, illustrating the current progress in a chosen chapter ( as seen in Figure 16b). The panel provided the number of pages that needed to be read, the time required to do so and the progress of the student during that specific task. The number of pages and the time to read were fixed, but the panel was acting as a progress bar whenever progressing within the content.

Figure 16b: Second iteration







## TIME TO READ SOLUTION

Taking into consideration the insight gathered through the prototype test and the initial iterations done by the developers, the final Time to read feature was agreed upon. As mentioned in the Co-design workshop (Section 3.2), there were many constraints that had to be taken into consideration while designing the solution. In addition, the Gamification guide (Section 2.1.1) was taken into consideration and in particular the next step of the gamification process - Identifying resources. As the prototype suggested, the feature would be offering two different versions of Time to read - chapter one, where the students can fast and easy select their chapter and engage the feature, and the manual input version, where the students would be able to select specific range of pages they need to read upon. Regarding the Gamification of the feature, the team looked into what resources are necessary to gamify the new process. The mechanics selected for incorporation were Tracking Mechanism, Currency and Levels (Huang & Soman, 2013). The Tracking Mechanism refers to any element that could measure and provide an overview of the students progress within a specific stage or action. This mechanism would be incorporated into the Time to read feature, where the students would have an overview of the amount of reading they should complete and track their progress throughout the process. Currency refers to the units that are being measured - this could be points, time or money. In the Lix new feature, this is represented by the badges that act as rewards whenever specific goals or stages are achieved. This leads to the Level gamification technique, that were incorporated into the application. Although the platform does not specifically provide levels, some badges depend on each other. This way they could act as levels, as specific badges should be acquired in order to receive a badge of a different/higher badge. The whole concept will be explained in detail in the following Service Concept Section.

Although there were several challenges and issues that occurred and were identified during the first two iterations, creating the Time to read feature was put on the product roadmap as a feature to be developed as soon as possible. With the incorporation of the Gamification element, the feature could provide additional value to the students and help them be more efficient students.



## 3.5 Service Concept

Based on the research, workshops and testing, the final service concept has been developed. As the feature has been planned for a future development, I had the opportunity to design the new concept. In order to do so and create the closest concept to what the feature would look and feel like, I decided to review the finding I have gathered throughout the different stages and revise them. Underneath, there is a list of the customer pains, needs and expectations, as well as all the relevant findings that have been taken into consideration when developing the final concept about Lix's Time to read feature.

### DISCOVER:

- Lix has to provide additional value to their product in order to distinguish themselves from other e-readers.
- Education has been changing and adapting into the digitalare, creating more online solutions for student.
- Students with many issues during their education, some of which are motivation and time management.

### DEFINE:

- Generation Y requires constant stimulation and challenges so they can be engaged and motivated towards their studies.
- Gamification engages users and stimulates motivation.
- Using gamification to help learning and visualizing progress proves to be motivating and fulfilling for students.
- Students require engaging content, lectures and ways to study.
- Students are motivated by achieving specific goals, like passing exams and getting certain grades.
- Students struggle to keep up with their workload, due to lecture load, reading load, group work and other activities outside of their university tasks.
- Students seek ways to be more organized, plan their time better and keep everything accessible and in one place.

### DEVELOP:

- The biggest issue between students is motivation, but their solutions to that problem is solving other issues like time and task management.
- Students believe time to read will help them keep up and manage their time better.
- Gamification can increase the engagement towards given tasks and especially keeping up with their content.
- Incorporating Time to read feature in the Lix platform would prove to be helpful and add value for the students.

The main findings collected during the phases were used in the creation of the final service concept. Although the initial findings were broad and general, throughout each phase they were narrowed down in order to create the final solution that will provide additional value to the Lix application. The solution is based on the prototype created in the Develop stage and the feedback gathered from both students and the Lix team. The platform provides many different benefits, thanks to the features incorporated in it, and although Time to read is not a stand alone feature on its own, it proves to be a great addition to the application and can benefit the users immensely.



### 3.5.1 FEATURE DESCRIPTION

The time to read option will be implemented into the Lix application as an additional feature. The aim is to provide additional value to the users and make studying easier. This way the application can be closer to meeting the student's expectations of a "smart study tool", where they have access to everything they may need during their education. In addition, the aim is to increase students motivation with the involvement of gamification.

The feature can be used whenever the user interacts with a book in their Lix application. Therefore, the design of the feature will be based on the design and functionality of the Lix platform. As shown in Figure 17a and 17b, the feature can be activated in two different ways: by choosing a specific section or chapter within the book's table of contents ( Figure 17a) or by selecting the specific pages using the Time to read feature in the toolbar ( Figure 17b). The Time to read feature incorporated within the table of content has an estimate of the time required to read it whenever the user hovers over the clock icon ( Figure 17c). This allows for a better overview of the size of the chapter and the time it would take to complete it. On the other hand, the manual version of the feature provides the estimated time to read, whenever the user inputs the desired page range they are planning to read (Figure 17d).

Regardless of the method the user chooses, the feature will take them directly to the beginning of a section or page they have selected to read. On the top left corner they would be able to see a small rectangular visualization that represents that Time to read feature is active within the book ( see Figure 17c). While the user progresses within the book, the feature would keep track of the amount of pages and time left, as well as visualize within the rectangular. The tool itself acts as a progress bar that fills in with colour when the student progresses in the section. Whenever the task is completed, the progress bar would be completely coloured and the time and pages would have reached zero. The feature will display a message telling the user they are done with their reading.



