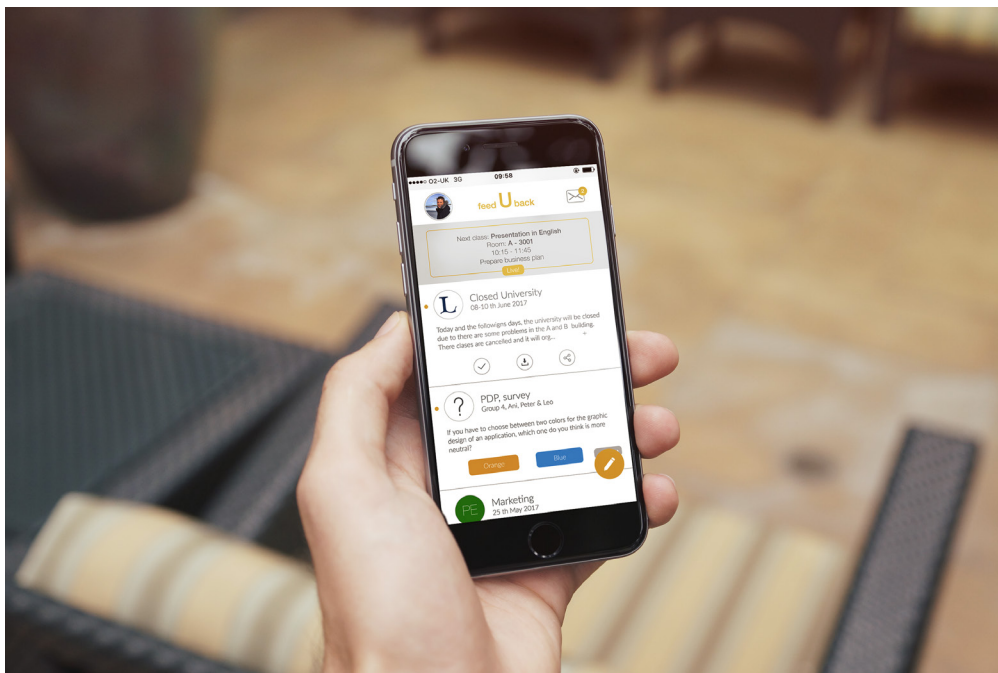


Service & Interaction Design

*Improving the University Learning Experience service design of a framework
for learning*



Paula Tomás Malón

**Industrial Design Engineering, master's level
2017**

Luleå University of Technology
Department of Business Administration, Technology and Social Sciences

Service & Interaction design

Improving the University Learning Experience
service design of a framework for learning

PAULA TOMÁS MALÓN

2017

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It is been a pleasure for me and this experience has helped me a lot not only academically but also as a person.

Paula Tomás Malón
Luleå, June 2017

Master of Science Thesis
Service & Interaction design
Improving the University Learning Experience service design of a framework for learning

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ABSTRACT

Nowadays, the experience that the students have in the university is not as productive or successful as it could be. We spend a big part of our life studying with the objective of in a future, have enough knowledge to develop a professional activity. But, how much of this knowledge that we learn during our studies are useful in our personal and professional lives? Is the education only a formality to obtain an academic transcript, which let us take part in the labour market? Are really oriented the university degrees to help us in the development of our personal and professional skills?

The goal of this project it's to create or improve the service that the university offers to us, to obtain a better learning experience. As an Industrial design engineering student my aim and objective is to create a service that solves the necessities and problems of the users in the academic field. Some of the main problems are: memorise instead of internalise, limit the education to the theory knowledge, lack of motivation, bad communication between teachers and student.

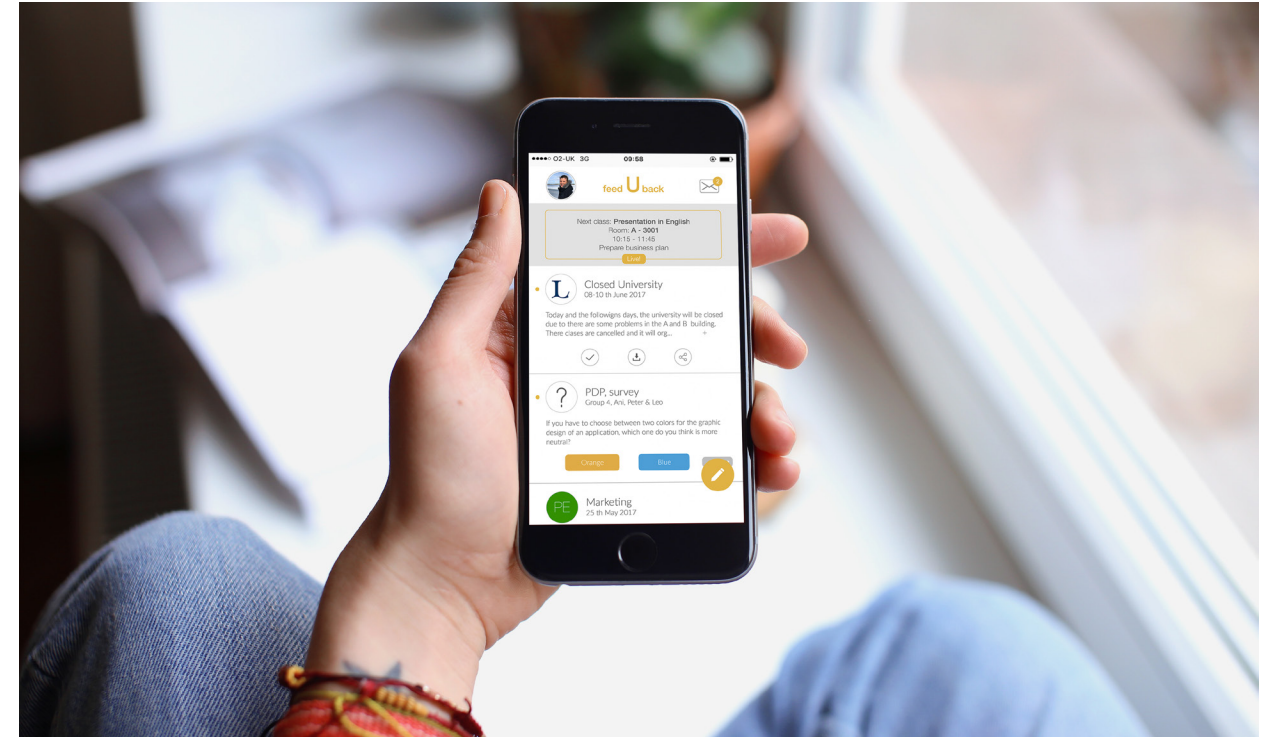
For the first part of my project I perform and study about all the fields that can influence somehow in the academic area. From that study I could take the main problems and necessities that the users have nowadays and later on start the ideation to develop solutions for those pro-

blems found. The last part was the development of the chosen idea and the realisation of the user's tests that help me to improve the final result.

The result is a new learning methodology which is complemented with a mobile application. The methodology is composed by four types of lessons, in which the students will develop their personal and professional abilities as well as the knowledge. The mobile application keep informed both the teachers and the students about what is going on in the university and also the news on their courses. Apart from that it provides a faster way of communication between teachers and students and also a new form of obtaining feedback.

The results of this project show that is possible face the learning experience in an innovative way which is also easy to implement. Thus, the educational problems can be solved and the necessities covered, achieving a more productive and successful university experience.

KEY WORDS: Student, teacher, method, methodology, experience, university, learning, teaching.



ABSTRACTO

Hoy en día la experiencia que tienen los estudiantes en la universidad no es tan productiva ni exitosa como podría llegar a ser. Dedicamos gran parte de nuestras vidas a estudiar, con el objetivo de, en un futuro tener los conocimientos necesarios para desarrollar una actividad profesional. Pero, ¿cuántos de esos conocimientos que nos esforzamos en aprender durante nuestros estudios realmente nos son de utilidad en nuestra vida laboral y personal? ¿Se ha convertido la educación en un mérito trámite con el fin de conseguir un diploma que te abra las puertas al mercado laboral? ¿Realmente están orientadas las carreras universitarias a ayudarnos en el desarrollo de nuestras habilidades personales y profesionales?

El fin de este proyecto es crear o mejorar el servicio que nos ofrece la universidad para llegar a tener una mejor experiencia de aprendizaje. Como estudiante de ingeniería de diseño industrial y desarrollo de producto, mi misión y objetivo es crear un servicio que resuelva los problemas y necesidades de los usuarios en el ámbito académico. Algunos de los principales problema son: memorizar en vez de interiorizar, limitar la enseñanza al conocimiento teórico, falta de motivación, mala comunicación entre alumnos y profesores...

La primera parte del proyecto se centró en realizar un estudio sobre todos los campos que pueden afectar de algún modo al ámbito académico. A partir de este estudio pude extraer las principales necesidades y problemas que tienen los usuarios hoy en día, para más tarde comenzar la fase de ideación y desarrollar soluciones para las necesidades y problemas encontrados. La última fase fue el desarrollo de la idea seleccionada y la realización los test de usuario que me ayudaron a mejorar el resultado final.

El resultado es una nueva metodología de enseñanza que se complementa con una aplicación móvil. La metodología, se centra en la combinación de cuatro tipos de clases, en las que se llevan a cabo diferentes actividades que ayudan a desarrollar las habilidades personales y profesionales además del conocimiento. La aplicación móvil mantiene informados tanto a los profesores como a los alumnos de lo que pasa en la universidad y de las novedades de sus cursos. Además proporciona una manera rápida de comunicación entre profesores y alumnos y una nueva forma de obtener feedback.

Los resultados del proyecto demuestran que es posible enfocar la experiencia de aprendizaje de una manera innovadora y de fácil implementación. Solucionando los problemas y cubriendo las necesidades con el fin de conseguir una experiencia universitaria productiva y exitosa.

KEY WORDS: Estudiante, profesor, método, metodología, experiencia, universidad, aprendizaje, enseñanza.

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INTRODUCTION

01



INTRODUCTION01

This master thesis report details a design project concerning improving the learning experience in higher education. The overall objective of the current project is designing new learning tools and improving the communication and interaction between teachers and students. The master thesis project is performed in Industrial Design Engineering (D7014A), at Luleå University of Technology. It covers the Spring semester of 2017, around 20 weeks, corresponding to 30 hp.

1.1 PROJECT STAKEHOLDERS

The primary stakeholders of this project are the areas of Industrial design at Luleå university of Technology (LTU), and Industrial design at the University of Zaragoza (UNIZAR). These two are the main driving forces behind the project's initiation, and play an important role in the design process. The project team consists of one student, the author of this report, my LTU supervisor and other two co- supervisors from my home university. (UNIZAR)

University of Zaragoza has other learning program for its students than Sweden. All the courses, or the most of them, have the same structure, the duration is about 5 months and they have a lot of theoretical classes, some practice classes with projects and a lot of exams. The learning tools that we use are similar during the degree, that after three or four years you don't have the enough motivation to develop a new project or to finish your thesis. This is one of the main reasons that this university needs something new.

We have to recover the desire of learning

Additionally the users, in other words, the university students at UNIZAR and LTU, also play an important part in this project, since they represent the target group for the design of learning tools.

1.2 PROJECT OBJECTIVES AND AIMS

The overall project objective is to design a new service to improve the university learning experience. The project aim is to enhance the experience for both students and teachers by improving their work- and learning environment, contributing to motivation, and introducing new and innovative learning tools.

This includes providing a new approach for university education, by comparing the current learning tools and methods, communication relations, work- and learning environments etc. with both Sweden and Spain, and with current research and development work.

My own objectives are to acquire new knowledge about methodologies and Service design tools and learn how to apply them. My perspective of learning is that we can learn in many different ways, not only by traditional studying, doing exams, develop projects etc. We can also learn from each other, through asking, traveling, in meetings, congresses, courses, talks, student interaction, and last but not least, through making mistakes.

Thus, I want to develop a framework for learning that is different from everything that already exists

1.3 RESEARCH QUESTIONS

In order to develop a successful service, to solve identified problems and meet user needs, the design process needs to be grounded in relevant research. This means that the research questions that are intended to be answered in this project are based on different aspects. The first aspect concerns the current situation at the university, how students and teacher experience learning, how they currently perform learning, and what research state as good learning. In order to achieve this, a literature review and benchmark have to be performed, about the current situation at both LTU and UNIZAR and perform a literature review about service design and learning experience.

The second aspect concerns how it ought to be: if there are new methods, new ideas, existing solutions, which solve the identified problems and challenges. The third and last aspect concerns the users. The user plays a key role in the design of a new service, since it is they who will use it daily. For this reason, I have to look into usability and user experience, and how to design a service that contributes to a good learning experience.

Different questions have been raised for the research of this project, these questions are:

- How can service design inform and contribute to a better university learning experience?
- What is service design?
- What is a good learning experience?
- What is the current learning experience at LTU and at UNIZAR?
- How would an ideal learning framework ought to be?
- What solutions (methods, ideas, tools etc.) exist today?
- What are the pros and cons of these solutions?
- How can the user experience be improved at LTU and UNIZAR?

1.4 PROJECT SCOPE


The work includes 20 weeks of full time studies, is equal to 30 Swedish university credits and comparable to 800 working hours. The objective is to create a service to solve the problems that the students have, improved their experience at the university is the main scope of the project.

This project started like a proposal of my Spanish university, now I am developing it in Lulea, Sweden. The purpose is to take the best Swedish characteristics in different areas like academic, the relationship between teachers and pupils... and reflect them in my final project. But moreover, I will do some global propose about the design education and pedagogy.

1.5 THESIS OUTLINE

The first chapter in this thesis contains an introduction to the project and its objectives and aims. The second chapter includes a theoretical framework, which covers areas about service and graphic design, design education, learning tools and user experience. It will also present research about design pedagogy and some text fragments that are so interesting to develop and understand this project. In the following chapter I present the methods and implementations that I have done during the project.

Next, the results, as the name says this chapter explain the different results that we have obtained during the research, the ideation and the prototyping. The last two sections are: discussion and conclusion. These sections cover the reflection about the result and the contribution of this project as well as answering the researches questions. Illustration and posters have been used for communication and presentation during the process. These will be presented in the appendixes section at the end of this report.



THEORETICAL FRAMEWORK 02

THEORETICAL FRAMEWORK02

In this chapter, I present relevant research about service and graphic design, design education and learning tools, topics that are the framework for the project. The chapter also contains theory about design pedagogy and other results of the literature study performed.

2.1 SERVICE DESIGN

While the word design generally is used to refer to the appearance of styling of a particular product or outcome, the proper meaning goes far beyond that (Stickdorn & Schneider, 2011). In this view, the approach of service design refers to the process of designing rather than to the design outcome. The outcome of a service design process can have various forms: rather abstract organisational structures, operation processes, service experiences and even concrete physical objects (Stickdorn & Schneider, 2011).

Frankly, one of the great strengths of design can be just that we in the design community have not settled on a single definition. Buchanan (2001) for example says that in fields that by definition now are considered as “settled”, “lethargic”, “dying or dead, inquiry no longer provides challenges to what is accepted as truth. Hence, by not having a single clear definition of service design might just mean that it is an upcoming field, with plenty of new challenges. A result of not having a definition on the other hand is that if you ask ten people what service design is, you would probably end up with eleven different answers at least (This is service design thinking, 2015, pg 29).

Service design is an interdisciplinary approach that combines different methods and tools from various fields. It is a new way of thinking as opposed to a new stand-alone academic discipline (Stickdorn, 2011).

A single definition of service design might constrain this evolving approach, whereas a shared language is undoubtedly important for the further growth and development of service design thinking. Therefore, this is service design thinking strives to propose the basis for a common language of service design. With this intent, Stickdorn 2011 has collected different definition about service design, the combination of various examples and attempts to define service design. I have chosen one, which is for me one of the clearest definitions. (lower part)

“A lot of innovations fail because they simply don’t fulfil the needs of people. Therefore the innovation of services within Service Design starts by understanding people. Through the connection with business and technology, you end up with services that are not only profitable and feasible but also truly meaningful for people.”

(31 VOLTS Service design, why service design works, 2017)

Nowadays we live in a world that we can choose which service we want because; there is more than one kind of hotels, cinemas, houses, restaurants, universities... The reason between take one or the other is the way that you feel when you use them.

“I’d argue that service design is the most important design subspecialty in the business world today.”

Kerry Bodine, VP & Principal Analyst, Customer Experience, Forrester Research

“When you have two coffee shops right next to each other, and each sells the exact same coffee at the exact same price, service design is what makes you walk into one and not the other”

(31 VOLTS Service Design, 2008)

2.2 USER EXPERIENCE

A designer can listen to what people say about a product or a situation and observe what users do in a given situation, but how do designers understand what the users really feel about a product? The idea of understanding the user’s experience of a product was born in the mid-90s at Apple, and the term User Experience was invented (Henderson, Miller & Norman, 1995).

To be able to understand the user needs in term of opinions, behaviour and emotions, students need to understand the difference between these perspectives and find appropriate methods for each of them (Sanders, 2002).

2.2.1 Learning experience

Over time, we learn more from experience than from books. This is obvious, but when we are in the school or university periods sometimes we focus on studying, doing exams, making works, and nothing more. We should consider that there are infinities ways to learn. (Picture 1).

Learning experience design (LX Design) is the process of creating learning experiences that enable the learner to achieve the desired learning outcome in a human centered and goal oriented way. Now let’s break things down into smaller parts: experience, design and learning. These parts are quite self-explanatory and together they tell a lot about what LX Design really is about.