Figure 17a: Time to read within Table of contents

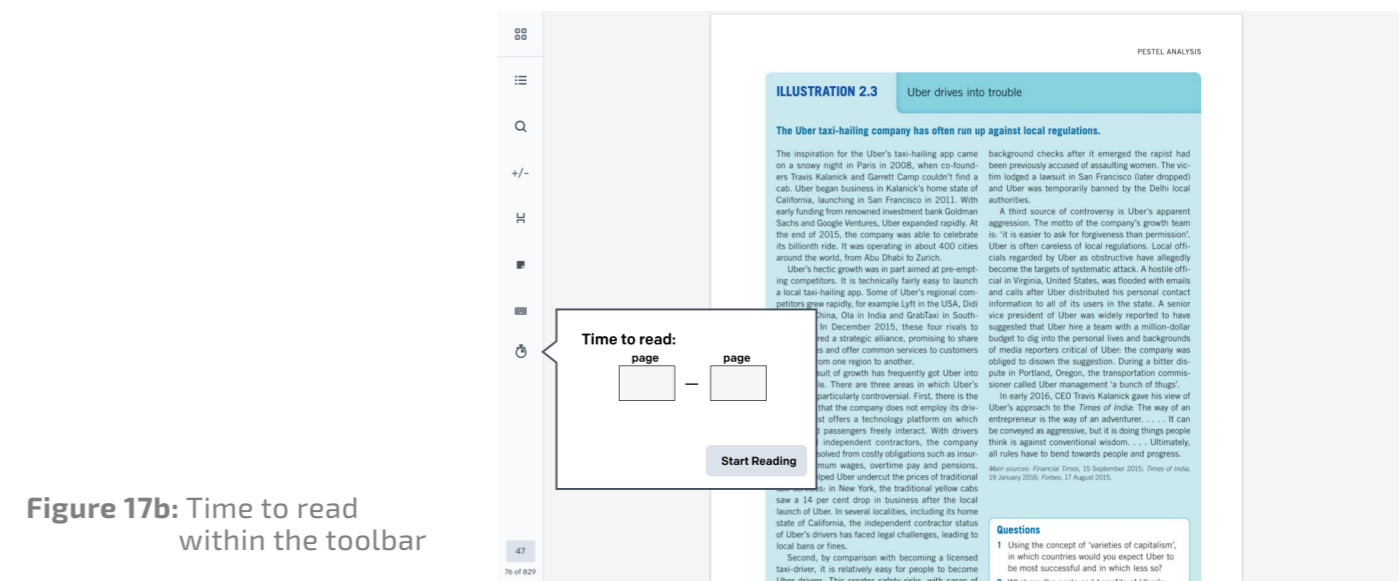


Figure 17b: Time to read within the toolbar

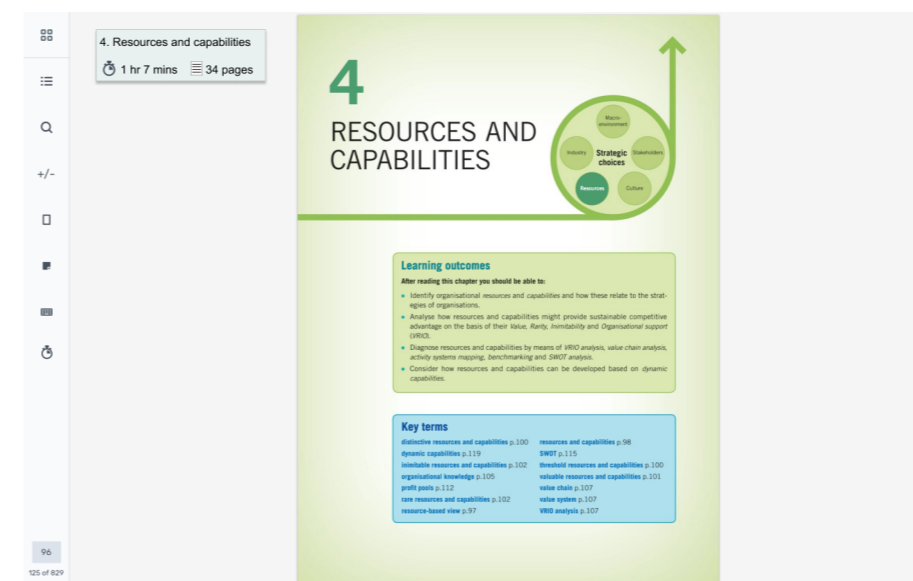


Figure 17c: Time to read activated within a book



### 3.5.2 GAMIFICATION WITHIN THE SOLUTION

The Time to read feature focuses on solving two main pains: Time management and Motivation. Therefore the gamification element incorporated into the feature is of key importance to its success. Although the feature itself involves gamification element, like the progress bar and the time countdown, in order to increase the students motivation, additional gamification mechanics would supporting the solution.

The choice of the gamification elements used with the solution are based on the last stage of the Gamification Guide (Section 2.1.1): Applying gamification elements. In order to create a motivating and engaging gamification, there should be specific game mechanics that will push the user to complete their stages, so they can reach the objective the process has set. The game mechanics are classified as Self-elements and Social Elements (see Table 2) . The Time to read feature will focus on using Self-Elements to motivate the students. This means that whenever a stage is complete, the user will receive a specific reward in the form of a badge. These elements encourage the users to compete with themselves and focus on their personal achievements. This will ensure a higher probability that the feature will improve motivation and help students succeed within their studies.

The badges are based on different achievements: Time spend in book, Chapters read in book and Books read throughout time. The time and chapter badges will start at an easy level and increase the difficulty over time. As it can be seen in Figure 17d, the badge starts from an easy level. The purple badges measure the number of chapters completed with the Time to read feature. The green badges present the number of hours the feature has been used and the amount of time the user has spent reading. The maximum badges levels would be calculated depending on the amount of books each user has. Badges that have not yet been completed are in grey colour and when the badge requirement is complete, the badge would change to the specific colour of the achievement area.



Figure 17d: Time & Chapter badges

Book badges are assigned by the number of books read ( see Figure 17e). When a book is complete, the respectful badge changes colour from gray to red. Whenever all the books are completed, there is a final badge with “ All books” sign, showing the user all the books have been completed. In order to create a more stimulating and rewarding feeling, the final badge has a crown on top, showing the student that they are achieved something impressive.

Figure 17e: Books Badges



The incorporation of the badges would be positioned on the side of the platforms bookshelf (see Figure 17f). This way, the users could see their progress and achievements every time they open their Lix application. In addition, the badges represent their work throughout all books, therefore having them within the common space where all the student content is, provides a better overview and sense of completion. In order to not overcrowd the bookshelf, whenever the application is opened the user will be able to see only the most recently earned badge. To get a more general overview of their progress, the student could open a drop down that will visualize all the badges, both completed and future achievements ( see Figure 17g). This provides a better understanding of their progress and helps the user see what their next goal is, motivating them to work hard to reach it.

Figure 17f: All achievements

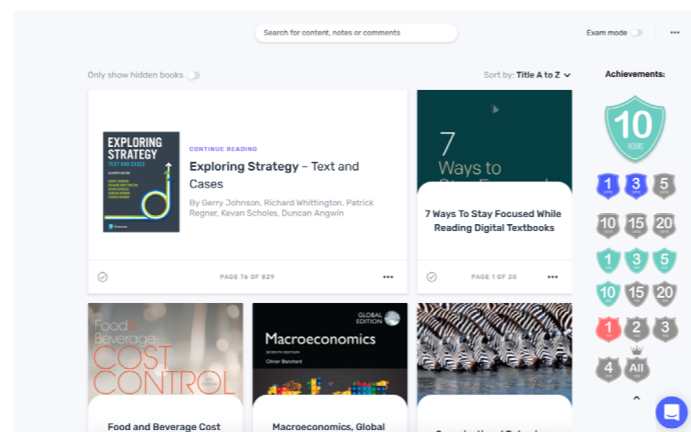


Figure 17g: Most recent achievements

### 3.5.3 DATA GATHERING

In order for the Time to read feature to function, the platform needs to keep track of the amount of time students spend into the books, the chapters they read and what books they complete. This information is essential not only for the Time to read feature, but also of great importance to the publishers. The publishers are very dedicated to their product and they are eager to see how it performs. As physical books provide no data on the usage of the book, publishers turn towards their digital editions and the platforms providing them, to gather information regarding each book's performance. Therefore, the Time to read feature, provides value not only to the users but also to the publishers. Based on the interaction with the feature and the data collected from it for the badges, the publishers could get a thorough overview of the usage of their books. They could be provided with statistics of how much time on average the student spends in their book, what are the most read chapters and if there are any chapters that are neglected. This would help the publishers reevaluate their content and take actions to adjust it, so it provides more knowledge and value to the students in the future.



# Reflection

Based on the case described within the previous sections of this thesis, the following section will focus on a reflection of the implementation of Gamification within an educational platform.

## ADVANTAGES AND DISADVANTAGES OF GAMIFICATION

Gamification has been used as a tool for increasing customer engagement within many areas. Although being used in many different contexts, Gamification within Education is an area that has not been developed extensively. The reason behind this, is the fact that gamification could have disadvantages and drawbacks, that could ruin the experience instead of improving it.

According to Gamification in Learning and Education (Poole, Kemp, Patterson & Williams, 2014) the method provides many advantages if used correctly, as well as disadvantages when not applied properly. Gamification is a great way to create engagement within a service that is not game related. It provides additional motivation to the user to interact with the service and creates a positive feeling within the customer. Furthermore, the method provides additional value and a feeling of accomplishment. By being challenged and receiving specific rewards, the customers' interest in the experience can be increased.

On the other hand, Gamification could ruin the user experience preventing their motivation, if used incorrectly. The main concern regarding the method is that it may prove to be distracting rather than helpful. According to Huang and Soman (2013), the same mechanics that are designed to engage and motivate the users could demotivate them. If the gamification stages or milestones are too easy, the customers could feel bored.

However, if the stages are too hard, that could demotivate them as they could experience feelings of failure and inability to achieve the desired goals. Furthermore, gamification could be a threat to the service core value. The reward system could affect and weaken the students intrinsic motivation to learn. If the students feel that the rewards are not representative of their work and they do not measure their achievements, the frustration may push away the customers from the service.

## LIMITATIONS

The purpose of this thesis is to explore gamification and how its implementation could support the service experience within an educational platform. During the process of the thesis, several limitations have obstructed any further development of the method and its incorporation within the Lix platform.

The knowledge gathered from the research and the co-creation workshop provided a wide range of gamification possibilities that could be explored further within the process. Unfortunately, during the Co-design workshop, gamification was narrowed down to a minimum that could still provide the necessary value for the customer. The resources of the company have limited the possibilities of how much gamification could be incorporated. As the company is a start up, their biggest concern is spending too much time on developing complex features that may not bring immediate value to the students. Therefore, the game mechanics were narrowed down to a minimum, creating a basic gamified feature that would require less effort and provide enough value to validate additional development.