Everything we learn comes from experience. An experience is any situation you encounter that takes an amount of time and leaves an impression. These experiences don’t necessarily have to take place in an educational setting like a school. They can take place at home, outside, in the office or anywhere else.

Not every experience is as educational as the next. Some experiences can be straight out boring or annoying. Fortunately, we’ve all had experiences that were very educational and that will last a lifetime. Being able to design such powerful experiences is the main quality of a good LX Designer.

LX Design is a design discipline. You want to be able to think and work like a designer. This means using a design process that typically includes research, experimentation, ideation, conceptualization, prototyping, iteration and testing. It is not a step by step systematic process but a creative process with an outcome that’s uncertain at first and crystal clear in the end.

Just like in any other design discipline, LX Designers use a mix of creative, conceptual, intellectual and analytical qualities to come up with elegant solutions that work. The main difference with other design disciplines is the fact that your design serves a purpose to learn.

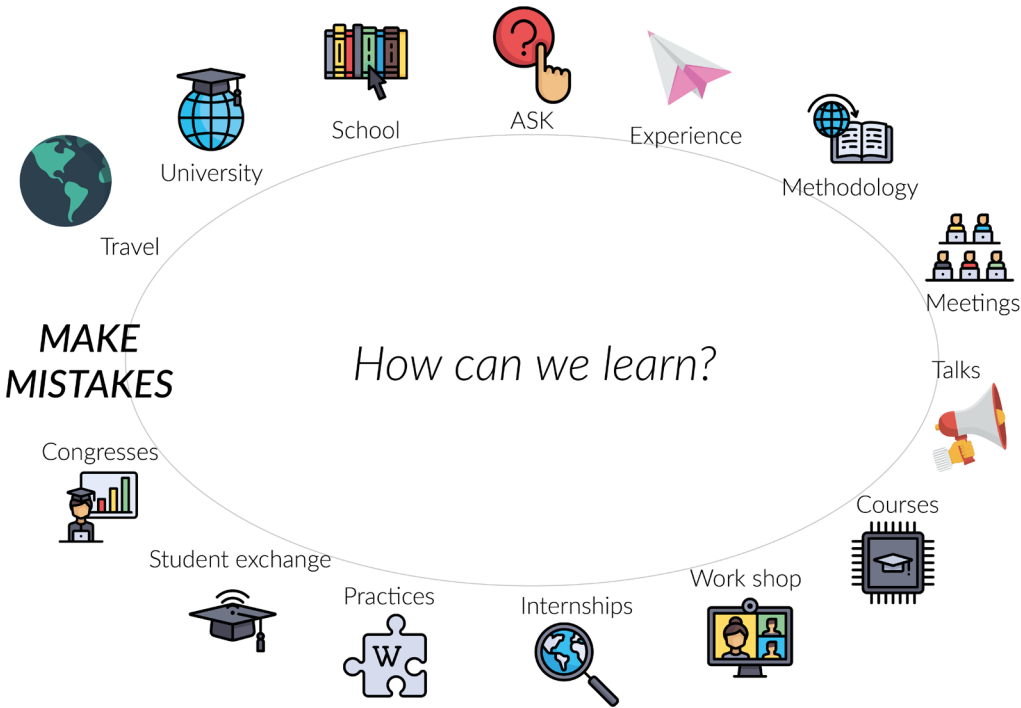


Figure 1 - Types of learning

LX Design is about learning and not so much about teaching, instruction or training. The focus is where it should be: on the learner and the process that the learner goes through. You definitely have to understand why and how people learn in order to be effective. Experiential learning in particular is part of the foundation of LX Design.

Learning experience design (LX Design) is the process of creating learning experiences that enable the learner to achieve the desired learning outcome in a human centered and goal oriented way.

As stated in the definition, It want to design a learning experience that enables the learner to reach the desired outcome. But how can we do that? By making the experience human centered and goal oriented.

2.3 HUMAN CENTERED

Learning is a human and preferably social process. Putting the learner at the center of your design process is called human centered design. This is an important part of how and why LX Design works. This means you have to get to know and understand the people you design for. You want to figure out what drives them and how you can ignite their intrinsic motivation. That's why getting in touch with your target audience through inter-

views, observations and co-creation is indispensable. People are both rational and emotional beings. We all have wants, needs, hopes, fears and doubts. So a great learning experience has to connect on a personal level. To do so, being able to distinguish and act upon differences between groups of learners and even individual learners is key.

A learning experience will make no sense if you don't reach your goals. Choosing and formulating the right goals is an important part of designing a learning experience. This can be quite a challenge, depending on the scale and complexity of the experience that you are designing. Coming up with activities that enable the learner to actually reach specific goals is what separates a good LX Designer from a great one. That's where a thorough and innovative approach, like working with the learning experience canvas, can really make a difference.

One very important aspect of LX Design is what form, medium or technology you choose for a learning experience is primarily based on the goals of the learner. This means you start with formulating the desired learning outcome and every next step in the design process, including the choice of your medium or technology, is geared towards the desired learning outcome. Besides, we should also know that making pressure or creating competition among students is not good... It is very common to compare the projects, results between them but do you think that this is correct? Each student is exactly the same than his/her classmates? The problem is that they want to win instead of learn...

To conclude this chapter I have made a graphical summary so as not to forget all the important aspects that the user experience has. Thinking about when to develop the concepts and the final design.

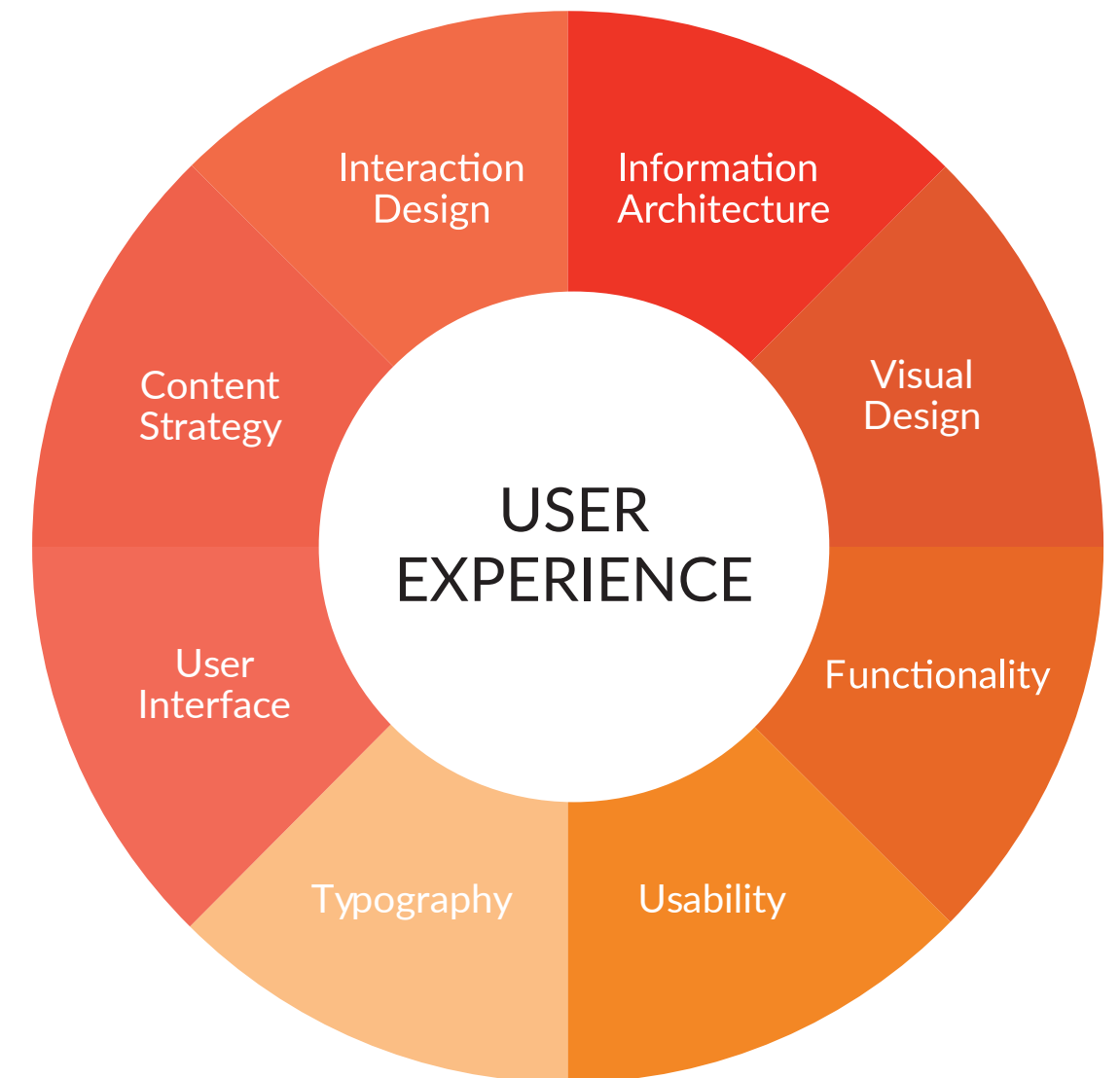


Figure 3 - User experience aspects



Figure 2 - Learning experience

2.4 DESIGN EDUCATION

Who is, or has once been a student? Most of us probably all have some kind of a learning experience with us, which largely define and determine our professional activity. In the creative areas, this topic is one of the most complexes, for this reason I will strive to explain different factors that are a part of a design education. In general, education is made up of two opponents: one student and one teacher. In my perspective, throughout our life we have to keep on to be students, since we live in a world that are in a constant change and transition, where information (real or fake) flows on the net. As design student, we have to take into consideration that today; everyone can be a designer, with or without training. As designers, we have to keep learning and developing, we cannot be obsolete.

Jaume Pujagut discovered that the students in a school of graphic design in North America had done some incredible projects, in his view with a higher level than any Spanish or European student. They were graphic professional's designers, who had left their work temporally to return to study and update their knowledge. By this I wish to say that although we usually study during 4-5 years in the university, design is an area which you need to keep on studying. Life change very quickly, the world develops, humanity evolves and the needs change too. That's why, although a model of life has already been established, first we have to study (universities, collages...) and after work hard the rest of our lives, it has to change. It would be perfect if we could study and work at the same time, or if we work during 6 years and then we could take one year only to study and re-forming again. It could be a good way for renewal of knowledge.

Design never stop form us,
we have to stay update and
always be concurrent

Other reason to change the learning and teaching tools is one that Doug Powell (2015) explains; "Graduates who come to IBM are not sufficiently prepared, not at least as we would like it... For example, we detected shortcomings when they have to work as a team and when it comes to developing storytelling". However the type of education those design' students receive and other student of different degrees are more theoretical than practical, same as life is more practical than theoretical. Why they insist on teaching subjects with a theoretical load higher than the practice, if after, when they go out to the labour market, they have the feeling that they don't use more than the 20% of their knowledge.

By this, I mean that all that I have just explained are importance to have a good education. We have to approach it (the education) into the future, be more practical than theoretical; the theory is good for the education background, first of all we start with the theory and

after we start to put it in practice... but now we spent a lot of time in the theory that is less important than the practice. It is obviously that we have to strengthen the practices if we want a better and different education. In the future we be workers but also we will be citizens, our skills have to be developing.

"We understand learning from a social perspective" (Cortruelo J. 2016, page 26)

Learning should be focused in another way. It cannot be that all that we can say about our university title is just a mark, which in some way will be marking our future.

THEY EDUCATE US TO HAVE A TITLE,
NOT TO BE THE BEST WE CAN BE

So then, how can design education be performed, and how is it different from other classes? One example

is Quim Moreno. He treats his students as designers, working with them and giving resources that with time of classes, would allow them to "fill their backpacks". But the personal treatment before and after will be the same. "If we do not treat them as such (designers), at the end of the degree they will not know how to act"

When we finish, the companies want different profiles, depending on the area. But what they find are CVs (Curriculum vitae) where the profiles, in my opinion, are not well defined either captured. Moreover, many times happens that you arrive in a new company/ studio ..., and they give you some tasks but at the same time they say to you how you have to do it. It is here where you do not use the knowledge of the degree for anything or almost nothing. Then I ask myself again, why our teaching and learning tools are the same? If then in the future we will not use it.

2.5 LEARNING TOOLS

What do we learn in class? How we are going to change the world, if we have the same education that we had forty years ago, sitting passively at desks, listening to the teacher, doing exams and some other work. Without really knowing what is waiting for us when we will finish our education, but knowing that nothing that we are studying now will serve us much good in the future when we arrive to the labour market. Where everything is conditioned by the big companies and where the new and brilliant minds with different and innovative ideas are rejected by the majority.

This is my point of view about the evolution of the way of teach that is not changing anything if we compare with other areas like the technology, the relationships, the governments...

To be good... you have to step outside the comfort zone. We have to learn to fail, collapse, strive, be fighting, fall and get up... that's the only way to be prepared for the future. During our life we will have good and bad moments in the professional's aspects, everybody has them.

I mean it is easy to say how we are supposed to act, behave, control situations ... but the difficult thing is when it comes to putting it into practice. We all make mistakes and do bad things, but we should learn from them. This is the main reason to make a research in this field.

2.6 DESIGN PEDAGOGY

In our university and colleges there is a long tradition of teaching design through design practice. For most students their end goal is to achieve a level of capability to function as designers in the professional world. In order to reach these standard, students need to achieve a level of professional 'polish' and presentation to match that of the practising designers.

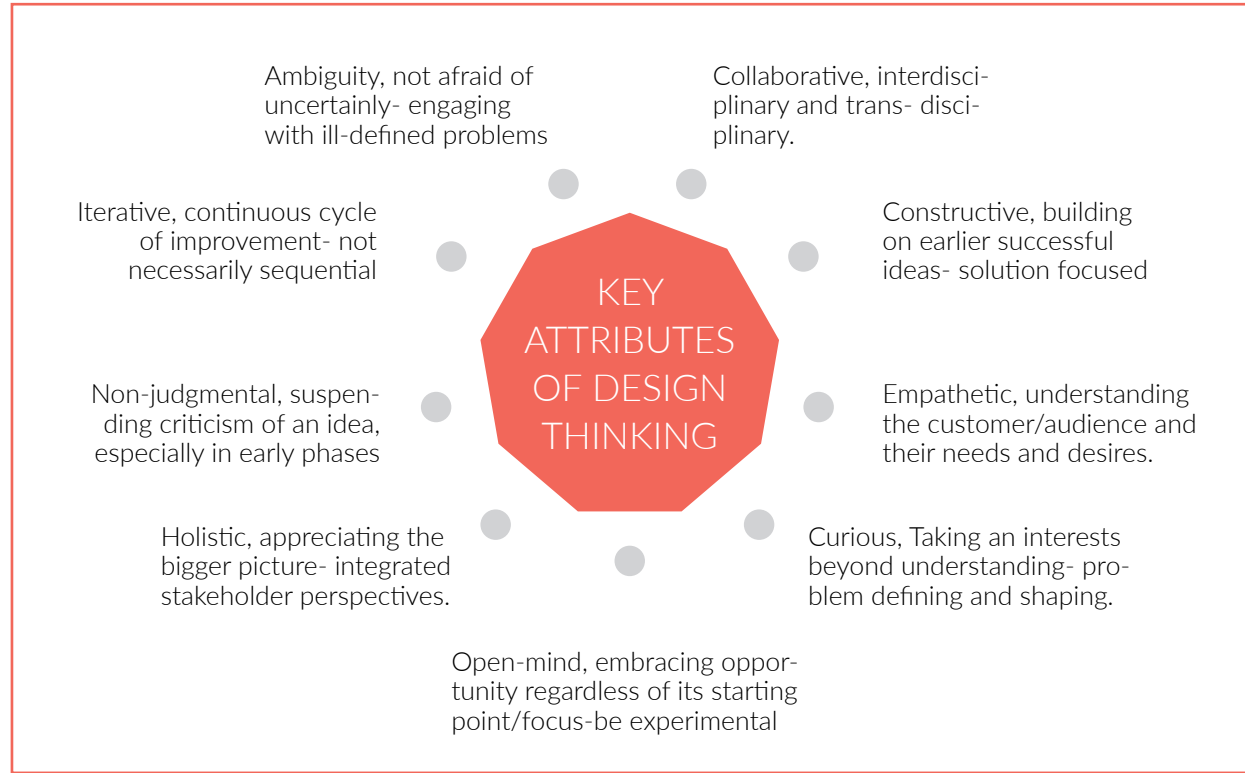
Today it is vital that their education helps them to construct a 'passport' to enter in this professional group. For many design students the physical manifestation of their passport to design practice is their portfolio of design work (Tovey, 2015)

Industrial design teaching and learning is about the transformation of the individual design learner from aspiring designer to being one that is professionally ready. It was an UK (United Kingdom) higher education which started focuses on the efficiency and accountability of a modular teaching, learning and assessment framework. While modularity offers flexibility in some ways, and the self-contained modules are 'administratively neat' in practical and evaluative terms, this is not like design in practice. Design learning is well known for being flexible and centred around developing the individual learner though practice with a strong student-tutor relationship. How such a transformative learning experience can be maintained in contemporary educational settings and this is pertinent to design learning where emphasis needs to

*We lose the love
for learning
and we replace it
with the desire
of passing.*

be on experiential learning and studio practice to help transform design knowledge into practical skill and capability, and it turn produce confident and professionally ready designers.

Fundamentally design teaching needs to provide a platform that can support the teaching of skills and knowledge but also frame the mechanisms for teaching a 'designedly way of thinking'. These are hard element to structure within a constrained modular system that is centred on smaller packets of specialist learning. These different attribute of design thinking are:



2.7 DIGITAL COMMUNICATION

Nowadays the world around us is digital. The most of us use the digital platforms to communicate with others, are write, post and send in a private or public way. The most popular among society are those that are faster, by that I mean that it is not necessary to understand very well how it works, because you do not have to follow many steps to know how to use it. much thanks to all these platforms and apps. Most of the universities have an online platform that they offer to their students to use it.

This service is very common but few students and teachers use it well. Daily use and updates are not usually frequent, that's the problem. Why? Because the most of them are really complicated to use it, the information about the teachers are in the website, the PowerPoints and slide are in the online platform but if you want to put in contact with some teachers you have to use the email...

There are different aspects that I want to talk before pass to the next chapter, Method & Implementation.

2.7.1 Social Media

Social media is the collective of online communications channels dedicated to community-based input, interaction, content-sharing and collaboration. Websites and applications dedicated to forums, micro blogging, social networking, social bookmarking, social curation, and wikis are among the different types of social media. These are some example of social media.

Social media is becoming an integral part of life online as social websites and applications proliferate. Most traditional online media include social components, such as comment fields for users. In business, social media is used to market products, promote brands, connect to current customers and foster new business.



Facebook is a popular free social networking website that allows registered users to create profiles, upload photos and video, send messages and keep in touch with friends, family and colleagues.



Twitter is a free micro blogging service that allows registered members to broadcast short posts called tweets. Twitter members can broadcast tweets and follow other users' tweets by using multiple platforms and devices.



Google's social networking project, designed to replicate the way people interact offline more closely than is the case in other social networking services.



LinkedIn is a social networking site designed specifically for the business community. The goal of the site is to allow registered members to establish and document networks of people they know and trust professionally.

2.8 VISUAL COMMUNICATION

The student app developed in this project needs to contribute to the user's motivation and commitment to learning. After all, what good is a product that is left unused? An important factor in achieving this outcome is to have a design that is attractive to the user, and encourages usage. However, what constitutes a pleasant aesthetic is often considered as subjective, which means that one design can rarely (if ever) satisfy everyone. Nevertheless, there are still a few key points that can help in developing a good design. A good design is not only eye-pleasing but also intuitive, in order to simplify the user experience. This chapter details some of the key points about how to develop and design the final product.

Visual communication design (formerly graphic design) is a creative process that combines the visual arts and technology to communicate ideas. It begins with a message that, in the hands of a talented designer, is transformed into visual communication that transcends mere words and pictures. By controlling color, type, movement, symbols, and images, the visual communication designer creates and manages the production of visuals designed to inform, educate, persuade, and even entertain a specific audience.

2.8.1 Design elements

Design elements are the basic units of a painting, drawing, design or other visual piece and include:

-Point

It is small and round like a dot so it's called 'point. Visual communications (VC's) , or parts of them can be made from point or point can be used to draw attention to certain important areas of a visual communication.

-Line

A line is a continuous dot. The purpose or intent of a visual communication can vary through differences in the width or 'weight' of a line. A fine or light can suggest a specific technical detail or, in the context of an illustration, a sense of lightness or minimalism.

-Shape

A shape is defined as a two or more dimensional area that stands out from the space next to or around it due to a defined or implied boundary, or because of differences of value, color, or texture. All objects are composed of shapes and all other 'Elements of Design' are shapes in some way.

-Tone

Tone is the 'value' of a colour. We speak about tone when we discuss 'light' and 'dark'. Pictures can be made entirely from tone, without colour. This is the nature of a black and white photograph.

Tone can:

- Be used to represent things, objects, people or places in descriptive or symbolic ways
- Communicate emotions, feelings or ideas
- Appeal to our senses
- Be used for practical purposes.

-Texture

Texture is a qualitative experienced sensed through touch . Real textures are those that we can touch and feel.

Texture assists in visually describing the detail of an object, and helps us to understand what an object is made from. It can help us to recognise and understand the features of the environment in which an object exists.

-Form

Form refers to objects that are three dimensional in nature. A form has: height, width and depth. We readily recognise the forms around us – from a pencil to the form of the human body.

Form can be used to define space, create contrast & visually add volume to a composition. Form is depicted visually using other elements such as line, shape & tone. Form can be enhanced using tone, the addition of shadows and highlights can help us to 'read' the true form of an object. Forms can vary from geometric &constructed to the organic forms of the nature world. Form can be communicated via a 3D Isometric Drawing of a loose & flowing charcoal life drawing.

-Colour

Colors play a large role in the elements of design with the color wheel being used as a tool, and color theory providing a body of practical guidance to color mixing and the visual impacts of specific color.

Colour can be used to create:

- Contrast
- Hierarchy
- Mood
- Convey Emotions
- Define Space

-Type

Type is the physical representation of the words we speak and is used to put these words down on paper. Type is available in many families of font styles and is a way to communicate our thoughts and ideas. Type can be part of a logo (logotype) or combined with other elements to create a decorative image to emphasise a purpose.

2.9 DESIGN PRINCIPLES

The Principles are concepts used to organize or arrange the structural elements of design. Again, the way in which these principles are applied affects the expressive content, or the message of the work.

2.9.1 Principle of repetition & pattern
The principle of repetition simply means the reusing of the same or similar elements throughout your design. Repetition of certain design elements in a design will bring a clear sense of unity, consistency, and cohesiveness.

Repetition works with pattern to make the artwork seem active. The repetition of elements of design creates unity within the artwork.

Patterns often occur in nature, and artists use similar repeated motifs to create pattern in their work. Pattern increases visual excitement by enriching surface interest.

2.9.2 Principle of proportion



Proportion is the relationship of two or more elements in a design and how they compare with one another. Proportion is said to be harmonious when a correct relationship exists between the elements with respect to size or quantity.

Good proportion adds harmony, symmetry, or balance among the parts of a design. The effective use of proportion in design is often referred to as harmony, a relationship in which the various elements of the composition appear as if they belong together in size and distribution.

For example, if one figure is made to look larger compared to other figures in a composi-

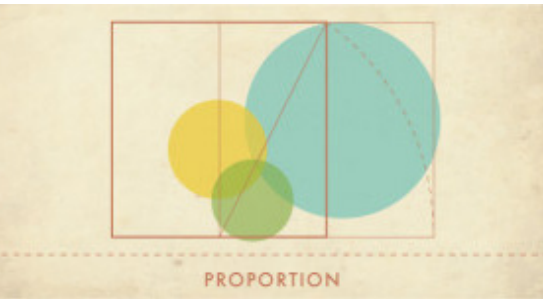


Figure 4/5/6/7 - Examples of design pedagogy

tion, it is said to be out of proportion and is given greater importance.

2.9.3 Principle of hierarchy
The order in which the elements within a composition are viewed by the eye. We can call it the order of importance.

- Where does the eye look at First
- Where does the eye look at Second
- Where does the eye look at Third

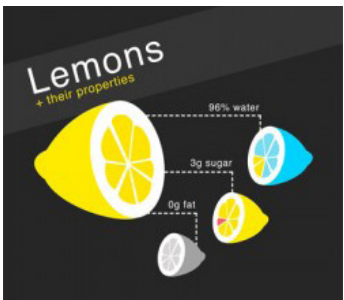
How is visual hierarchy evident?
What elements & principles are creating the visual hierarchy? is it:
· Contrast
· Scale
· Proportion
· Textures
...



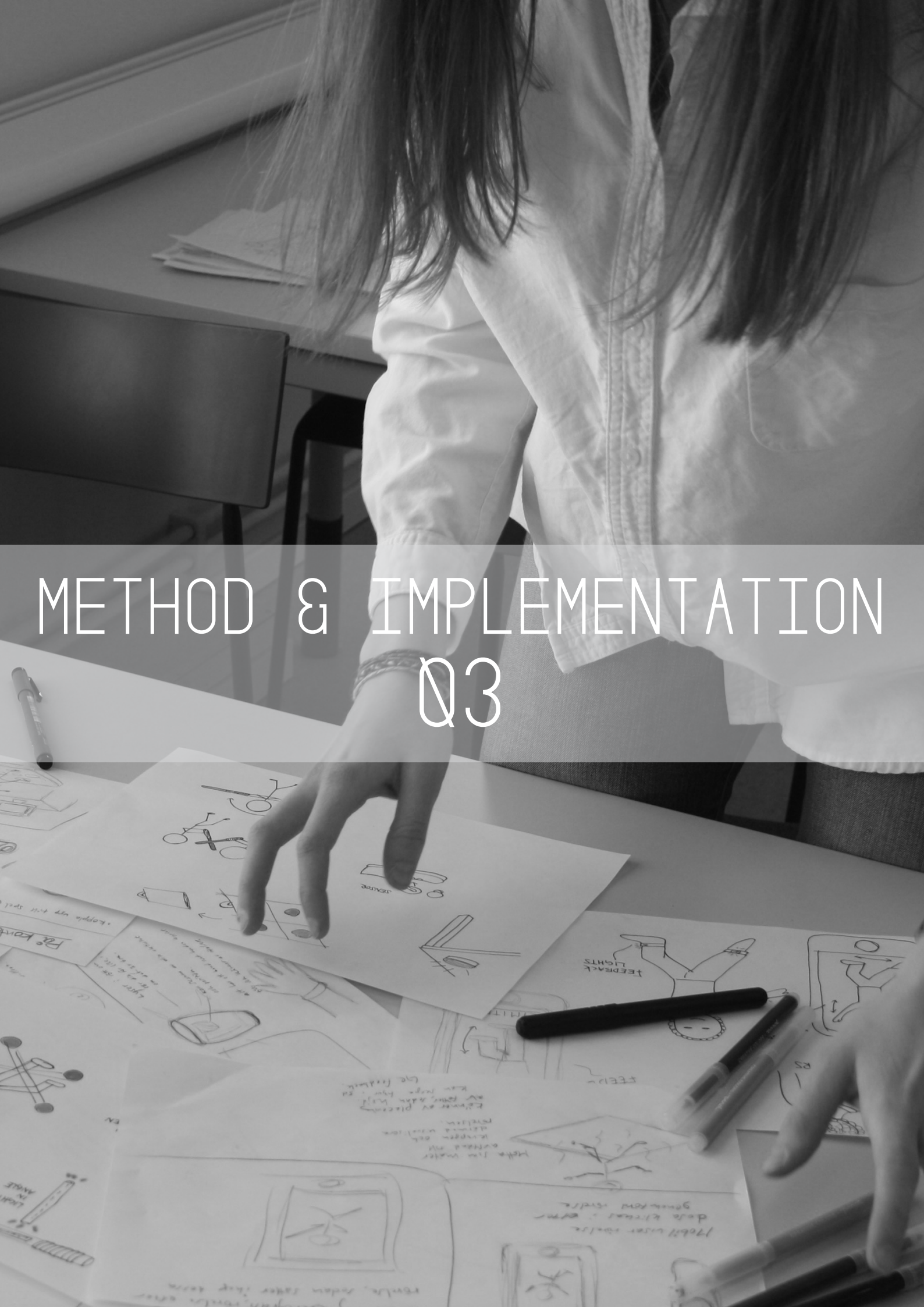
2.9.4 Principle of scale
Scale is the size you may choose to draw or place an object in relation to the ground it is placed upon. The ground can be a business card, flyer, poster, website, fashion dress or building.

Scale is used to assist in drawing large objects such as houses and furniture and is used to describe the dimensions of these drawn objects.

Scale can be used to create visual impact by creating a sense of depth and the feeling of tension.



There are five more principles, the information about them are in the appendix. The are:
· Figure - ground
· Balance
· Cropping
· Contrast
· Scale



METHOD & IMPLEMENTATION03

This chapter describes the process and methodology used in this project. The process used in this project consists of 6 stages, a combination of Design thinking methodology. The methods used throughout the project are described below.

3.1 PROCESS

A structured process is desirable in order to keep the project development generative, iterative and sharp (IDEO, 2016). The process used in the master thesis project is a methodology of design thinking. The project has six different phases: **Empathize**, learn about the audience for whom you are designing, by observation and interview. Who is my user? What matters to tis person? **Define**, create a point of view that is based on user needs and insights. What are their needs? **Ideate** brainstorming and come up with as many creati-ve solutions as possible. Wild ideas encouraged! **Prototype**, build a representation of one or more of my ideas to show to others. How can I show my idea? **Test**, share your prototyped idea with your original user for feedback. What worked? What didn't? **Implement**, Put the vision into effect. Ensure that your solution is materialized and touches the lives of your end users. This is the most important part of design thinking, but it is the one most often forgotten. As Don Norman preaches, "we need more design doing."

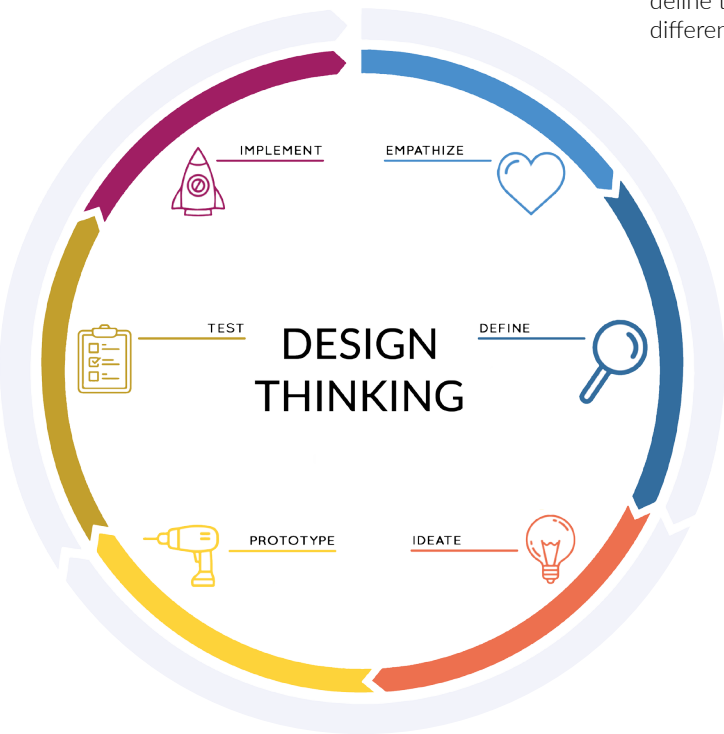


Figure 8 - Process infographic

In Design thinking, observation takes centre stage. Observation can differentiate what people really do as opposed to what you are told that they do. Getting out of the box (or pre-set environment) and involving oneself in the process, product, or experience is fundamental.

3.2 PLANNING

The first task that needed to be addressed when the current project was initiated was to prepare a proper schedule. As the scope for the development was quite extensive - spanning 20 weeks - a properly defined plan would be beneficial in making sure that the right amount of work was performed at each stage.

A Gantt chart was created to get visual overview of deliveries and the different phases. A Gantt chart is a tool for visualizing the planned time disposal. It is used to map activities and time against each other in order to describe the project timeline. The duration of different activities is visualized as horizontal lines that correspond to the timeline. (Johannesson, Persson and Pettersson, 2004) The chart provided structure and acted as a guideline throughout the project. The chart also visualized different phases in the project.

PLANNING

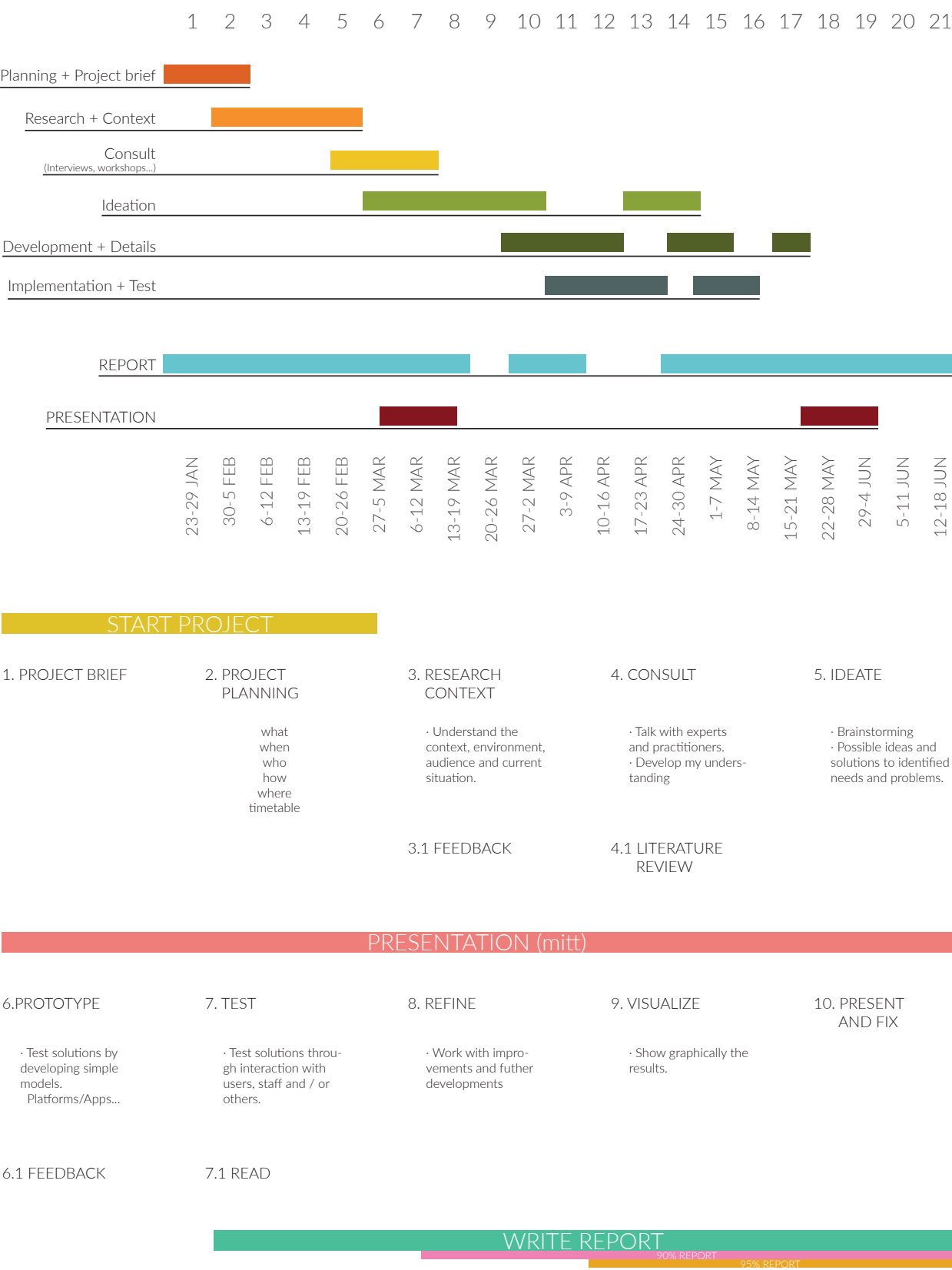


Figure 9 - Gantt chart & Planning

3.3 INSPIRATION

This stage consists of the data, needs and problems collection through literature reviews, analysing the existing product, interviews and questionnaires done in Sweden as well as in Spain.