Testing of the concept has provided positive feedback regarding the new feature and the gamification involvement into the experience. Nevertheless, a functional in-app implementation would have provided better and more thorough insight regarding the concept. As the gamification requires long term engagement and interaction with the feature, a prototype test could not evaluate the success of the new process. Therefore, the ideal testing would have been prolonged usage of the feature within the necessary context by the beta testers. This would have provided the company with a better evaluation of the product value when delivered through a longer period of time.

Due to the game design simplicity, the current gamified solution could prove to be usable for a limited amount of time. As the game mechanics of badges are based on the needs of the students during the semester, the question of what comes next arises: How will the badges function on their next semester?

Creating an overwhelming number of badges could prove to be confusing and distracting to the students, while annulling the previously gathered achievements would diminish the users' hard work. In order to avoid students getting bored and adapting to the Gamification, further development of the feature should be taken into consideration.

## FURTHER DEVELOPMENT

In order to answer the research question set at the beginning of this thesis, further development of the Gamification should be discussed. Although the gamification supports the new feature, creating a solution to many of the students' needs and pains, in order to ensure it's success and the engagement and motivation it provides to the users, further development should be taken into consideration.

As mentioned above, there were some limitations that reflected on the development of the final gamified solution. Although it followed the Gamification Guide, the final stage of *Applying gamification elements* was not followed completely, due to those limitations. Therefore, this section will focus on the improvement of the Gamification in relation to the Time to read feature.

As it was already defined throughout the *Structure the experience stage*, the key to building a successful Gamification inside the platform is identifying the right milestones. In order to motivate the user to complete those milestones and achieve their final objective, they had to push through and complete the stages ( figure 14). As already mentioned earlier in the thesis, the **Push** is the means that motivate the students to get towards the next stage, while **Complete** refers to the way they are trying to understand the knowledge and concept in the specified stages.

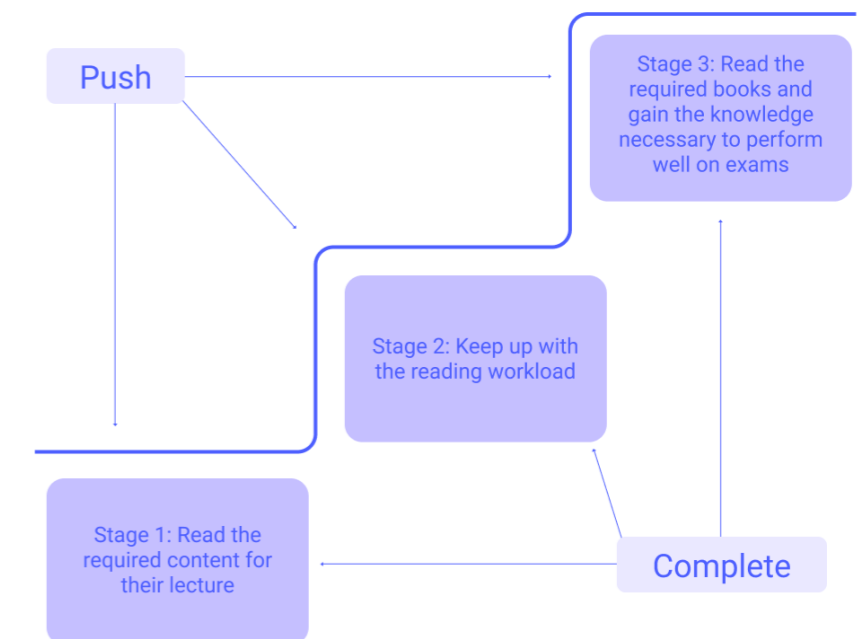


Figure 14: Structure of the Experience

The current Time to read feature has been focused on applying Self-Elements game mechanics (see Table 2). The badges marking the customers' achievements, focus solely on the students personal accomplishments and create a competition with themselves. These elements support the **Complete** stage of gamification, helping the students gain the required knowledge and succeeding in finishing the specific stage.

Although the badges still provide motivation to continue the process and complete more achievements, the feature is missing the **Push** to progress towards the next stage. This is the additional motivation that will drive them to complete the desired objective and eliminate discouragement and boredom.

Therefore, the Social Elements should be incorporated within any future development of the Gamified feature. As suggested by the students during the Co-creation workshop and the prototype testing, a leaderboard is a game mechanic that would prove to be motivating and interesting for the users. A competition within the class or between groupmated engages the users extrinsic motivation to be the best and on top, driving them to complete more milestones and stages in order to progress throughout the leaderboard.

**Examples of Game Mechanics  
(Self-Elements vs. Social Elements)**

Self-Elements (Complete Stage)	Social Elements (Push Stage)
Points	Leaderboards
Levels	Virtual Goods
Trophies/Badges	Interactive Cooperation
Virtual Goods	Storyline
Storyline	
Time Restrictions	
Aesthetics	

**Table 2:** Game Mechanics



Product  
Report

## 4.1 Feature in-App

The Lix platform has been evolving within the last year from a simple E Reader into a smart study tool that makes studying easier. In order to reach that status, additional features have been developed, to provide additional value to the students and improve their study process. In addition to the existing notes, highlights and search, the platform has incorporated features like Translation, Dictionary and Text to speech. Furthermore, the product team has developed features allowing Upload of any extra digital content and a notebook, allowing the students to keep their lecture notes together with all their study materials.

This "everything in one place" platform helps a lot of students with their study process and solves many of the pains they encounter during their education. Therefore, the Time to read feature would help elevate the platform to another level, solving the problem of Motivation and Time Management. In addition, the gamification integrated within the feature would help the users maintain their motivation to use the tool, while helping them to achieve their best.

The feature can be used only within the books, where the users can activate the feature and use it while interacting with their content. The feature calculates the average amount of time required to read specific amount of the book. The students have two separate options to select their reading load: a chapter or section based time to read, where the students can choose what to read directly from the Table of content and a personalized version, where the student can input a selected range of pages to activate the feature. The feature tracks the user progress within the set task, providing a visual overview of their advancement and the time and amount left to read. When the task is done, the user receives a message confirming the completion of their goal.

The gamification incorporated within the Lix platform is closely connected with the feature. When used, the data gathered throughout the process is collected and stored, in order to measure the student progression and achievements. Badges are rewarded on specific milestone bases - when the student completes specific number of chapters or hour using the Time to read feature. In addition, the user gains a badge every time they complete a book. The overview of the badges can be seen on the Lix bookshelf, starting with the most recent badge earned.



# Deliver

# phase

The delivery phase of this report will be represented as the product report that will be delivered to Lix Technologies as the final result of this thesis. The report focuses on the final concept of the Lix platform new feature and how it will provide value to the users of the platform. The report will focus on the final, ready to deliver and implement feature and well as all the materials that will be provided to the company. Furthermore, the report will take into consideration all the insight gathered throughout the thesis and suggest how the feature could be implemented in the future and what changes could be done to provide even more value to the students.

## 4.2 UX flow:

To get a better overview of the feature and how it works within the Lix application, a UX flow was created ( see Figure 18). The flow shows the steps required for the student to activate and use the Time to read feature. Following the set steps and interacting with the Time to read will allow the students to achieve their goal of reading the required content.

### UX FLOW:

*Definition:* A series of steps a user takes to achieve a meaningful goal. User flows show the pages, logic, and actions required to complete the goal (Handley, 2018).

Figure 18: UX flow



## 4.3 Customer Journey

In order to see the value the Time to read feature provides and how it reflects on the students' experience during their education, a New Customer Journey was created. The New Customer Journey is using the current customer journey (Section 2.4.1) as a base, creating a comparison between the students' experience with the current Lix application and the experience with the Time to read feature incorporated in the platform.