3.3.1 Literature Review

The project started with a literature review, to get the needed knowledge of the subject, to base the work upon. Also, to get a deeper understanding about the project's process. Even though the literature review belonged to the first phase in the project, it somewhat continued when needed, during the other phases of the project.

A literature review is a good technique for identifying what it is known and unknown in the area of interest. With this information, formulate research questions and what subject areas to further investigate. It can also make you discover new necessary areas to do research on. The quality of the literature review is based on the author's efforts to search for relevant information, how thoroughly it is evaluated and how critically it's analysed (Bolderston 2008).

The review conducted in this study covered relevant research fields such as service design, learning tools, design pedagogy, design education... These areas were initially researched on a broad perspective but deepened as the project developed and the need for additional information was discovered.

3.3.2 Workshop

A workshop with students at the university was held to get input from people with little or no insight in the project. This opens for ideas that are not limited by the restrictions of the situation for the design. Such problems and needs were analysing in the meeting to get more information and such ideas can inspire and trigger solutions that would not be thought of by the design team. It was a different way to get more information about the university 'needs, which areas are the best and which one are the worst, besides thinking of which improvements will be interesting.

The workshop was held at the university in the oval office, an office which is situated in the design department, it has one big round table and chairs, other table higher and the walls are whiteboards, this is a good way to draw and make diagrams, you have all the space you need and there are no limitations to your creation and imagination.

During the workshops we did two different methods. The first one was a customer journey map, first of all was defined one person with the method "personas" we described Allan. He was a boy with some experience, end and life goals. We described to his interests and after we started with his experience in one course. The second part of the method was describing the different part of the course, the beginning, first's assignments, how many theoretical classes it had had, the presentations, feedback lessons (it is a great experience that students qualify like very interesting for their projects). The last step of the customer map was analyse the

individual's actions, feelings, perceptions and frame of mind-including the positive, negative and neutral moments- as he interacts with the service over a period of time, which was a course during one semester.

The second activity was to describe the best and the worst at the university and the different improvement that we can develop in a close and distant future. The students had a very good participation; we obtained interesting problems and improvements that it was perfect to keep on with my project.

3.3.3 Interview

In order to get an insight of other people's feeling, attitudes, ambitions and values, interviews are effective. Interview is a good method to use in the beginning of a project to get an understanding of the stakeholders and how they relate to or use the product (Wikberg-Nilsson, et al. 2015). Unstructured interviews are often based on topics rather than specific questions, where the answer can be widely explained. By an unstructured form, the interviewer can build a relation throughout the interview and get qualitative results, (Cicourel, 1964). These are key points, not writing during interviews, just recording them and not asking questions, if we talk to the interviewer is more personal and we will probably get a more interesting answer because they forget that they are in an interview and give their real opinion and explain better the experience. I have written about the student point of view, their needs, problems... but It obviously that the teachers have others needs and problems. If we want to change and

improve the education, relationship and the communication we will have to improve for both, teachers and students.

To start knowing more about teachers and their opinions I was doing some interviews. I spoke around 45 minutes about different topics, what kind of tools they are usually use in their classes, if they would like to make some changes in their way of teaching or if they had done someone. Which improvements had they done during their period being teachers? If they thought that we can change or improve the student experience in the university...

Different points of view, different opinions, they have more experience and they have had different students, so their opinions are very useful.

The resultsof these interviews are in the forth chapter, Results.

3.3.4Anecdotes

Every day in the universities around the world there are a lot of different anecdotes and histories that happens to the student and teachers, some of them are good and funny, however we can learn about those are not good.

In this project I thought that it was going to be interesting if can touch "real" problems and have personal interviews with some people related with the university to find the main problems and needs, that is why i decided to talk with different people working in the LTU.

I have been talking with some students here in LTU about anecdotes that had happened to them the last years and it was very interesting because I could find some problems in the day by day that I had not taken into account.

3.3.5 Benchmarking

Benchmarking is used to get comprehensive knowledge of possibilities and what solutions others are using. Stephen A.W Drew (1997) writes "Benchmarking is applicable in multiple fields and the goal is to concentrate the attention towards the most interesting and notable solutions for the specific task. J. Main (1992, p. 104) defines the method with the following sentence: "The art of finding out, in a perfectly legal and above-board way, how others do something better than you do, so you can imitate-and perhaps improve upon their techniques".

The area that I am researching is very big and it has different approaches so I had to analyse different aspects, I have done a research of the different platforms which students are used to use. How often they look and update it, if they usually use the platforms to communicate



Figure 10 - Workshop group

To design different, think different. To design different, think different. To design different, think different. To design different, think different.

with their teachers or if they use others ways by email, in the office, classes...

In upcoming sections is a poster which is like a summary about the different opinions of students around the world.

Moreover I thought that this was not enough, so I decided to do other benchmarking focus on the learning, teaching tools and apps.

During the literature review I read one article about the Student Competence Profiles that Åsa Wikberg-Nilsson and Peter Törlind had done few years ago. I found this article because during one of my meetings with my supervisor, we were talking about the future, how our CV will do it and after that we focus on the ways that the teachers had to graduate the students.

She gave me one article, "STUDENT COMPETENCE PROFILES". I have read a lot and done many researches

about the same field, but with this article was different because I have had similar conclusion as them. That was very positive for me, I mean I had similar ideas, so I just had to follow the path and think ... think different if you want to design different.

The article was about the different ways that we have or we should have to qualify a student. Exits more skills and knowledge than the ability to solve a mathematic problem, memorised five history chapters or know how many countries are in the world. Firstly I would like to say that these topics are basic, it is mandatory to pass them before finishing high school, education is a law that all the inhabitants have and that is why if we have the opportunity to study culture, history, mathematics ... we have to benefit. But learning the way to develop skills, develop skills all together, learn of others, have the capacity to reflex and correct ourselves... these are things as well important than the other knowledge.

So ... Why not mix the two parts of teaching?

The theoretical part
+
the development of skills

3.3.5 Needs and Problems Analysis

A needs analysis was used a tool to summarize the findings from the users (interviews and observation) and translate finding into needs and requirements for the product. A need analysis is suggested to be one of the early stages is a human-centered-design process to confirm that the design team understand needs from different stakeholders and considerer there in the process (Smith, 2011). The purpose of the needs analysis was to clarify the needs expressed by different stakeholders so that the final result could strive to satisfy those needs as far as possible.

A problem analysis was defriended as a complement to the needs analysis. The problem analysis highlights problems that were identified in the existing service, users experience and learning tools. The problems that I identified were both detected through comments in the interviews and observations, but also details that I observer while teachers and students were in a class or in their office.

One method I used was the stakeholder profile. I made a template and gave it to different profiles, students of engineering, economics, nursing ... from Sweden and Spain, also teachers of different grades and from different countries. This was an interesting tool to get problems and needs from different points of view. What are the real needs and problems that we have?

Most of them are not easy to find, real problems are very difficult to see at first. Sometimes it happens that we are not aware of the problems since we see them as if they are facts that cannot be changed and we must live with them, however great inventions and discoveries were thanks to people who thought differently without really knowing what they were going to find. But that's really the best way to find different solutions, thinking differently.

Thanks to this method I could find real problems to start the phase of ideation, in the next chapter, Results where you will find a better explanation about the conclusions of this method.

3.3.6 Inspiration posters

To start with the prototype, first I take the most popular apps and try to find what the common characteristics are. Which colours (each colour mean something), layouts, structure, icons... are using for some specific functions and start the final design.

The posters are showed in the next chapter, there are different kinds depends the area/ fields researched.

3.3.7 Survey

The area / field of the online platforms web in the universities was more profitable if I asked students about it than if I get start a research. So I did a Google Survey and I send it by email to students around the world, the majority were in Spain but I have other countries like USA, Netherlands... I need this survey because this area is so interesting for my project, there is a part that focuses on the relation among student and teachers when they are not together (home, library, working in groups ...) and first of all I need to find the problems and needs and then try to solve it. The result of this survey is an info-graphic I have done and I have explained in the next chapter

SURVEY QUESTIONS

- 1-In what country do you study at the moment? City?
- 2-Does the university provide students and teachers with an online platform like Moodle, Canvas...?
- 3-Which?
- 4-Do your teachers use it?
- 5-How often do they update it?
- 6-How many times a week do you visit the virtual platform?
- 7-Do you communicate by email with your teachers?
- 8-Could you say that they are quick to answer? How many hours / days do they normally take?
- 9-When you have to solve doubts, do you prefer to solve them in class, go to the office or by e-mail?

3.4 IDEATION

This was a creative idea generating phase where several creative methods were performed. These methods were selected in accordance to the project's aims and goals. The goal for this phase was to generate a lot of ideas and then converge them into three concepts for the next phase

3.4.1 Mind Map

In this phase I have used the mind map to organize my ideas; I have obtained a lot of different problems, needs, ideas which probably will become good ones...

Mind mapping is a simple technique for drawing information in diagrams, instead of writing it in sentences. The diagrams always take the same basic format of a tree, with a single starting point in the middle that branches out, and divides again and again. The tree is made up of words or short sentences connected by lines. The lines that connect the words are part of the meaning. A mind map can be described as "a visual representation of areas, subjects, ideas and aspects that concerns a certain theme and that shows how different factors connects" - Wikberg-Nilsson et.al. (2015) p.45.

The mind map was visualized with connecting bubbles, where each bubble represents a project-relevant subject, to make the structure intuitive. Some affected areas were decided to be included in the project's limitations, and therefore their bubbles have a lowered opacity. The mind map was divided into three main areas, the most important for the project: Learn, teach and people. It is totally related with the title of my project, from the key points I began to order the different ideas that had relation with each one of them.

3.4.2 Problem list

Before starting this method I was thinking about how we should pose the solutions, but it is better to start creating and giving solutions without thinking about how we can implement them, that is something for the following phases. Thanks to the problems and need analysis I could take the list of the main problems

Thanks to the analysis of problems and needs, I was able to write the list of the main problems. In the next chapter there is a graphic explaining the relation between the problems and their solutions. In this subchapter I will explain the ideas / concepts selected, a brief explanation, what is the main idea and the problems that solve each one of them.



In this graphic I wanted to reflect the connection among people teachers and their students but at the same time the importance which is learning and teaching. The ways to learn and teach are infinities and there are so many possibilities so Why we have to settle this education? We can do amazing things; all together we will be able to go further. It represent the connection between these fields, and the different circles around them are more areas interesting in this project that there are explained later.

Figure 11 - Mind map, connecting people



Figure 12 - Brainstorming in Pamplona



Figure 13 - Working in a LTU room



Figure 14 - Brainstorming in oval room

3.4.3 Brainstorming

Brainstorming can be an effective, creative and quantitative method for producing ideas if performed right. One of the most important pillars of brainstorming is to create the right environment with distinct rules according to Osborn (1976). He continues with stating that the right environment is a setting where the aim is quantity, encouragement of wild ideas and absolutely no criticism.

To start brainstorming as I was the one who was going to do it, I thought about it in a different way. I divided the method in different parts and different days. It is obviously that when you are alone your creativity and imagination are smaller and less crazy than when you are with a work-group. That's was the main reason that I divided the sessions in different days. The first day I was thinking about what we need, what are the real problems that we have to try solve? Then the following days I tried to find solutions that I would like to be real, write and draw to explain how we can develop the new concepts. After the brainstorming, when I had the relations, concepts, ideas... I started another method more creativity it was the "six thinking hats".

3.4.4 Concepts Development

In this subchapter I will explain the firsts ideas and how I came up with them.

I have tried different creative technics like: The checklist, six thinking hats, lateral thinking, change perspective... and the more effective was *Six thinking hats*.

3.4.4.1 Six thinking hats

Developed by Edward de Bono in the early 80s, this popular technique is now used by businesses all over the world. They involve putting on a selection of metaphorical hats when it comes to making a decision. Each hat represents a different direction of thinking.

You and your team members can learn how to separate thinking into six clear functions and roles. Each thinking role is identified with a colored symbolic "thinking hat." By mentally wearing and switching "hats," you can easily focus or redirect thoughts, the conversation, or the meeting.

This method can be used in a group or on your own, and you may find yourself 'wearing' more than one hat at once. They let you think and decide on topics in a rational yet creative style.

- The White Hat calls for information known or needed. "The facts, just the facts."
- The Red Hat signifies feelings, hunches and intuition.

When using this hat you can express emotions and feelings and share fears, likes, dislikes, loves, and hates.

- The Blue Hat is used to manage the thinking process. It's the control mechanism that ensures the Six Thinking
- The Green Hat focuses on creativity; the possibilities, alternatives, and new ideas. It's an opportunity to express new concepts and new perceptions.

- The Yellow Hat symbolizes brightness and optimism. Under this hat you explore the positives and probe for value and benefit.

- The Black Hat is judgment - the devil's advocate or why something may not work. Spot the difficulties and dangers; where things might go wrong. Probably the most powerful and useful of the Hats but a problem if overused.

3.4.4.2 Concept 1

The first idea was create an application that its approach will be the personal notification in the academic fiel.

3.4.4.3 Concept 2

The second idea started with the concept of re-design the way of teach.

3.4.4.4 Concept 3

The third idea was to focus on the way to qualify the students and to growth and to develop personal skills.

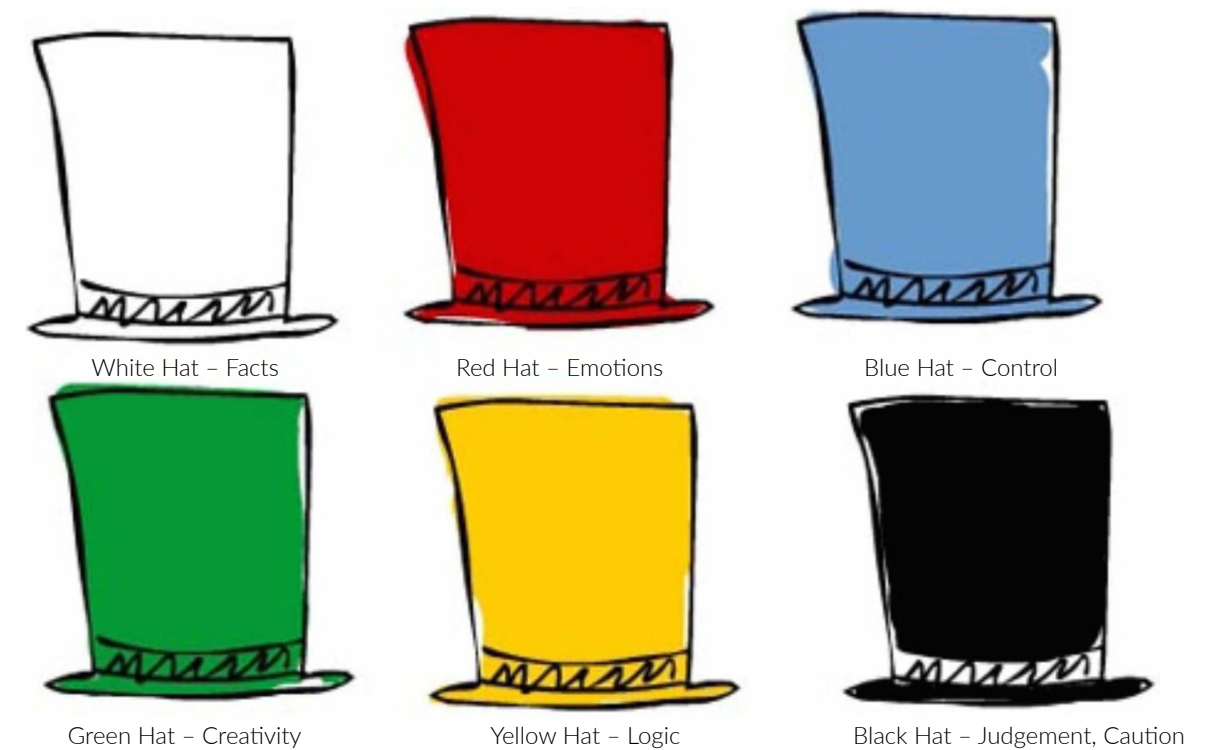


Figure 15 - Six thinking hats

3.5 DEVELOPMENT

After the development of the three different concepts I had to start with the development of the final concept. For this I start a new method that focus in the interaction design and service design.

3.5.1 Development concepts

After the technique “six hats” I had three different concepts, good ideas to solve the main problems but just ideas, now is time to develop them. I kept on reading more about methods but the best was to stop the development and start to organize my ideas. I had different concepts that solved the problems, but just ideas. I started to think, how I wish it was that solution, why I would like this. I did not stop at this point, I was continuous thinking in the same questions but taking different roles.

I was thinking like a passionate student about his/her degree, passive teacher. As a teacher who engages in teaching 100%, neutral students (they like the university but they do not spent so much time)... different roles I thought that we can find in a university class.

In my opinion this method is so interesting; nowadays there are different users, so many different profiles. We cannot organize people like: Students, teachers... The per-

sonality has an important role and that is why to develop the best concept we will need very different perspective to answer the questions. I want to have as many users as it will possible.

The results of this method are the concepts, a deep explanation of each one are in the next chapter, Results.

3.5.2 Design an app & service method

When I started the final product development phase the first idea started being the idea of an app. I am going to explain the different steps that I was following because this idea is not my final concept but in my opinion is very important for my project this part so I have explain step by step the evolution.

I had read different articles about how I should develop an app, how I should start the process... and I chose one which explains the process that I should lead over the app development.

The author is Michael Flarup 2015 and he says in his article that: I've been designing apps for nine years now! So much has changed since the early days and, it feels like developers and designers have been through a rollercoaster of evolutions and trends. However, while the actual look and functionality of our apps have changed, along with the tools we use to make them, there are some



Figure 16 - Development process

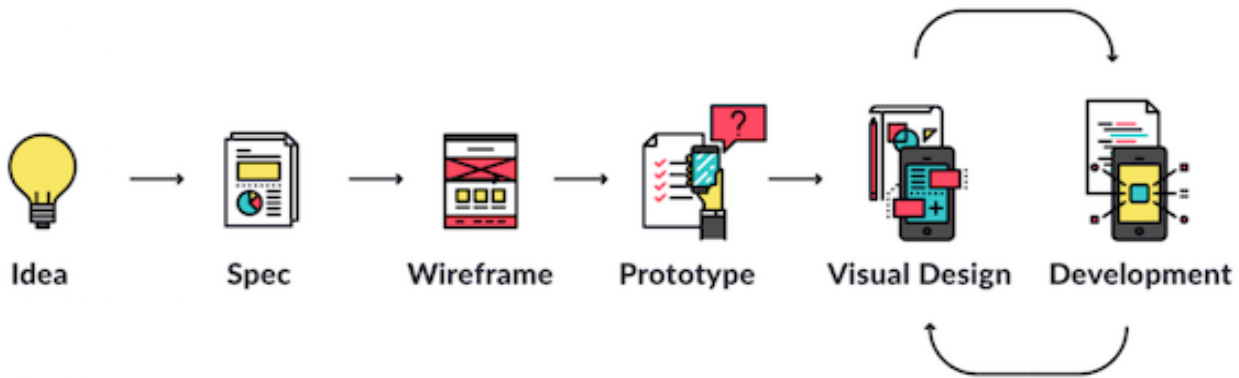


Figure 17 - Design process of an application

things that have very much stayed the same, such as the process of designing an app and how we go through the many phases that constitute the creation of an app.

IDEA

Everything starts with an idea. This might be your idea or an idea that a client has approached you with. Ideas are great, but they're also a dime a dozen. The sooner you realize that ideas are nothing but passing phantoms of something that might one day turn into a product, the better you'll be able to handle this phase. We tend to put way too much stock in ideas, as getting the idea 'right' is far less important than people think. Ideas are sealed up and protected by NDA's, paraded around in pitch decks, and tend to take on a very defined state much too early.

Depending on the type of idea, there are different questions to ask.

- Is this idea financially viable?
- Is this idea technically feasible?
- Is someone else already doing this?
- Could this be made simpler/differently?

SPEC

A 'Specification' or a 'Spec' is the piece of paper(s) that declares what your app does and how it is accomplished. It's the blueprint if you will. There are quite a few ways to do a spec, ranging from the lighter (also sometimes called a 'brief') to the enveloping complete enveloping breakdown. No matter which way you choose to go about it, always do a spec.

The real trick is deciding what to include and what to leave out of a spec. It is best to keep things short and concise under the assumption that the more you write, the more can be misinterpreted. List both functional and non-functional requirements. Explain what your app is, and not how it needs to be done. Use plain language. In the end, the best spec is the one that is agreed upon by all parties.

WIREFRAME

A wireframe, also known as a page schematic or screen blueprint, is a visual guide that represents the skeletal framework of a website. Wireframes are created for the purpose of arranging elements to best accomplish a particular purpose. The purpose is usually being informed by a business objective and a creative idea. The wireframe depicts the page layout or arrangement of the website's content, including interface elements and navigational systems, and how they work together.

The wireframe usually lacks typographic style, colour, or graphics, since the main focus lies in functionality, behaviour, and priority of content. In other words, it focuses on what a screen does, not what it looks like. Wireframes can be pencil drawings or sketches on a whiteboard, or they can be produced by means of a broad array of free or commercial software applications. Wireframes are generally created by business analysts, user experience designers, developers, visual designers, and by those with expertise in interaction design, information architecture and user research.

The next step varies greatly. In fact, the next three steps are all entwined and often run alongside each other.

PROTOTYPE

With the spec and the wireframe in hand, we are now ready to attempt a prototype. The word prototype in this context covers many different things, but ultimately it's about creating a bare-bones version of the app with the goal of testing your hypotheses and get early feedback.

How you choose to prototype depends on many different factors. The most important thing in this step when deciding is getting early validation of your idea. A bad experience with a prototype might cause you to uncover issues with your wireframes, your spec, or even the very core of your idea. You can then, before you've invested time in the next two phases, make changes or abandon it entirely.

VISUAL DESIGN

You get to what is more traditionally consider 'design'. Visual design deals with the appearance of the app. It is not just making things look nice, but also making sure that there's a consistent and identifiable visual language throughout. Here design helps, not only to tell a story and communicate your brand, to guide users through challenging parts of the app, but also to make particular aspects of the experience more enjoyable.

Proper visual design should build on top of all of the experiences you've made in the previous stages. It should support the overall ethos of the idea, the goals defined in the specs, the flows laid out in the wireframes, and the lessons learned from the prototype. Visual design is not just a 'skin'. It's not a coat of paint applied to make things look pretty. It is the visual framework you use to create a coherent and consistent experience, tell an engaging story, and differentiate your product from others'. Great visual design elevates the mundane, clarifies the unclear and leaves a lasting impression with the user.

DEVELOPMENT

Next up, or as is sometimes the case, alongside, is the development of the app.

ITERATE

The real truth that seems to catch many people off guard is that you're never actually done designing. In most good projects, designers have product ownership from spec to ship. You don't want design becoming a relay race where you hand off something to another department or group of people where you don't have a say. Even just listing the individual steps like I've done, I run the risk of misleading you, as it can very easily be understood as a progression that runs from A to B. Designing apps, or anything for that matter, is rarely a straight line or a clear succession of stages.

The underlying process of making apps remains largely the same.

- 1.Get an idea
- 2.Write it down
- 3.Build a prototype
- 4.Enter into the dance between design and development until something comes out of it

This part was one of my development steps, where I have thought in different solutions of the problems and needs.

3.6 SELECTION OF IDEAS

After the development of the three different concepts I had to start with the development of the final concept to solve the main problems. For this I did a selection and evaluation of the ideas. I was analysing the different concepts, What were the problems their solve? Then I had to choose one and start the last step, the final result.

To choose one concept I used the method, map it. This method is about a technic of creativity to evaluate ideas; we only need a pen and a sheet.

It starts describing 8 different questions; you will have to answer with each concept. Draw a big circle in a sheet, one each concept and dived the circle into sections (8). Now you have to answer the questions from the point of view of each of the ideas.

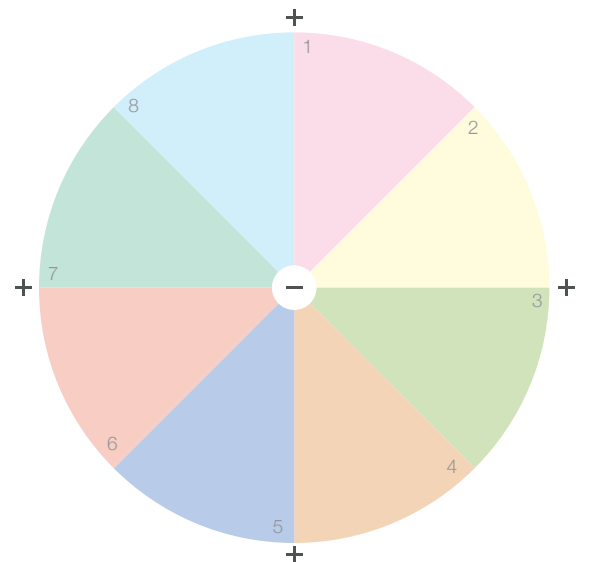


Figure 18 - Selection method circle

- The questions I have used were:
- 1-Can I communicate the idea completely and clearly?
 - 2-How much interest do I have in this idea?
 - 3-Do I have enough time to develop it?
 - 4-How good is my opportunity to do it?
 - 5-Do I have the skills to realize the idea?
 - 6-Could you apply my strengths in realizing the idea?
 - 7-Does this idea have good competitive advantages?
 - 8-How different or unique is this idea?

I had to answer the questions honestly and depending on the score I considered giving each one, I had to draw a black dot in the part of the circle that corresponded with the question. The closer the black dot to the centre, the fewer score the concept has on the question and the more away is, the score is higher.

This is the circle used to select the concept. It is easy to understand. The pink correspond to the first questions, the yellow the second, green the third... The results of the method are in the next chapter.

3.7 IMPLEMENTATION

In the last stage the three ideas that were chosen in the ideation stage were developed and evaluated into three concepts. The implementation phase focused on improving the final concept and tests it. Develop different prototypes, and combine the tests with the develop stage. Like an iterative process to get the best solution.

3.7.1 Prototype

During the last month I toggled between sitting at the computer writing the report and doing user testes with different prototypes. The phase prototyping get around 3-4 weeks, I did different types of prototypes. I have started with paper prototypes; these are easy and quick and at the same that I was developing them I could did changes. Then I followed with simple screens just the structure and some icons and simple layouts. The final prototype was developed in Adobe Illustrator and I used two programs to make the prototype more real, "Axure and Justinmind" are the name from the programs.

3.7.2 User test

There were different testes; I had different prototypes so I was testing different users with them and during the sessions I was accumulating the feedbacks, answers, doubts... It was the best way to understand and discover what it was wrong in the app and what icons were the best to understand the functions.

I tested students and teachers during one month, they behave in an open way so there were easy to understand them and thanks for that the results were really good.



Figure 19 - Design process



RESULTS Q4

RESULTS04

This chapter presents the result of different stages in the project. The results are presented under each process stage; inspiration, ideation and implementation.

4.1 INSPIRATION

This section presents the results from the inspiration stage. The result includes descriptions of all the identified stakeholders and analyses of how their thoughts and opinions affect the project. Results from the interviews and observations are summarized in 'stakeholder profiles'. The stakeholder profiles are the most central end result of the ideation stage and they have been used throughout the two coming stages of the project.

In Design thinking, observation takes centre stage. Observation can differentiate what people really do as opposed to what you are told that they do. Getting out of the box (or pre-set environment) and involving oneself in the process, product, or experience is fundamental.

4.1.1 Stakeholders

At the beginning of this project, such as unique stakeholder were the students but as the project was developed, I have started thinking about new and real stakeholders. The students of course but the teachers, the universities and the companies too are stakeholders, because the experience that one student has is related directly with

their teachers and with the university. Besides one day in the future, the companies will want our knowledge for their products and ideas.

STUDENTS, The students pay different amount of money for their education. They spend a lot of hours per day doing different test, project, exams, studying... We could say that the most of our time during our "young life" waste in something related with our studies.

TEACHERS, they have studied around 5 years in the university to become teachers and I know that the most of them love their job but the energy that they had during their first years is not equal than now...

UNIVERSITY, Public and private university have thousands of students and the university is a service that we have in the countries but depends the country you have some service or facilities. The university is like a business because the new and brilliant brains are in the university so if you have the best you will be the best.

COMPANIES, Finally the companies have different interests, I mean not all the companies want the same and need the same but all of them need workers. Nowadays there are problems among the students and the compa-

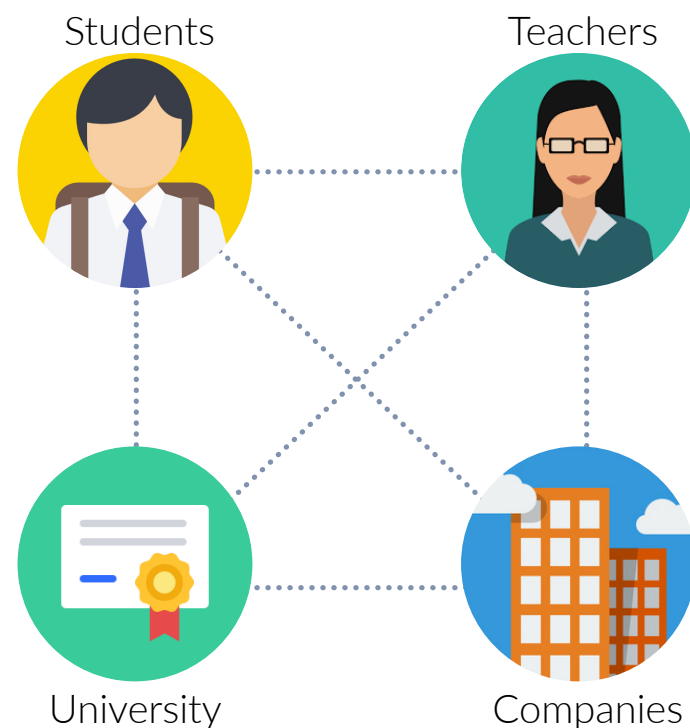


Figure 20 - Stakeholders infographic



Figure 21 - Inspiration phase

nies because we do not feel like we are prepared for the future.

During all the time I have been working on my project, I have not left reading and writing about topics related with it. I have read magazines, articles, books, website, researches... in both Spanish and English. That is why I have now a big knowledge about the fields I have been touching.

In all the different information sources there were a part of benchmarking, I mean, the articles I have read had some products or services that I could use to inspired myself to the develop of my project, different ideas to inspired or to delete them.

The benchmarking carried out has been complex. The area and field that I have been covering is so abstract, services are intangible products and there are many different kinds of them so find the good ones were very difficult. After the benchmarking about the: online platforms, services, apps, website... I have taken some key points.

One of the best articles I have read and taken inspiration was about one research that Peter and Asa had done. Other inspiration sources was the own feel I have been during my degree in Spain and Sweden. How I would like to feel and how I have felt during the last years. Examples and real experiences are always the best option and the best inspiration.

4.1.3 Workshop

As I have explained I did a workshop with some students here in the university, the results I took were several. I will explain below this paragraph and the structure of the results will be the same order as the activities carried out in the workshop.

The first activity was: Create a profile and take his role. We had to imagine what he would think if he will be there with us. We describe a new member, Allan. Allan was a 23 man, he was from Linköping, Sweden and he has interests about: Technology, Video games, Socializing, outdoor activities and cooking, he has been studying Industrial design Engineering. As well he was different goals, experience, life and end goals.

After describe the new "classmate" we started describing a course that they had had the last semester. We were analysing, discussing, criticizing... all of this feedbacks were drawing in two big sheets, you can see below. The first one summarize the activities they did during the quarter and the second is the feelings they had during the activities and lessons of the course (the draw is a timeline).

The second activity was individual. "Think in your idyllic university and compare with this one" What is the best? What is the worst? What kind of improvements would you like to have?... They wrote the ideas in the post-it and pasted them (the post-it) in the wall. The results were interesting, more than I thought. I have collected in three different boxes depends the answer.

WORKSHOP'S RESULTS

- Ask teachers and get information
- Teachers are available; go talk to them in the office.
- Supervisor or another teacher in the field, they can guide and often give books to borrow or say what articles to read.
- Easy to speak to teachers
- Easy to find teachers by searching on LTU website.
- When they reply fast.
- Studenttorget, guide you in the right area or specific person.