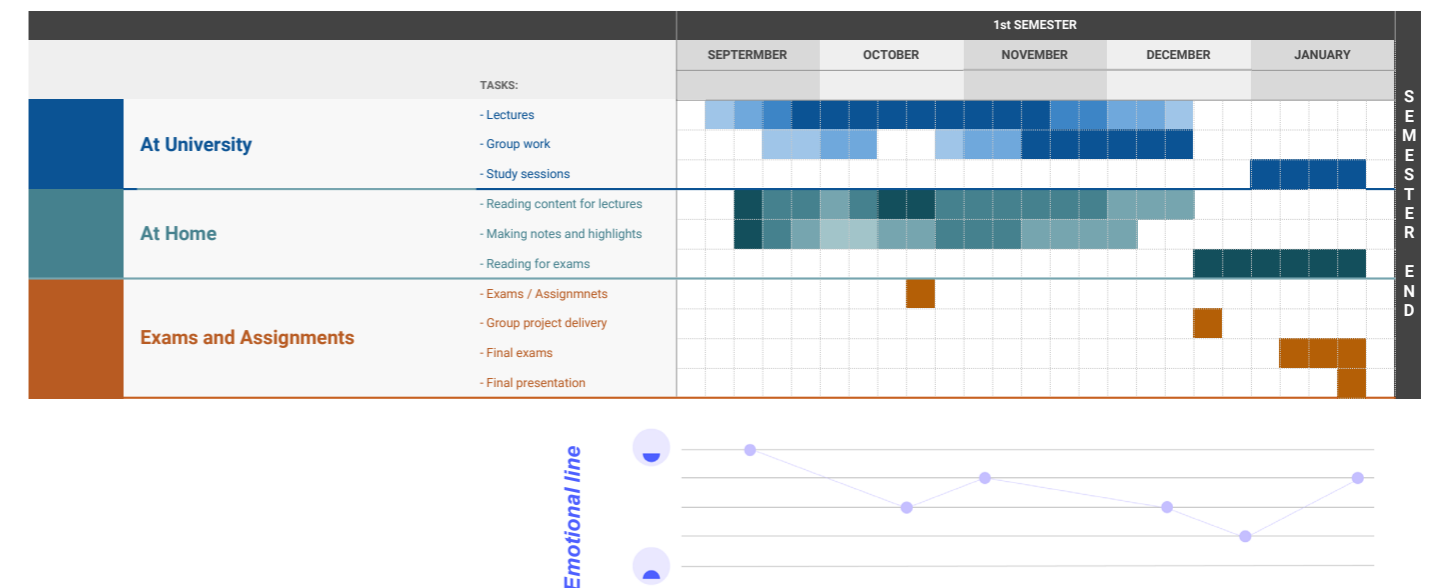
Although the New Customer Journey seems similar to the existing one, the main changes are within the Home section of it. As it could be seen in Figure 19, the workload of Home and Exam parts has not changed. That is because the process there is dependant on the University and Teachers and set by them, rather than on the students' ability to manage their studying. Taking that into consideration, the main focus of the journey would be on the At Home section.

The Time to read feature strives to provide help for the students when struggling to manage their time, oversee their study load and keep motivated. Therefore, the reading content of lecture journey has been improved. If the students have a better overview of how much time they should spend on preparing for class, they have an opportunity to plan their activities and complete their tasks respectively. In addition, the gamification of the feature provides further motivation, as students would like to earn as many badges as possible.

The improvement of the students' behaviour when preparing for lectures reflects their highlighting and note-taking process. When the students are reading the content, most of them tend to annotate the most important parts. Therefore, with the increase of the content read by students, the annotation process would improve both in quantity and in usage during the semester. Although reading for exams is a part of the At Home section, the intensity of the process there would not be changed. Even if the Time to read feature has been used during the duration of the semester, the students would still strive to achieve their best and would re-read their content closely to exams. This is the reason why the emotional line is still not positive - even though the students have read their content, the stress of exams and feeling prepared is imminent. The feature could also be of help within the exam preparation period, as it can still help the students structure this stressful time in order to help them cover as much content as possible.

The journey provides a great overview of the improvement the Time to read feature could have on the study process of the Lix user. Helping the students be more efficient and more motivated will not only reflect their study process but also their performance within their studies. It could also decrease the stress and anxiety levels of the students during their exam periods.

Figure 19: New Customer Journey



## 4.4 Scenarios of usage

To validate the new feature concept and to examine how effective the solution is, scenarios were used to help review and justify the concept. Design scenarios are hypothetical stories, that based on the gathered research, which help create a more realistic and meaningful situation of how the concept or service would be used (Stickdorn & Schneider, 2011). The scenarios have been based on the existing personas and that would help examine the value to feature provides to the different types of students. Three scenarios were created, one for each of the personas identified in Section 2.3.2.

The  
Star

Margo chose to use the Lix application, as it was affordable and provided her with everything necessary for her education. She is always prepared for her classes and she manages her workload by creating tasks she needs to complete in her calendar. She prepares them weekly, in order to have the most recent update of the lecture load, the required reading and her assignments. In addition, she likes to read additional materials, so she can learn as much as possible and be on the top of her class. When Margo started using Lix, she saw in their onboarding tour that there is a feature called Time to read. She was very interested to try it, as she would have a better overview of her time and would be able to manage it even better. The first time she tried the feature, Margo received a badge. This sparked her interest and gave her additional motivation to use the feature. She wanted to see all the badges collected by the end of her semester. Furthermore, she was managing her time more efficiently, which allowed her to make even more time for additional reading and exploring new areas of her education.

The  
Striver

Julius was overwhelmed with all the books he had to buy for his semester. So he was excited to try the Lix subscription and soon decided to use it, instead of buying physical books. As it was the beginning of the semester, Julius was very eager to perform at his best and always be on top of his reading. After a few weeks though, he was struggling to keep up with everything - daily lectures, group work, his part-time job and spending time with his new friends. So he decided to try the Time to read feature. He wanted to know how much time he needs to read a specific chapter, so he can plan his time better. He saw that what the teachers required was not taking that much time, and he had just enough time to read it before going to work. Julius was feeling so proud of himself and his achievement, he figured that he could use the feature to check the time required for his reading assignments and see how he can fit them into his busy schedule. He also liked the badges he was receiving during the process, making him feel like he is conquering his studies one step at a time.

The  
Slacker

Zoe was introduced to Lix in the first weeks of her education. All the students in her class have been using the service and have been recommending it. As Zoe's parents were pressuring her to buy her books, she decided to ask them to pay her subscription instead. She did not want to overcrowd her room with books and also she preferred digital books because they were easier to search through. Although she had the service, she was not using it intensely - she occasionally searched for a definition, a model or an image if she did not understand something in the lecture. When the exam period approached, Zoe decided to meet with her fellow students for study sessions. She was hoping to gather as much knowledge as possible through them, so she can pass the exams. They were all talking about the Lix Time to read feature, that help them organize their time and be more prepared. As exams were approaching, she had to read some chapters and decided to give the feature a go. It was quite helpful, as she was cramming up a semester content within few weeks. It allowed her to see how much is possible and how much she can read within the short time left before an exam. She didn't mind the badges she was receiving, as they were showing her that she is learning more, but she was not striving to gather them all. She just wanted to learn the most important so she can pass her exams and semester.