The worst

- If the teachers are not in their office... you need to wait or email, that can take a lot of time
- You did not get information about how it (canvas) works.
- Most of classes the maps on canvas are unorganized.
- The mobile application for LTU and canvas has not been working very well.
- The canvas app can only show a limited amount of information
- Really hard to get contact and email for weeks without reply.
- Sometimes assignments have changed in the middle of a course
- If you have a question it can be hard to talk to the teacher.
- You get info about a course task from classmates, not from the teachers.
- The info teachers give on canvas is not the same as they give you in class.
- Notifications through mail is NOT a good solution

Improvements

- FIELD VISIT!
- Connected to the program.
- Introduce practical work experience.
- More guest lectures from companies/ other universities etc.
- More project-team for thesis student
- More in contact with the teachers to ask or just talk.
- More opportunities to work with students from different years/degrees
- More courses should span an entire semester specially design-courses where you need time to create and incubate ideas.
- More access to meet teacher in person.
- Better contact with the industry.
- A normal student spends a couple of hours a week just finding somewhere to sit.
- Few news in the group technics design industrial engineering on Facebook.
- There is many lectures or event that happen that can be hard to find.
- No students write in that group either.
- Would be nice with a more open communicate for example if you sell a book from other course or need help from other students.

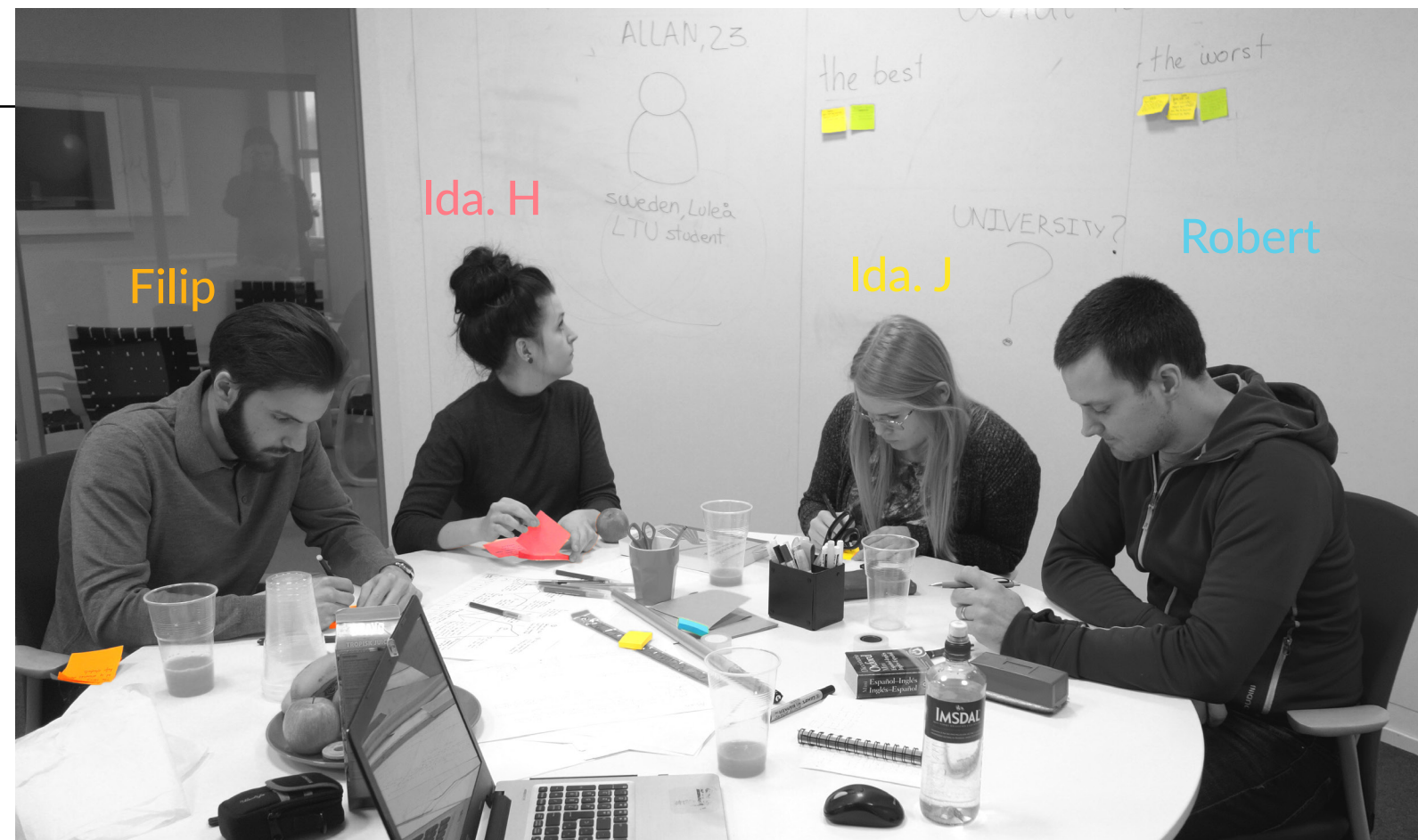


Figure 22 - Students working in groups

WORKSHOP GROUP

4.1.4 Problems

The main problems that were identify during the inter-views and workshop are summarize in one poster after this paragraph. There are a lot of problems, some more important than others. It is impossible to solve all so I have chosen the most important and essential to create a good product.

But now I am going to explain one problem that is the most important nowadays for everyone. FEEDBACK, we do, we write, we speak... always to express our feelings, emotions... and get a feedback. This feedback can be an answer, an act, a like, a comment...



Figure 23 - Speaking with Ida about her experience.

4.1.5 Needs

On the basis of the important about the feedbacks, I take that need and start the development of services to solve it. Apps like Instagram, twitter, whatsapp, facebook... being popular because these give to the users a quick answer, the use is so simple and this two things are the main reason about their success.

During the free time not only the young people spend a lot of hours looking the screen of their mobile phones, adults do the same and use the same apps. We move for the answers we receive from around us, family, friends, other people, nature, university, work... And the students

are exactly the same behaviour. We need feedbacks about our projects, if we are studying well or not, advices...

After more than three years in the university I realize that if the relationship with my teachers and the feedbacks that I have received during my bachelor were different and better probably I would have learn more and different, I mean, my knowledge it would be the same but the way to learn it wouldn't be the same. We need more interaction among people and quick information and messages.

One real need and we do not want to think that is real is the necessity to have feedbacks and to be "popular" and like others.

The service it has to be something quick, simple and it has to combine with a new method of teaches and learn-ns. Connect students, teachers, university and companies with a new service it would be the best way to solve the problems.

4.1.6 Anecdotes and interviews

In the second chapter, Theoretical framework I mentioned the anecdotes part and in the third, Method and implementation, I explained the different interviews I had done. Now in this chapter I will explain the results of both. It starts with the anecdotes and after is explained the interviews.

The first one was with one girl that she told me: "I always try to find the information in Canvas but the way that the teachers have to put the information in the platform is different with each other, it is very difficult for us to find the information in little time ..." So for example if the platform has a template to follow and teachers put the information in the right section, (theory, practice, problems, assignments...) Nobody will has more problems to find it.

Another group of friends told me that the last semester they were in a course that the information in class, CANVAS and the one the teacher gave in his office was different; this is something that is a chaos for the students because... what is the correct information? To solve this kind of problems, that they are very common, the teachers have the responsibility to update the information every day, and if the information is wrong they will have to accept all the different projects that the student have done...

One boy told me that the last Christmas he have done his final project from one course and then when he arrived to the university after the holidays he compare his project with his friend's project and he saw that the structure of project was totally different, he had read the wrong information... so he had to correct it in only two days... Why did not he do right the project? Due to the information of the project was in two different sections. There was a section with information but at the end of the document there was a link to connect to a website which described the correct template. This is a clear example of what ha-

PROBLEMS		SOLUTIONS
We haven't learnt anything, classes are very theoretical.	————○	More practical,less theory during the classes, to be efficient
We cannot apply knowledge	————○	Internship,work with real companies during the degree
Memorize instead of learn for the exams and one week later forget everything	————○	Change the methodologies
Few responsibility in the degree, after, excessive responsibility during you start a work (decompensation)	————○	Work on projects, real companies, public competition, with real rules, but in the project that you would like to work
Companies want people/student with experience, but... Do they give the opportunity to have experience?	————○	Internship every year during your university period, it is so important. Increasing gradually the periods of practice depend on the students' capabilities
Lack of critical and self-critical	————○	To be realistic, to show the projects, would increase the motivation, because when we have to share our own work we always try harder
Self-overcoming' spirit	————○	Give the best of yourself, something that motivates students enough to make it better and better
Are teachers enough motivated?	————○	If they see their students getting good results and doing their projects well, they will be happy and proud, so that motivates them to continue developing new methods, creating new learning tools and proposing different activities.
Student'evaluation , only a mark?	————○	If we change or we add different sections or ways to graduate the students, they probably will have more argues to show their skills and capabilities
The relationship between teachers and students is too big, the problem is that both teachers and students feel that teachers are at a higher level than students	————○	We all educate, learn, teach ... that's why we should all be willing to give and receive, and the best way is to work at the same level, without a feeling of superiority, because no one is better than anyone else.

MOTIVATE BOTH, STUDENTS AND TEACHERS, THIS IS THE MOST IMPORTANT.

Figure 24 - Main problems & solutions

pends when the information is in two different areas, and there are no notes to let you know it.

Now is the interviews time.

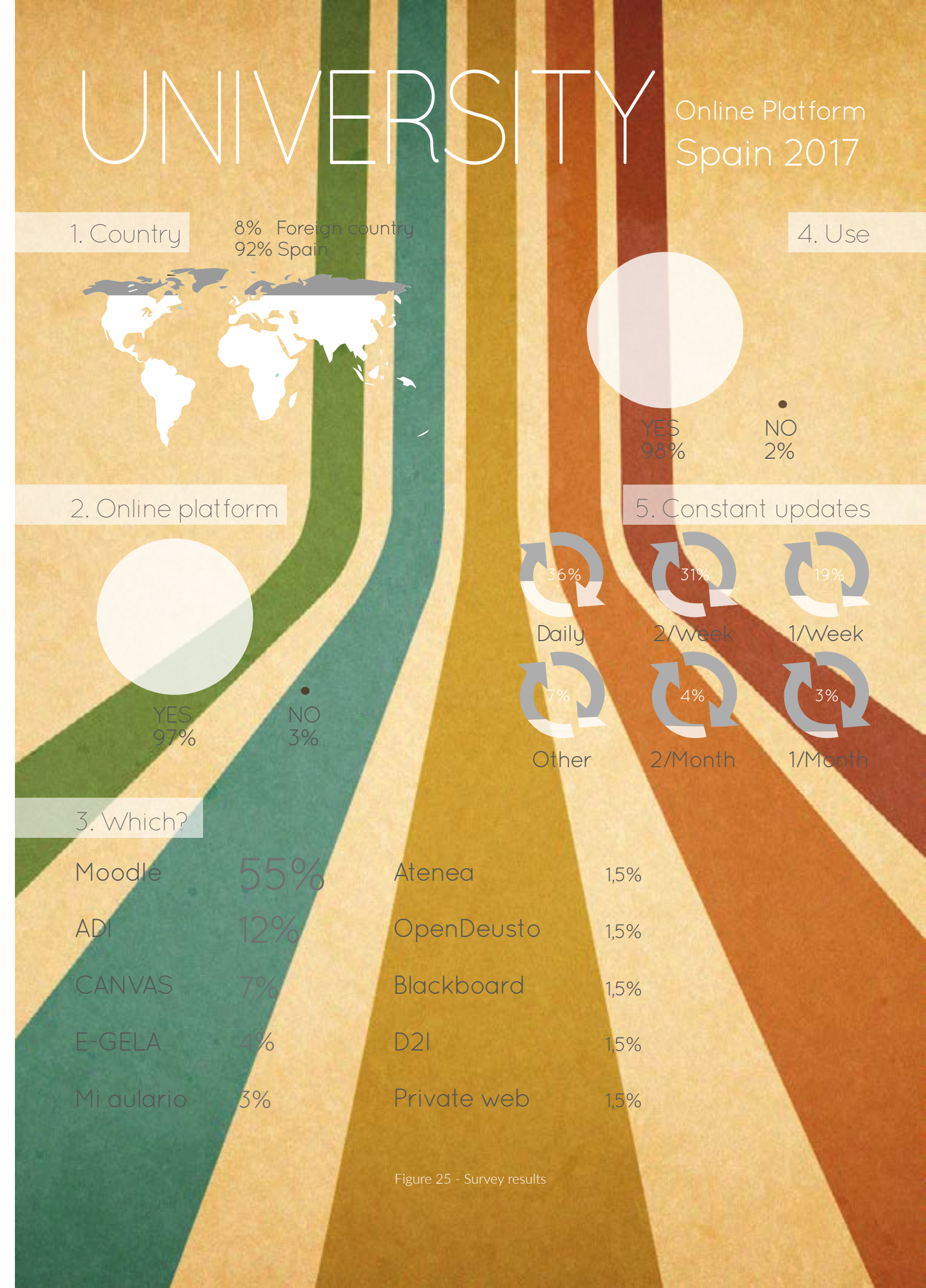
One teacher said that is so important to have discusses during the classes; explain the most important parts of the theory and to work with the students. He had been changing his methods of two of his courses to try other kind of teaching, he uploads videos in CANVAS and YouTube, students have to watch it and write doubts, what they want to have more and better explanations... after that they have classes to solve the problems and to work all together about the topic.

That is an interesting way to work because they can watch the videos when they want, they don't have to move to the university and they can organize their lives however they want and after they meet in the university or in other spaces and discuss about the course. I am a student and as a student I know that whoever is studying wants to know so that they will use everything they are teaching in the future, I mean everything theoretical is good and we will understand it if it is accompanied by examples, practices, and exercises that put in Practice everything we learn so that we can remember it more easily.

The last minutes of the interview we were talking about other way to graduate the students. Is it possible to get more information about one student than his marks of the exams? Some articles I have read in magazines about the creativity, learning tools, and the way to teach design... explain that when we leave the university we do not know very well what to do, and when we go to a company we only have a university title. Where are our skills, abilities...? We have been developing them during years, the knowledge is important but our skills too and these are the real difference between one student and other. He was agree with me that it is an important issue and it would be interesting research more about it but he told me as well that is complicate to qualify each student about their skills, first of all because they do not know how to do it and besides because they will spend a lot of time doing it.

4.1.7 Survey

The info-graphic of the next page represent the result of the survey I have done. Thanks to the results I can find more problems, for example there is a big problem with the updates in the platforms and the uses are not to correctly because the student just use them to check some information and the information usually is wrong... The % of the success is very low...



4.2 IDEATION

4.2.1 Brainstorming

The results were not successful. I thought that the method is was going to work because I have had any problems with it but do it alone was not the same than do it in group. So that is the reason I decided to start another method. With the result of this method and the next one I developed three concepts missing the ideas, problems and needs finally I got good results.



Figure 26 & 27 - Ideation in a room, developing the final concepts.

4.2.2 Concept 1

The first idea is create an application that its approach will be the personal notification in the academic field. Every student has an user in our respective online platforms that the university give to us. But the uses of these are very limited, we prefer to talk through faster applications like Facebook messenger, Snap chat, Whatsapp... They are simpler and faster. The success of these applications is due to these characteristics just mentioned. Then, at this point I wonder, why do not we make the communication from the university also fast and simple?

EFFECTIVE!

The idea consist in develop an app to cover these needs and problems, in a simple way provide users quick messages, will connect teachers-students, different chats private and public ones, and current information, personal information about the courses, where he/she should be in that moment...

Problems that it solves:

- Lack of information.
- More personal information.
- Quick when looking for information.

- Quick at the time of informing or be inform.
- Personal timetable and help you to be organize.