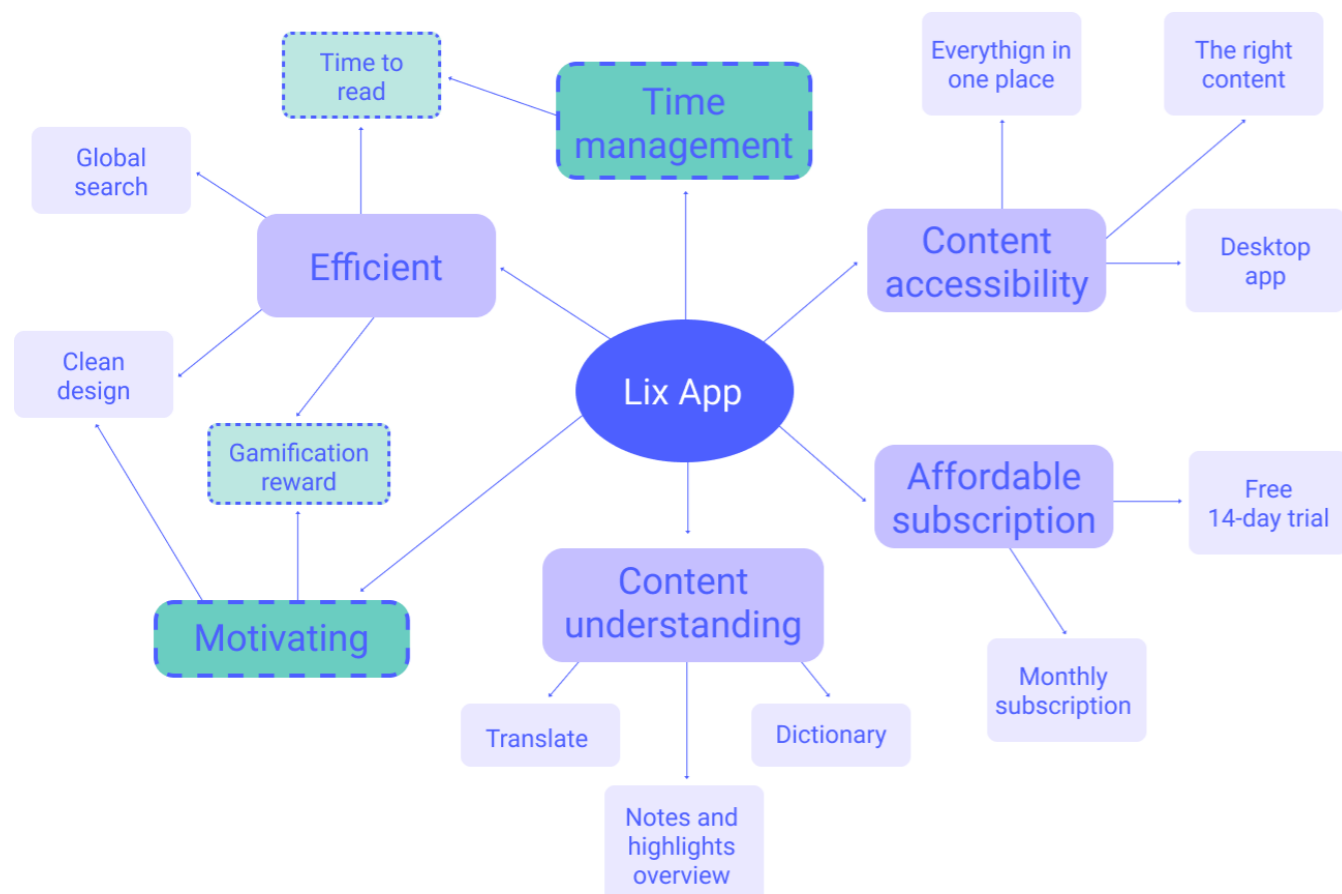
## 4.5 New Value Constellation

Lix strives to provide the students with a study tool that not only allows them access to their books on a subscription basis, but also a tool that provides them with value. In order to get a better overview of the value the platform provides, a New Value Constellation was created based on the incorporation of the Time to read feature.

Not only does the Time to read feature provide additional value in the form of Time management and Motivation, but it also adds value by helping the students be more efficient.

The Value Constellation focuses on the offerings the platform provides to the students and the value they bring. Figure 20 is based on the current Value Constellation which is in purple. The offering of the Time to read feature and the value it provides are visualized in green colour. The values are divided into six different categories: time management, motivation, content accessibility, affordability, content understanding and efficiency. The different values that the platform provides are supported by one or more Lix features. The Time to read feature provides two values to the application: Time management and Motivation. The calculation of an estimate time to read the content, allows the students to organize their day better and manage their tasks more efficiently. In addition, combined with the gamification of the feature, it provides the students with additional motivation to read their content and keep up with their studies.

Figure 20: New Value Constellation



## 4.6 Motivation Matrix

According to Morelli and Tollestrup (2007), the Motivation Matrix is a key tool when trying to understand the contribution provided by the most relevant actors towards both the service and to each other. This helps get a better overview of the connection between the actors and the motivation behind their participation in the process.

As the main actors in the Lix concept are the students and the publishers, the Motivation Matrix was focused on them and their expectation of a collaboration with each other. As the Lix platform has already provided a lot of knowledge and value to the actors, the motivation matrix would focus on the value the Time to read feature would provide to each one of them.

The Motivation Matrix ( see Figure 21) focuses on what is required from each actor, so the service can function successfully. The way the tool works is by taking the stakeholders on the vertical axis of the Matrix and matching them with the stakeholders on the horizontal axis, creating an analysis of the way the specific actor is influenced by the other stakeholders. In the case of a stakeholder paired with themselves, the cell of the Matrix is filled with information regarding what the stakeholder provides and gains from the service. The analysis of the Motivation Matrix provides deeper knowledge of the additional value the gamified feature provides for each actor.

Figure 21: Motivation Matrix

	Students	Lix	Publishers
Students	<ul style="list-style-type: none"> <li>• Accessible books</li> <li>• Get an overview of their reading load</li> <li>• Plan their time</li> <li>• Reduce stress</li> <li>• All in one platform</li> </ul>	<ul style="list-style-type: none"> <li>• More paying subscribers</li> <li>• Data</li> </ul>	<ul style="list-style-type: none"> <li>• Money</li> </ul>
Lix	<ul style="list-style-type: none"> <li>• Feature to help manage time</li> <li>• Motivation to read content</li> <li>• Badges</li> </ul>	<ul style="list-style-type: none"> <li>• Gain new paying subscribers</li> <li>• Keep current users</li> <li>• Stand out from other E-readers</li> <li>• New Universities partnerships</li> </ul>	<ul style="list-style-type: none"> <li>• Data of book usage</li> <li>• Recommendations for improvements</li> </ul>
Publishers	<ul style="list-style-type: none"> <li>• Cheap and accessible books</li> </ul>	<ul style="list-style-type: none"> <li>• E-Books</li> </ul>	<ul style="list-style-type: none"> <li>• Better overview of the students interaction with the content</li> </ul>

## 4.7 Suggestions for implementation

As the feature concept has been developed on the basis of the ideas and solutions of the Co-design workshop, as well as it being a future implementation of the already existing Lix application, the whole concept has not been tested with the students. This is why, the first and most important step is to implement a beta version of the feature and incorporate it within the existing platform. Subsequently, the new version of the Lix application should be released with the company's beta testers, to see their perception of the feature when used in the real, everyday usage of a student. Since the concept has been tested with the use of the prototype, the idea of such a feature has been validated by students. Nevertheless, an actual functional version of the feature would give the users a better feeling of the functionality and advantages the Time to read feature. In addition, it will provide additional knowledge towards the use of gamification and see if it provides the desired motivation and if there is an opportunity for further development

### 4.7.1 FUTURE OF THE FEATURE

During the student workshop and the prototype test, the students were asked about the perfect Time to read feature. Although the developed concept is still providing the desired value, further suggestions of its development could be taken into consideration.

#### Stage 1:

The first and most important improvement of the feature should be a more accurate and personalized estimation of the Time to read. The time could be calculated based on the user's performance when reading within the book. The value a feature that fits the user perfectly and is altered to their speed would make the Lix application even better at helping with the students' efficiency.

#### Stage 2:

Further development could be focused on manual input of the reading task within the platform's bookshelf. This way it could provide a better overview of the students reading load for all of their books, rather than one. Students could create task of their reading assignments, which could display the Time to read and the amount of pages that should be read. When clicked, the task redirects the user into the specific book and chapter assigned to the task.

#### Stage 3:

The final possible expansion of the feature could be an input of tasks by a third part. Students have been using many different tools and websites for their studies and some Learning Management Systems prove to be unclear and not user friendly. Therefore, a system that allows the teachers to directly input the reading assignments into the students' Lix application could help them save time and be more efficient.

### 4.7.2 GAMIFICATION IN THE FUTURE

During the development of the Time to read concept, an Educational Gamification Guide () was used, in order to ensure the successful implementation of game mechanics within the new Lix feature. Although the gamification process was followed strictly, there were some restrictions that prevented the complete development of the game journey. In order to create the best and most successful gamification, there should be two game elements involved: Self-elements and Social Elements. The feature concept involves the Self-element with the use of badges, but is lacking the Social Element, that further pushes and motivates the user to use the service. The Social Elements could be leaderboards, interactive cooperation, virtual goods or storylines.

Based on the students' suggestions during the Co-design workshop and the prototype tasting, a leaderboard is a gamification element that the students feel suits the feature and the context. Creating a leaderboard would increase the users' motivation to read, as some students would like to perform better than everyone else, while others would not like to be slacking behind on their reading. Having students progress and achievements on a leaderboard would create a competition feeling, that would result in more students completing their mandatory reading.

# Conclusion

This thesis has been exploring the development of a feature that would support the Lix Technologies platform and provide additional value to its users. The company strives to create the ultimate study tool, that will combine everything the students need in one place, making all additional tools obsolete. With the advancement throughout the Digital era, digital context and tools are becoming an inseparable part of the students' lives, helping them improve, be more efficient and manage their studies better. Lix has been focused on the students needs and pains, as well as their expectations, in order to create a successful and practical service. The insight gathered throughout the research process has revealed five main pains the students encounter during their education: Time and task management, Organization, Workload, Content understanding and Motivation.

In order to narrow down the pains and ensure a successful development of the concept, the customers involvement was required. A collaboration with the students in the design process resulted in the creation of a new feature solving two of the main students pains. The co-creation workshop provided valuable ideas for the development of the new concept and the test of the prototype with the students involvement helped shape the final solution. Furthermore, the whole process was supported by the Lix team, providing alignment and guidance regarding the possibilities for the feature. Involving the main actors into the process helped create a feature that would increase the value Lix provides for their users and meet the students needs and expectations.

As a result of the research and collaboration with the customers, the Time to read feature was created. With the implementation of Gamification elements, the feature was solving the students problems with Time management and Motivation. After testing the concept with the target group, the new feature proved to be a desirable tool for the students and one that will help their efficiency increase. In addition, the Gamification elements of the badges were engaging the students interest of feature and increasing their motivation to read the required content. This will improve the students' commitment to their education and provide them with a platform that could make their study life easier.

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# Appendix

## Appendix 1 : Student survey outcome

 <b>General students research: Surveys</b>	Test Description	
<b>Objective of the test</b> Get to know the potential users Find the students' needs, pain points and expectations during their education Understand what could be done to improve their way of studying and help them achieve their best.	The survey was introduced throughout Lix's facebook page and shared around on different student related pages. It was answered by <b>101 student</b> , 57% of which were female and 43% male. The majority of them were in the age between 20-30 years old (88%). The participants were from <b>27 different countries, 40% of which Danish students.</b>  Most of the students were part of <b>CBS 21%, AAU 18%, DTU 15%, RUC 10%, KEA 7%, KU 7%, Aarhus University 6%</b> . The field of their educations are: <b>Science &amp; Technology 40%, Economics, Business &amp; Law 28%, Humanities 18%, Health 8%, Marketing &amp; communication 6%</b> .	
<b>Date</b> Conducted during Fall semester of 2018	41% of the students are doing their <b>Master degree</b> and 38% <b>Bachelor degree</b> . 57% of students <b>read the assigned chapters</b> in the curriculum and rely on notes, while 26% <b>read beyond the assigned chapters</b> in the curriculum and find extra material relevant for their studies.  Students rate the way they learn best as following: <b>Visual 77%, Logical 61%, Social 40%, Verbal 36, Physical 36%, Solitary 27%, Auditory 18%</b> .  • <b>Disclaimer:</b> Few questions would be saying X/40 this is because the question was added after our first revision of the survey.	
Findings		
<b>Before starting the semester:</b>	<b>Collaboration</b>	
<ol style="list-style-type: none"> <li>The most common worry regarding the beginning of a new semester is if students can <b>keep up with the lectures/reading and manage their time</b> (53%), as well as how they will perform at their exams (11%) or if they will be able to handle the new/danish education system (9%).</li> <li>Students know <b>which materials/books</b> they should get directly from their <b>teachers</b> (74%), from the course site (63%) or former/current students (23%).</li> <li>Around half of the students get/buy their books after hearing <b>how relevant the books are</b> (47%), while 28% get them after they see the reading list. Only 18% buy the books the moment they have to use them.</li> <li><b>Price</b> is the main factor that affects the students when buying their books, followed by teachers' recommendations, other students' recommendations and familiarity with the retailer.</li> <li><b>78% of students courses require books</b>, 64% articles and journals, 61% of students have compendiums and 34% need video/audio materials.</li> <li>66% of students <b>prefer Physical books over E-books</b> 34%. The best part about E-books is that everything in one place (17/34). On other hand physical books are better for the eyes (19/66), easier to mark content in (highlights/notes)(16/66) or easier to understand (15/66).</li> <li><b>60% of all students admitted they use pirated content</b> during their education. 40% pirate less than half of their books, while only 26% pirates more than half.</li> <li>According to the interviewees, 52% are willing to pay 100 - 150 DKK for a subscription, 21% could pay 150 - 200 DKK, 13% around 50 DKK and only 8% can afford to pay 200 - 300 DKK.</li> </ol>	<ol style="list-style-type: none"> <li>Most participants (88%) agree that working with other students is beneficial.</li> <li>The most common tools used by students when collaborating together are <b>Google Drive</b> (55%), Facebook/Messenger ( 21%) and Face-to face/study group work (17%).</li> <li>72% interviewees <b>use content created by other students</b>. 23/40 use old exams/reports and 12/40 use other students' notes.</li> </ol>	
<b>The study process</b>	<b>Exam period</b>	
<ol style="list-style-type: none"> <li>78% of students <b>study at home</b>, 36% use the library, 24% read in the university and 21% prepare while travelling.</li> <li>While reading their content, 87% of students use their <b>computers</b>, 74% use <b>physical books</b> and 17% use their tablets/iPads.</li> <li>Students look for their mandatory materials (articles, journals, etc.) in <b>Google (scholar)</b> (49%), in (Online) Library / Database (41%) or find them on their LMS (25%).</li> <li>When searching for additional materials students search on <b>Google (scholar)</b> (76%) and in (Online) Library / Database (34%).</li> <li>52% of the interviewees would prefer getting their content in parts, 29% want to have the whole content and 15% think it depends on the context/ subject.</li> <li>The media that helps students understand their subject better is <b>Videos</b> (82%), followed by Text materials (72%) and Audio (17%).</li> <li>The most common methods student use to study are <b>notes</b> (physical/digital) (66%), highlights (41%) and tools to help them manage their time/tasks (14%).</li> <li>Students use different additional tools while studying - <b>Written materials/content</b> (36%), Specialized software (30%), Videos (30%) and Audio content (7%).</li> <li>45% of students think citation is important, 22% disagree, 21% think it depends on the assignment and 13% haven't used Citation so far.</li> </ol>	<ol style="list-style-type: none"> <li>The ways students prepare for exams are by <b>reading through their materials</b> (47%), reading/making notes (45%) or practicing ( exercises/ exams/assignments) (21%).</li> <li>The most common exam type is an oral examination (22/40), followed by report writing (15/40) and written examinations (11/40).</li> <li>During examinations, students can use <b>notes/highlights</b> (69%), books (26%) or are not allowed to use any materials (24%).</li> <li>The biggest issues before exams are <b>nervousness /stress</b> (41%), <b>managing time</b> (30%) and knowing what is most relevant (10%).</li> </ol>	
	<b>Conclusion</b>	
	<ol style="list-style-type: none"> <li>37% students buy more than half or all of their books, and use most/all of them. ( 18/37 of them are buying all books and using them all) 17% buy less than half of their books ( what is relevant, necessary) and end up using most/all of it.</li> <li>The biggest issues student face during the semester are managing their time (27%), uneven or overwhelming workload (19%) and bad lectures/teachers/materials (8%).</li> <li>According to the students, in order to be more efficient they need a task/time management tool (19%), practical projects or examples (9%), efficient note taking program/structured reading (7%) and having everything accessible / in one place (7%).</li> <li>A smart study tool should be a task/time tracker (18%), has to have everything in one place and be accessible (15%) and provide easy/ accessible notes and highlights (12%).</li> </ol>	

## Appendix 2: Student interview question

### INTERVIEW QUESTIONS:

**Introduction:** Position in the company, reasons for the interview.

#### General Information:

1. What is your age?
2. What is your nationality?
3. Which University do you attend?
4. What degree are you currently in? (Master, Bachelor, other)
5. What is your education line?
6. Which one of these describes you the best:

I read the suggested books and find extra materials that are relevant to my studies

Only read particular chapters that are part of the curriculum and I rely on my notes from lectures.