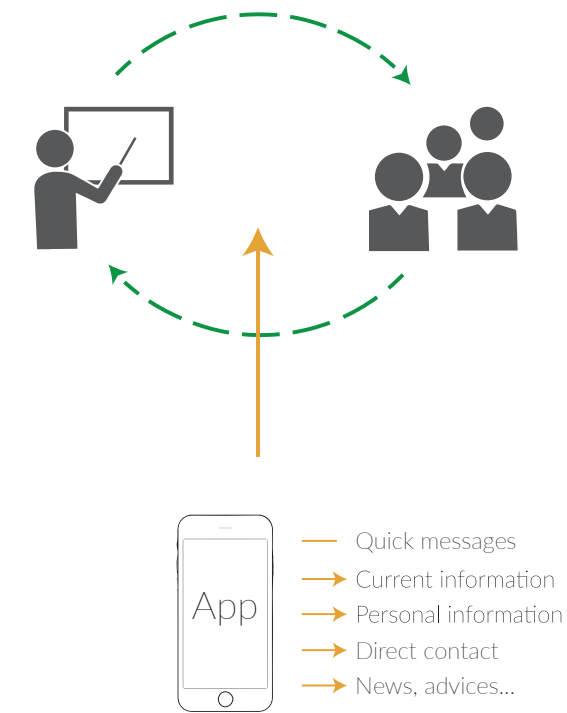


Figure 28 - Concept 1

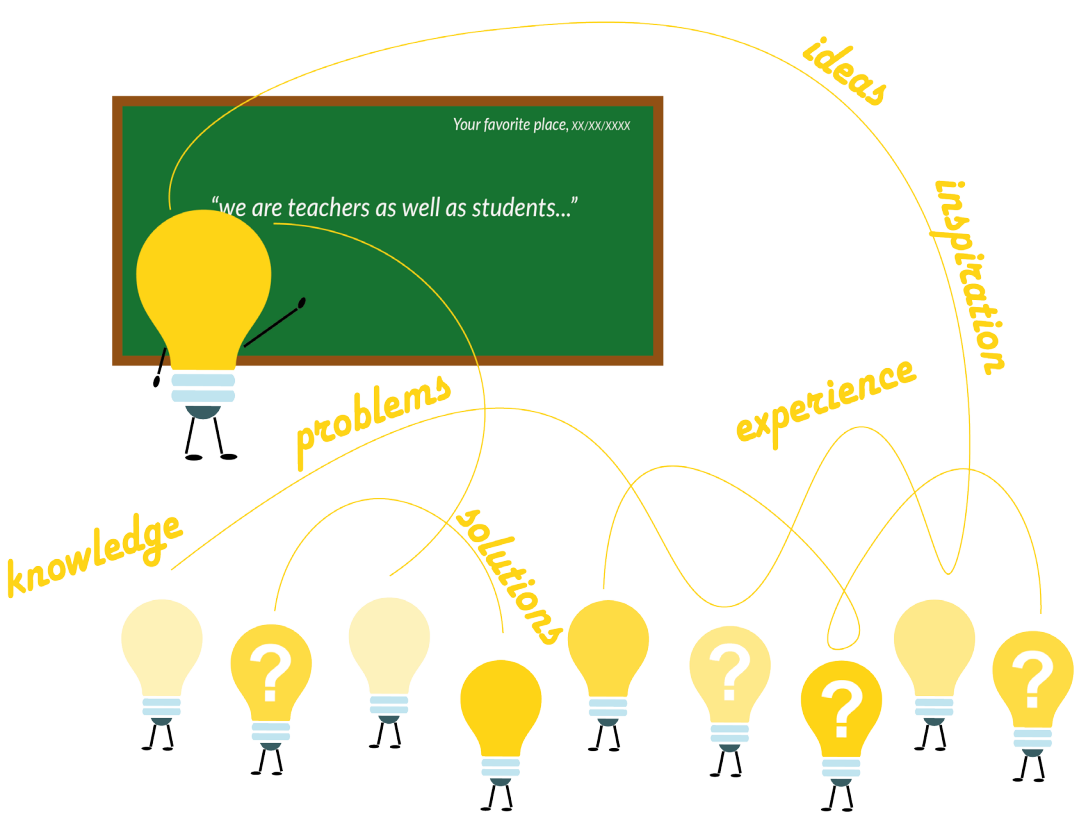


Figure 29 - Flow information teacher & students

I would like to explain graphically the idea that I have had throughout the project on the relation between teaching and learning.

We have a wrong idea about the teaching, the concept that has been generated in society about education and teaching is that teachers teach and students learn. It is obvious that teachers only for the knowledge acquired throughout their academic career and for the experience they have in comparison with their students. They know

more but this is not just what we learn. That is why I want to focus on the importance of mutual learning.

The knowledge, experiences, anecdotes, great ideas, creativity, imagination... of both, teachers and students are important. We are at the same level; we have to learn from each other, is like a flow of information.

4.2.3 Concept 2

Here in this concept the idea is to re-design the way of teach. New tools, new times (Duration of a class), new and different work environment... You have to open up to the world and creativity, if we do not do it from young people we can hardly get it. This idea is more abstract because is a service, there is nothing that can represent it, then I will explain how it would work and what it would be based on.

Consist in change the education way, to start instead of having two hours a day for 4 or 5 days a week, we could concentrate everything in one or two days a week and create longer sessions. These sessions will have different breaks to relax and eat, drink something... but lectures where the learning is on-going. In a same day we could keep information, understand it, assimilate it and work on it. This is how you really learn, working hard on something. At the same time of this kind of sessions during the semester, it will be other kind of lectures, where students will present their projects, ask doubts, give and receive feedback ...

Feedback is a term that we are not aware of the importance it has. Everything that surrounds us, social networks, university, society... Everything of these are different feedbacks that they give us for how we are, how we behave, what we create, we generate... We all like to be recognized for the effort we make, and for that, we must reward the continuous work, this is where the idea of feedback starts.

If as the course progresses and with it our projects, we have different classes / informal presentations in which we can give and receive advice on our ideas by both teachers and students, it is clear that the result will be better. All the opinions add up and this is why it is better to give them as we advanced and developed the ideas, that at the end of the course when it is too late to make changes or improvements.

For this is the new approach I have explained previously. The new way to grade students and develop projects.

-Feedback classes, these do not have to be on-site, not even formal presentations. We could bring ideas, draws, graphics, only explanations... all that we want.

-To foster the pupils' participation in class and at the same time dialogue between pupils and teacher.

-But at the same time, there will be breaks, everyone needs moments of leisure to relax and have fun, meet new people, listening each other, not always we are going to work with the people that we would like to, so we have to used to different opinions and stances...

Problems that it solves:

- Memorize even understand.
- No real feedbacks.
- We make mistakes, it is not bad but we need enough time to correct them.

- We finish ill prepared.

4.2.4 Concept 3

In the develop part of the third idea I will focus on the way to qualify the students and to growth and to develop personal skills. As I have already explained in the Theoretical Framework chapter we have to change the idea about the teachers. In this new concept what I propose is change the role of teacher by one “Coach”, the name change but is not the name what is important, the new role that he/she takes is the most important. The new coach must motivate, support his/her pupils, he does not have to be an obstacle but a motor for them. Between all we have to get the best part of each one.

In the universities we learn various disciplines/ courses and with these, and with this they assume that we know the rest, in what and how we should work and for what will be useful in the future.

It is important to have knowledge about different fields depending on the careers, but it is also important to develop other skills to become a good professional. For example: have the ability to speak well in public, write very good reports/ articles, know how to be in every situation, create an event and organize it, leader a workshop, give a lecture as well as know how to understand and assimilate the knowledge.

These kinds of things that have never explained and they assume that we know how to do them and also well. But NO, it is not like that. Most likely, our teachers have learned from experience and over time, that this is good we know but if they teach us how to do it well we could get better results and we will become better professionals, workers, inhabitants...

The idea now is to change the teachers but at the same time to add more parts to the courses, the idea is to keep on with the projects, exams, works... but at the same time during the semester do different activities to develop these skills that I have just said. Like meetings, talks, workshop, travel with the uni...

There are million ways to learn so Why just focus on learning math, chemistry, history, literature ...?

Problems that it solves:

- We will be more prepare to the labour market
- Student´ evaluation are only a mark?
- Self-overcoming´ spirit
- Learn more than common courses.
- We finish ill prepared.

4.2.4 Select ideas

After the development phase was the selection of the concept to develop the final design. I put in practice the method I had explained in the last chapter, Method & implementation.

The main point is answering the questions honestly and at the same time depending the answer draw a back dot in the circle. The result after the method was, the first concept.

Why we know, who was the winner?

Because after drawing the eight black dots and join them, it creates a figure and is in this moment when you have to calculate the area (m^2) compare the three and the one that has highest mark is the winner.

This concept is about the development of an app, that help the students and teacher has a better university life but I thought that this was not enough and I could develop another product more interesting and useful if I combined this app with the second concept.

So finally the concept that I have selected, was the first but with some influence of the second. The idea of an app and the feedbacks was the two first concepts, in the next subchapter I will explain the process that I followed during the final development.

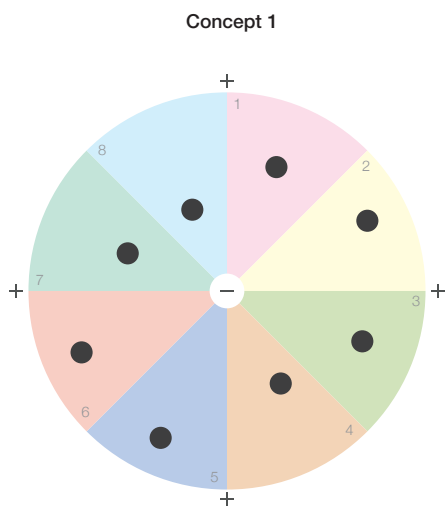


Figure 31. This circle shows the results of the winner concept



Figure 30 - Developing second concept

4.3 DEVELOPMENT

4.3.1 The process followed

The process I have been following was iterative, first I focus on an app, just an app to solve the relation among teachers and students and as well with the university area. But... I did not want that because is similar to what we have now, this in this sub- chapter I explain the process iterative and how I put in practice... Go back and correct mistakes is not a way to waste time, is a way to be closer to success.

4.3.2 First idea

The idea consist in develop an app to cover these needs and problems, in a simple way provide users quick messages, will connect teachers-students, different chats private and public ones, and current information, personal information about the courses, where he/she should be in that moment...

Just an app can help you to have an easier day in the university, what do you have to do the next hour? Where is your next class? Is your teacher in his office? Do you like to know more about the events in the university? ... These questions could be easy to answer for some students but for others will not have any ideas to answer....



Figure 32 - Developing final product

Go back and correct mistakes is not a way to waste time, is a way to be closer to success.

The concept developed in the ideation phase was similar and I did not think much more to get with the development of the app, I deviated from the design and started with the structure. What are the problems that will solve? Which are the main functions? What would be the most innovative service?

During the design I was trying to answer these questions in a graphic idea and functionality, I mean when the shape is defining the function. If you take one product that have never seen it before and know how you can use it, we can say that this product has a correct relation between shape and function and the design in this case is very good. This case is for a tangible product but knowing that the concept is an app and service, how can we use it?

For the app, it will represent it in the pictures, icons, layout... The more intuitive the product are, the more possibility of understanding and success.

4.3.3 Need changes

But after this phase I decided to change my concept again, to make a re-design about the idea because in my opinion it was like an ordinary app, I want to do something different, that it will be useful for the students, teachers, university... so an app was not going to be very different like another university app, there are in play store probably more than one hundred similar apps. This was the main reason to change it.

The development of this idea took me about 3 weeks, I developed it almost in its entirety. The following sketches show development during the first and last day. I used them to do a user test. They are explained later, in the implementation section. All of these sketches represent the first develop of the idea, before the design of the final design.

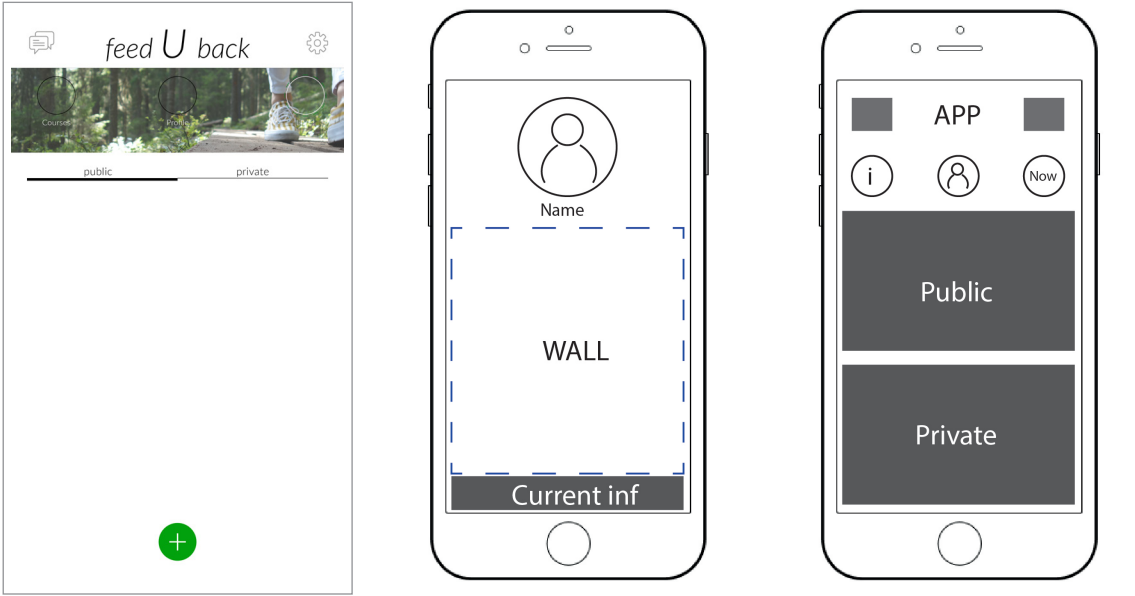
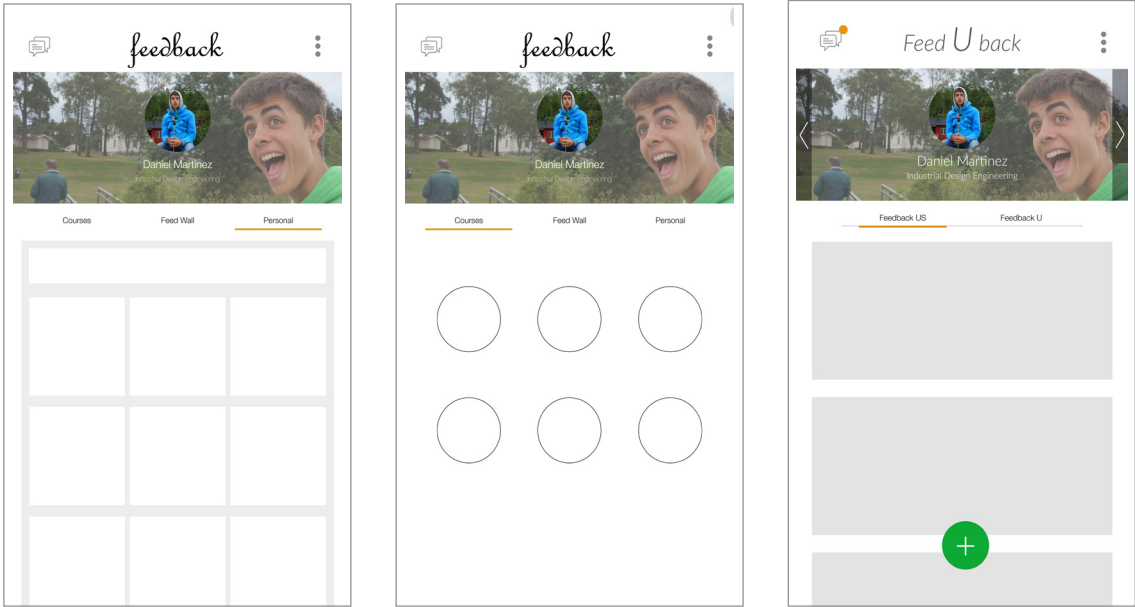
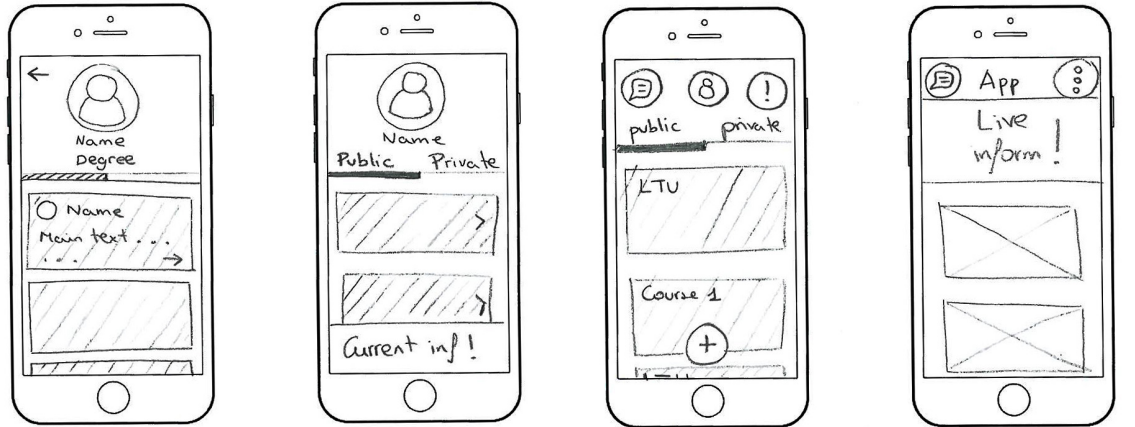


Figure 33 - App sketches

4.3.4 New methodology

As I just explained I decided to change my concept. I liked some ideas of my last concept so I took them and then I started again, I did not start from the beginning as in the ideation phase. I had to do just some changes and following the development.

My changes started with the idea to combine the app with a service. Why? Because the future in this world is going to be the service, the service is different between take a product or other, decided the university to study, the car for your family... Nowadays the services that we have in society have evolved and are becoming better, but we must continue to improve and offer what customers want. You have to indulge your needs.

So if I can develop the correct changes in the service that the university gives us, probably I will achieve to have a great service that proportion the best experience in the university for everyone, students and teachers.

I am going to explain the idea and the justifications about the decisions.

We have to anticipate user needs.

MAIN FUNCTIONS

The main function of this new service is to change the way of educating and teaching students. I mean classes are not as effective or productive as they should be, a new way of teaching with different kinds of lessons, new activities, new approaches ... It will be the best for everyone. Teachers will have to be motivated, they will have to think more about their classes, how they would like to receive their classes in the past when they were in college and apply it in the present. They have to update their knowledge and teach with passion.

There will be 3 or 4 kinds of lessons, where the purpose will be different. One will be to develop skills, help students to develop abilities, how can they do develop and improve? Sometimes our teachers think that we know how to present a project in a correct way or how to make public speeches, how to organize a work group... there are several skills that we have to develop it during

our bachelor and master for the future. Because when we will finish do you think that you will be prepare to the real world? In my opinion is very important the knowledge but to be a person with interesting skills and abilities is very important too. During our learning time we must learn how to develop them, then we can be perfect future professionals. We have to work hard to get them, but if you never try, you'll never get it.

Other classes will be like total classes or workshops ... I will explain it in the next chapter.