I only read the slides and I search in Google/ Wikipedia about the most important things

7. What kind of learning type are you? (Multiple Choice)

Visual	Logical	Auditory
Verbal	Physical	Social
Solitary		

8. What are your biggest worries regarding the beginning of the new semester

#### The study process

1. What do you like while learning? What keeps you motivated?
2. What are your small successes / milestones along the way?
3. What challenges do you face when studying? (Material, fellow students, lecturers, etc.)
4. When and where do you usually study or use your books?

5. What do you use when you read your content. ( phys.book, computer,iPad,E-reader)
6. What tools do you use when studying besides your books/compendium? Are there specific tools/program/software related to your education?
7. What do you do when you have problems understanding your material?/ (What do you do, when there's a paragraph/section you do not understand?)

#### Collaboration

1. Is it beneficial to work with other students?
2. What tools do you use to collaborate with other students? How do you use them?
3. How do you work together with your fellow students? When you have to do group work, do you use the study material? How? Why? Why not?

#### During Exam Period

1. How do you prepare for exams?
2. What are the biggest issues you face before exams?

#### Conclusion

1. What are the biggest issues you encounter during the semester?
2. What would help you to enjoy your studies more?
3. What could help you to be a more effective student?
4. How do you imagine a "smart study tool" could help you?

## Appendix 3: Student interview answers

General students interviews analysis		Test Description
<b>Objective of the test</b> Understand who are our potential users: the students. Find what are the students needs and pains. Understand what could be done to improve their way of studying and help them achieve their best.		Interviews were conducted with 18 students from different universities and educations.  The interview started with general questions about the students, their education and learning style.  In order to understand their mindset we asked them a series of questions focused on their study process: how do they study, what do they use while doing so and what challenges do they have while doing so.
<b>Date</b> Conducted during fall semester of 2018		their fellow students.  Another important area for us to explore was the exam period the students were asked how do they prepare for exams and what issues they encounter while doing so.  As a conclusion we asked a series of questions about their pains during their education and what could help them have a better experience at the university.
Findings		
<b>General information:</b>		
<ol style="list-style-type: none"> <li>1. <b>Age group:</b> 18 - 27 years.</li> <li>2. <b>Gender:</b> 7 male, 11 female</li> <li>3. <b>Nationality:</b> <ul style="list-style-type: none"> <li>• Danish (7/18),</li> <li>• Hungarian (2/18)</li> <li>• Indian (2/18)</li> <li>• Greek (2/18)</li> </ul> </li> <li>4. <b>Universities:</b> <ul style="list-style-type: none"> <li>• CBS (6/18)</li> <li>• KEA (4/18)</li> <li>• DTU (3/18)</li> </ul> </li> <li>5. <b>Degree:</b> Masters (11/18) Bachelor (7/18)</li> <li>6. <b>Educations:</b> <ul style="list-style-type: none"> <li>• Economics</li> <li>• Visual communication</li> <li>• Autonomous systems</li> <li>• International marketing &amp; communications</li> <li>• International business and politics</li> <li>• Engineering management</li> </ul> </li> <li>7. <b>Learning styles:</b> <ul style="list-style-type: none"> <li>• I read the suggested books and find extra materials that are relevant to my studies: (7/18)</li> <li>• I only read particular chapters that are part of the curriculum and I rely on my notes from lectures: (11/18)</li> </ul> </li> <li>8. <b>Learning types:</b> <ul style="list-style-type: none"> <li>• Visual (12/18)</li> <li>• Social (10/18)</li> <li>• Logical (7/18)</li> </ul> </li> </ol>	<ul style="list-style-type: none"> <li>• Romanian (1/18)</li> <li>• Bulgarian (1/18)</li> <li>• Italian (1/18)</li> <li>• Czech (1/18)</li> <li>• AAU (2/18)</li> <li>• RUC (1/18)</li> <li>• KADK (1/18)</li> <li>• Management of creative business processes</li> <li>• Wind energy</li> <li>• E-business</li> <li>• Multimedia design</li> <li>• Strategy and organisation</li> <li>• Communication and business studies</li> </ul>	<ol style="list-style-type: none"> <li>9. <b>What are your biggest worries regarding the beginning of the new semester?</b> <ul style="list-style-type: none"> <li>• Managing time &amp; Workload (10/18)</li> <li>• Foreign students are worried what to expect from the danish education (3/18)</li> <li>• Would the subject be interesting/ enjoy the education (2/18)</li> <li>• How to apply their skills? What happens when their education finishes? (2/18)</li> <li>• Teaching &amp; environment (1/18)</li> <li>• Exams (1/18)</li> <li>• Socialising + fitting in (1/18)</li> </ul> </li> </ol>
<b>The study process</b>		
<ol style="list-style-type: none"> <li>1. <b>What do you like while learning? What keeps you motivated?</b> <ul style="list-style-type: none"> <li>• Motivating/good books, lectures, teachers, groups (11/18)</li> <li>• Achieve their dreams/ feature (6/18)</li> <li>• Achieve goals, be prepared (3/18)</li> <li>• Your results/ be the best (2/18)</li> <li>• Learning from others (2/18)</li> <li>• Easy access to info (1/18)</li> </ul> </li> <li>2. <b>What are your small successes / milestones along the way?</b> <ul style="list-style-type: none"> <li>• Passing exams/courses (8/18)</li> <li>• Learning (7/18)</li> <li>• Enjoying it (2/18)</li> <li>• Grades (2/18)</li> <li>• Experience/practise (3/18)</li> </ul> </li> <li>3. <b>What challenges do you face when studying? (Material, fellow students, lecturers, etc.)</b> <ul style="list-style-type: none"> <li>• Keeping up with materials (7/18)</li> <li>• Not understanding content/ tasks (5/18)</li> <li>• Bad/complicated material (3/18)</li> <li>• Finding the right materials (3/18)</li> <li>• Bad group work (2/18)</li> <li>• Deadlines (2/18)</li> </ul> </li> <li>4. <b>When and where do you usually study or use your books?</b> <ul style="list-style-type: none"> <li>• Home (12/18)</li> <li>• Uni (9/18)</li> </ul> </li> <li>5. <b>What do you use when you read your content. ( Physical book, Computer, iPad, E-reader)</b> <ul style="list-style-type: none"> <li>• Laptop (14/18)</li> <li>• Physical book (9/18)</li> <li>• Phone (4/18)</li> </ul> </li> </ol>		
<p><i>"Visual types remember better using colours and pictures. They like to colour code their information. Videos are also helpful for this learning type."</i></p> <p><i>"Physical types learn by putting their knowledge into practise. They like to test their cases or what they have learned."</i></p> <p><i>"Social learning helps learn more, get additional ideas, get help with topics, be more motivated &amp; validate your ideas."</i></p> <p><i>"Learning the base of a subject works only in solitary."</i></p>		
<ul style="list-style-type: none"> <li>• Latvian (1/18)</li> <li>• German (1/18)</li> <li>• ITU (1/18)</li> </ul>		
<ul style="list-style-type: none"> <li>• Being published, appreciated (2/18)</li> <li>• Make notes (1/18)</li> <li>• Group Work (3/18)</li> <li>• None: "Uni is boring" (1/18)</li> <li>• Lack of motivation (2/18)</li> <li>• Culture is different (2/18)</li> <li>• Grades (2/18)</li> <li>• Program/course is too slow (1/18)</li> <li>• Sharing files/work on the same report (1/18)</li> <li>• Cannot highlight in articles (1/18)</li> </ul> <p><i>"The books are too big and complicated, so I find summaries from Aspire (DK)"</i></p> <p><i>"First semester was the worst" - foreign student ( different cultural, expectations, unclear teaching)</i></p> <ul style="list-style-type: none"> <li>• While traveling (7/18)</li> <li>• Library (5/18)</li> <li>• Pen block ( for drawing) (1/18)</li> <li>• Headphones (1/18)</li> </ul>		

**6. What tools do you use when studying besides your books/ compendium? Are there specific tools/program/software related to your education?**

- Office pack/ Latex/ Drive/ Oenote (7/18)
- Visualisation softwares (Adobe, Caa) (4/18)
- Economics: Sas Jmp, EconLab,etc) (2/18)
- Physical visualisations (notes whiteboard) (2/18)
- Aspir ( before exams, watch their videos) (1/18)
- Portal for sharing ( exams, notes, books ( started by students)) (1/18)
- Pen to write graphs and math problems with (1/18)
- Business cases ( students pay for them) (1/18)

**7. What do you do when you have problems understanding your material? (What do you do, when there's a paragraph/section you do not understand?)**

- Ask classmates (13/18)
- Ask teachers (10/18)
- Check online (8/18)
- Find additional content (3/18)
- Read in own language (2/18)
- Find reviews (1/18)
- Ask friends (1/18)

**Collaboration**

**1. Is it beneficial to work with other students?**

- Yes (10/18)
- No (0/18)
- Sometime (7/18)

**Yes:**

- Learn from others (6/10)
- Different perspectives (5/10)
- Students divide their work (1/10)
- Fun (1/10)
- Others can learn from you (1/10)
- If there is structure, you get, good outcome (1/10)

**Both:**

- It can be difficult (3/7)
- Not with exchange students (1/7)
- If the students are at the same level/ have the same motivation, then it is beneficial (1/7)

**2. What tools do you use to collaborate with other students? How do you use them?**

- FB/messenger (12/18)
- Google drive (11/18)
- Meeting in person (3/18)
- Video calls (1/18)
- Trello (2/18)
- Slack (2/18)
- Asana (1/18)
- Evernote (1/18)
- Real time board (1/18)
- Sharelatex (1/18)
- Dropbox (1/18)
- Whatsapp
- mail (1/18)
- Conflict management tools (1/18)
- Weshare (1/18)
- Heard\* (1/18)

\*CBS online platform to do projects together

**3. How do you work together with your fellow students? What materials/ tools do you use?**

- Don't use materials/books (10/18)
- Discuss together (10/18)
- Do/write projects together (through Drive) (7/18)
- Use Books/study materials (5/18)
- Split their work/tasks (4/18)
- Make notes together (3/18)
- Read together (2/18)
- Use whiteboard (2/18)
- Notes (1/18)
- Collaboration tools (1/18)
- Put knowledge in practise (1/18)

**During Exams Period**

**1. How do you prepare for exams?**

- Read/make notes (6/18)
- Read summaries (6/18)
- Read specific topics/ chapters (5/18)
- Read/make highlights (5/18)
- Study/read everything (3/18)
- Discuss with others (3/18)
- Make/follow a reading plan (3/18)
- Do exercises (3/18)
- Check old exams (2/18)
- Read slides (2/18)
- Learn presentations by hearth (1/18)
- Check headlines, pics, bold text (1/18)
- Watch Youtube videos (1/18)
- "Read summaries in Aspir" (1/18)

**2. What are the biggest issues you face before exams?**

- Stress (8/18)
- Time (8/18)
- What is the most relevant, so they can study that (3/18)
- Not reading enough (2/18)
- The language (1/18)
- Lonely process (1/18)
- What are the requirements (1/18)
- Task management (1/18)

**Conclusion**

**1. What are the biggest issues you encounter during the semester?**

- (Time) manage everything (4/18)
- Understand everything, so they can follow the course (2/18)
- Lack of motivation (2/18)
- Lack of practical assignments (1/18)
- Exam amount (1/18)
- Exam stress (1/18)
- Group work (1/18)
- Adapting to new courses (1/18)
- Feel welcome at Uni (1/18)
- Know they are studying the right thing (1/18)
- Keep materials together (1/18)

**2. What would help you to enjoy your studies more?**

- Intro: how to study (2/18)
- Everything in one place (1/18)
- Plan better (1/18)
- More information between current/former students (1/18)
- Videos in lectures (1/18)
- Clear requirements (1/18)
- Be able to highlight in texts & find fast at exams (1/18)
- Feel welcome at school
- Good relationship with other students (1/18)
- Get only chapters (1/18)
- Offline materials (1/18)
- One-on-one with teachers (1/18)
- Reward system/ acknowledge when they have done better than others (1/18)
- Programs that allows to draw graphs during class (1/18)
- Learn more about the field (1/18)
- Challenges (1/18)

**3. What could help you to be a more effective student?**

- Prioritising /time management: (4/18)
- Good team work (2/18)
- Challenges/contest (2/18)
- More visual materials / courses (2/18)
- Additional materials/tasks (1/18)
- LMS with everything inside (1/18)
- More classes (1/18)
- Be able to share with others (1/18)
- Motivational teachers (1/18)
- Practical projects (that can be used in the field) (1/18)
- Small study groups(1/18)
- Smaller assignments (1/18)
- Reminder of their main / end goal (1/18)

**4. How do you imagine a "smart study tool" could help you?**

**Smart Study Tool:**

Discord + LMS + FB + Google + Oenote + PDFs +Books +Past exams + Student content + Lix + Add own files + Videos + Content from teachers + Forum + Share

- All programs / tools in one place (6/18)
- Collaboration tool ( brainstorm, conflict management tools) (3/18)
- Allow personalised visualisation, colour coding (3/18)
- Provide reading recommendations (2/18)
- Download/offline books (2/18)
- High quality ebooks (2/18)
- User friendly platform (2/18)
- Share with others (2/18)
- Task management/schedule tool (2/18)
- Allow easy notes/highlights (1/18)
- Searching function (1/18)
- Pen (allowing to write on the computer) (1/18)
- Efficient tool at exams (1/18)
- A tool that answers questions(1/18)
- Provide videos of lectures (1/18)
- Should allow to turn off other students highlights (1/18)

# Appendix 4: Cards ( Cardsorting activity )



# Appendix 5: Co-creation findings ( Presentation )

**Co-creation workshop**

- 7 participants
- 4 stage: Individual & Group cardsorting, Prototype and Gamification

**2 solutions:**

- Responsive PA
- Time to read feature

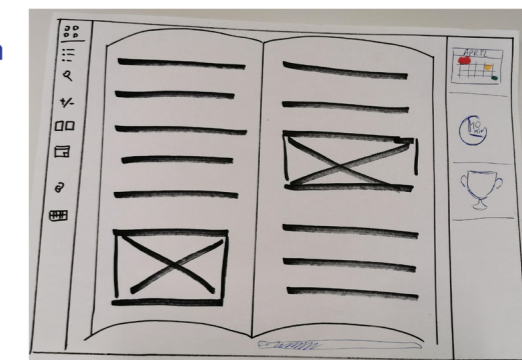
**Student insights**



**Students hierarchy of pain points:**

1. Motivation
2. **Time & Task management**
3. Workload
4. Organization
5. Content understanding

**Solution**



**Components**

**Main component:**

- Time the amount of reading required for class

**Secondary components:**

- Recieve points, awards, levers/trophies
- Progress bar of your success
- Setting a deadline - Colour changing notification
- In-app Calendar

**Your input**

- What is possible?
- Minimum & Maximum
- When can it be implemented within the Lix app?

# Appendix 6: Prototype question guidelines

## QUICK AND DIRTY PROTOTYPE TEST:

**Intro:** Thank the student for taking the time to do the text:

### **Explain about the test:**

- The student pain points and needs during their education
  - What is Lix, how does it work. Show the existing application.
  - What is a quick and dirty prototype
1. What is the biggest issues you have while studying?
  2. Do you have problems keeping up with the school workload? Reading workload?

*Explain the idea of the new Lix feature - time to read. Give the tester time to interact with it and try it out.*

3. Do you like the feature?
4. What benefits will it bring to you while studying?
5. Is there anything more you would like to see?
6. Do you like the badges? Would they help your motivation?
7. Is it a feature you would use while studying?