PROBLEMS & NEEDS

The problems and needs resolved are several, they are explained below.

Lack of help in personal and career development.

Continuous development and feedback in the projects, lack of dynamism.

Lack of a faster and more informal means of communication, comparing with mail

Lack of help in personal and career development.

As I just write in the last sub-chapter, the lack of lessons or talks about the explanation and activities and acts that we can do to develop different skills, in the near future we need external help or we will not be able to complete a task. With this I do not want to say that receiving or asking for help is something negative but it is better if you develop yourself as much as you can.

The reason for this kind of classes is because everybody has different strengths and weaknesses, and we cannot be perfect but we can work to be better, so if you work on the skills or weaknesses that you are not good at the same time you strengthen the ones that are better you will probably get the best part of yourself and there will be nothing to stop you.

Continuous development and feedback in the projects, lack of dynamism.

Another problem is that we work in different project at the same time, for different courses and with different groups... and sometimes this is a chaos. Organize all is not very easy... Other problem or example is that we have to do a project, after six weeks we have to send it but after the teachers 'correction what happens? We can see our mistakes, what was the best idea, and the worst but we cannot do any correction. It is necessary a feedback about our project obviously but only the final one?

If we have during the process more classes and opportunities to explain and show teachers and classmates our project progress, we will get a better result and we could do the necessities changes.

Lack of a faster and more informal means of communication, comparing with mail.

The last problem is that there are some messages that are important but they do not need a formal mail to send the information. Other kind of information like reminder, advice, new notification... that are like Facebook messenger or Whatsapp, quick messages to send information in a simple way. Easy for everyone.

4.3.4.3 How it works

The idea is create a new service/ methodology that help each student to learn knowledge at the same time that they develop their skills. Combine different lessons during two or four months.

To obtain the expected results in the students, they will have to implement the methodology during the course time, and probably we will obtain the hoped results. The idea is help students to develop their skills at the same time that studying the courses, so if we leave enough time to assimilate and time to practice it, we will get the final result that we wanted to have.



Figure 34 - Desining the final journey map

We need time, energy to make all the different classes, enthusiasm to learn and to become better.

And now... an app, for what?

I have been thinking in the part of the quick information, quick messages, feedbacks... How we are improve the relation, the day a day in the university, the projects, works, results of our assignments...

The methodology is probably the best option to help in the development, solve the problems and cover the needs, but if that methodology combine with another service that solves the other needs like the communication, replies, news... it will be the perfect service that universities will be able to offer to their future students. The app is explained in the next sub-chapter, the different parts of the structure and the use of them.

4.3.5 Characteristics app

1. Personal Profile

Here the user will be able to see his/her profile. The information that the app has and gives is: name, perso-

nal photo, the courses has taken, the information about them: classes, teacher, room, next assignment, teachers mail... and he/she will be able to make the changes in any of these sections.

2. Messages/ mails

This section is intended for private messages, when some teacher or student wants to connect with someone privately or create a chat group to talk about projects, workshops... They will be able to use this way of communicating, faster and more effective than the mails. It is totally private so any other user cannot see the information and messages of the student or teacher; it is the same privacy idea as an online platform (canvas, Moodle ...).

3. Live information

The live information gives the user the current information, what he/she is supposed to be doing, if he has class or presentation and where. Example: Presentation in English, A – 3001 (10:15-11:45), it will give the information for the student in a simple way. If you have classes today the application will tell you, but if you have nothing to do today, this section will tell you what to do next, the presentation tomorrow, or the workshop in two days... The main function is to facilitate the day to day student.



Figure 35 - Graphic design, Illustrator & Photoshop



WALL MESSAGES

The wall is going to take the 2/3 of the home screen, is one of the most important functions of the app. It is going to give the users the most important information for them. In a way the information given is personal, all users have three types of information, the general information about the events and news of your faculty and the university in general. Quick messages where the teachers of their courses publish important information to notify students, and finally feedback messages where students can express an idea, ask questions about their projects to their classmates and teachers, is an open wall For all that student of the university.

Each student has the responsibility of their comments, questions, answer... so they have to think what they are going to write and publish.

4. Quick Messages

This is one kind of messages that gives the user information about their courses, important information for the next classes or week, notify a meeting, changes in one class...

Information that is relevant and the teachers have to notify and update this information. It is an easy way to give the information more than the mails and online platform.

5. Events/ news

This is another kind of messages, here the user will received information about events, news, advices of the department that he/she is studding (example : if you are studying physiotherapy you will received information interesting for you about the health and caring science department or if you are studying design engineering you will have the information of the department of engineering...) and besides in this wall we have to add the global information for all the student of this university Example: If it is going to be close the university the following days, timetable of the coffee shops, next films...

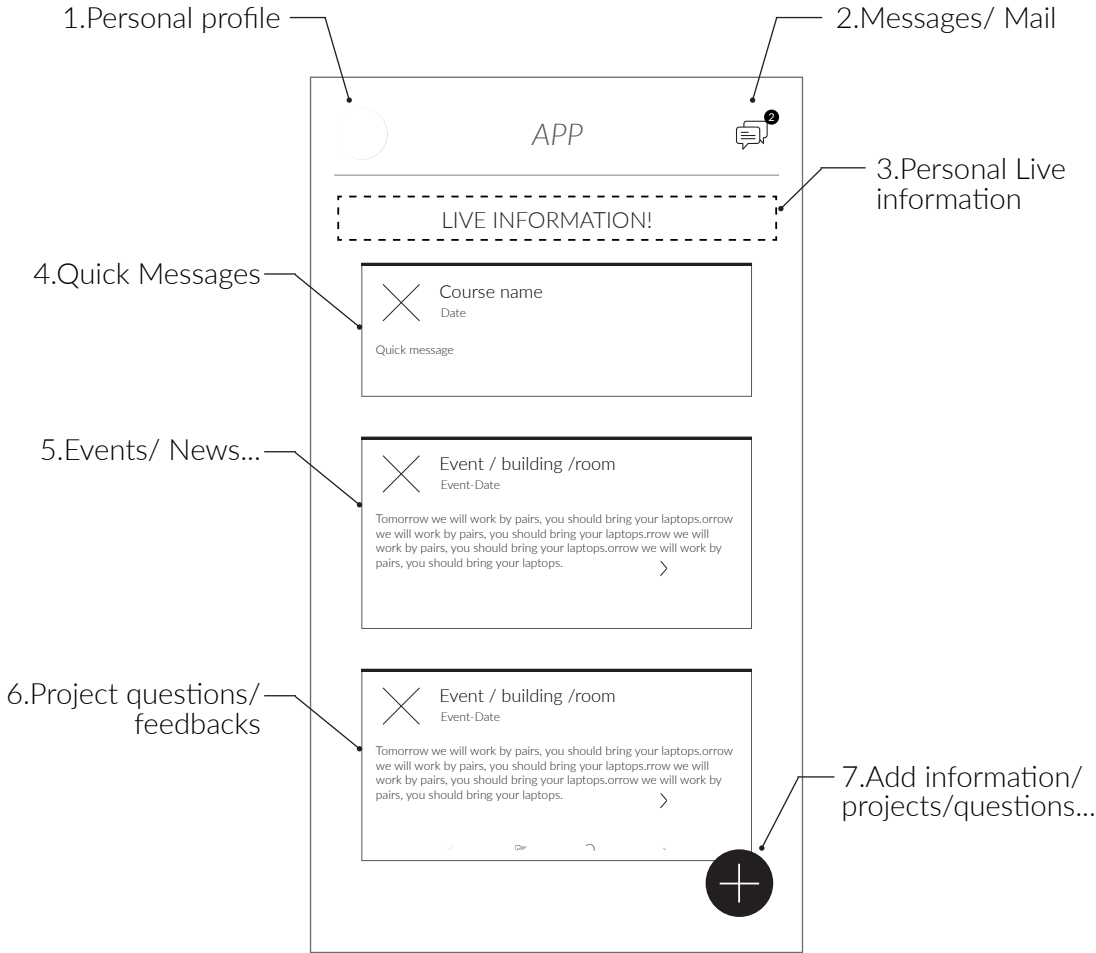
6. Project questions/ feedbacks

These kind of publishes are the last one and here the student take the importance, they has taken the responsibility of this section. If they want they can give information for their classmates, make questions, answer and help the others about their projects, exams...

This is a platform/app to help them to have an easy and better university experience. Get the best result from each one and help develop him in the best way.

7. Add information/projects/questions...

This is a simple button where will be able to add a message in the wall, you can decide what kind of message you want to publish, information, a question, show a project ... When you decided to publish something you have to know that all of your classmates will be able to see it and comment them. The comments are private only you could see them but the feedbacks (likes, stars, how many times they have shared it...)



4.4 Implementation

4.4.1 Prototype

Paper prototype, the first test was with a paper prototype, I took papers with iPhones printed and after I will start drew icons, boxes, text... to simulate like the “real app” in a quick way.

At the same time that I was making my first prototype I was doing changes I considered important. To get a better result I have been doing some quick interviews, where I ask what kind of icons do you prefer, Google or Apple? Do you usually check your profile in the apps like Facebook, Instagram...? What do you prefer between only text, text and picture or just a picture for explain a news or an event?... Simple answer but these were so helpfully for me and for the design. These are few screens, the final and most important that finally I used in the tests.

After the final develop and doing many changes I designed the final screens with the program Adobe Illustrator. I sent these into my phone and just the screen I ask users about the app, what can you do with this app? What do you think that this box tell you? And If I tell you where is the news? Or how can you post? Where?

With this prototype finally I had gotten the feedbacks about the symbols, icons, layout, structure, design... but I needed more information, feelings, feedback about the structure of the app.

I chose three students and I showed the app, this was the final test and I use my mobile phone with the simulate app. Then tell different tasks that s/he has to do, and I could saw what was the wrong parts that anyone knew to do. These tasks were:

- Tell me, who is your teacher of Usability?
- Post a question about your project.
- Check the message of your Paul teacher.
- Share a news of the main screen
- Change the language of the app.

The last step was create a final prototype with the program Justinmind, Justinmind Prototyping tool is an authoring tool for web and mobile app prototypes and high-fidelity website wireframes. It offers capabilities typically found in diagramming tools like drag and drop placement, re-sizing, formatting and export/import of widgets. I did the final screen in Illustrator and then I used Justinmind to create the final design.

4.4.2 User test

The last week of this period I did a user test, I was an afternoon with a student here in a room in the LTU and I was showing different screens, buttons ... Asking about the application if I was understanding the functions and structure and finally I showed several designs of screens to see which was the most functional, which was best understood at the time of graphic design.

Paper prototype



Figure 36 - User test Paper prototype

Paper prototype



Figure 37 - User test paper prototype

RESULTS USER TEST

Main functions

The functions of the app are 3, there is no problem with any of them, the users could understand the live information section, it is easy to know what it is telling you. Then the messages in the main screen, there are 3 types of messages, university, teachers and students depends the degree that you are studying. There were not any problems; the circles orange that notify the user what news are new the most of them understood in the first or second attempt, were the kind of messages what produced more problems. It is very important to indicate what kind is, the icon and the title. The quick messages were not any problems, it is similar an email app, that the reason that everybody knew how use it. The profile screen, the user can look the information about their courses, everyone knew this, and knew how can they look other courses.

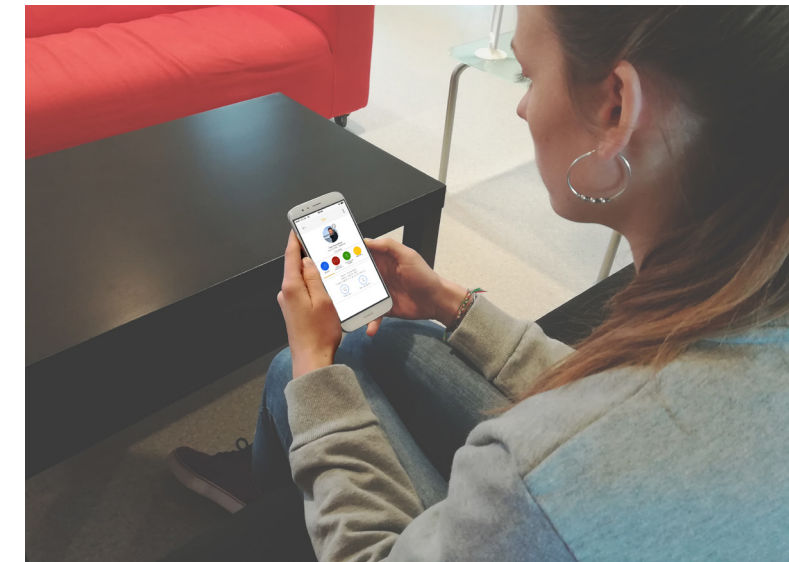


Figure 39 - User test Quick app prototype

Icons

They understood 80% of the icons. There were some problems with the new icons, they were not sure about the meaning, but after pushing once they said that is easy to recognize and they will know the correct use. The majority of the icons are common in others apps therefore, it should be easy to understand and learn.

Figure 38 - User test Quick app prototype

Structure

The last part the structure, Can the users understand the way to use the app? The main reason to have success in the design of an app is to be simple; the simplicity is: give few options to do, the fewer options users have, the less likely they will be to make mistakes. The principal problem is the setting icon, because it is in two screens, profile and quick messages and it would be only in one screen.

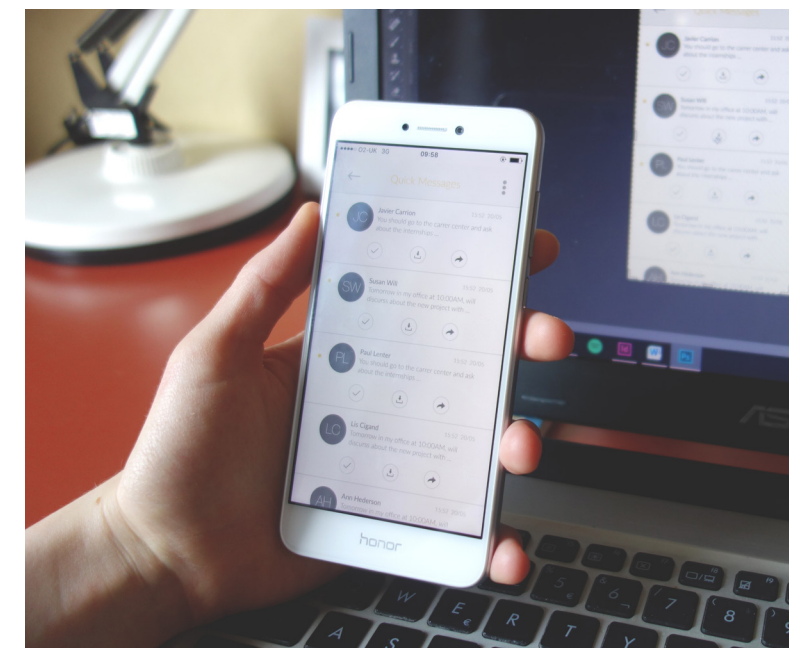


Figure 40 - User test Quick app prototype

A hand-drawn sketch of a site plan or map. The drawing is on a piece of paper with a grid. It shows various zones and paths. Labels include "check the office here" with an arrow pointing to a small building icon, "teacher post question" with an arrow pointing to a small building icon, and "collect" with an arrow pointing to a small building icon. There are also some other labels like "develop" and "methods" which are partially visible. A hand is holding a pen and drawing on the sketch.

FINAL DESIGN 05

FINAL DESIGN05

The finalization phase resulted in two different products that combine between them; The 4L methodology and the feedUback app. Both products provided the user with an easy, innovative design that will make the everyday life easier and interesting and a better experience in the university. These concepts are presented on the following pages, starting off with the 4L methodology. I have think that is better to explain first the different products and then the combination of both, it will be easier to understand the final result.

5.1 METHODOLOGY, 4L

The new 4L methodology is a new way to learn and teach in the university. The name comes from the main idea, the idea of creating a dynamic and innovative way to make every day different in the university and to help the students to develop their personal and professional skills besides teaching new knowledge, with four different kinds of lessons.

The main functions with these lessons are: Develop personal and professional skills, work in groups with different people, learn new knowledge and work on it to assimilate them and be able to make talks, meetings and presentations.

Let's start for the beginning, I will explain, why the skill development part is so important and then the four different types of classes.

SKILLS

What is this?

In this chapter I explain one of the most important parts of my thesis. First of all I would like to give you some reasons that clarify this section and then I will explain how I introduce it for the methodology.

Skills, an ability and capacity acquired through deliberate, systematic, and sustained effort to smoothly and adaptively carryout complex activities or job functions involving ideas (cognitive skills), things (technical skills), and/or people (interpersonal skills), this is the definition that the Business Dictionary gives.

Based on this definition I was thinking about how important it is to have developed skills and internalized knowledge, which was one of the reasons why I had to think about it and try to help students develop their professional and personal skills. *Kishore, K., & Mousumi, M. (2012)*

In the following paragraphs I will explain how I am going to combine these two parts.

The first one is the kind of lessons, why? The routine is one the worst things that a human can have... And in the

university is exactly the same. During the last decades the classes have been similar, the courses have the same structure and the teachers teach the same in the same way. Few teachers change the class for their students for other spaces, put in practice all the new knowledge taught or do different activities to motivate as students as themselves.

We have to change it! How? With a new methodology, combining different types of lessons during the semester: changing the spaces, the groups, the activities, more practice less theory and create a great mood all together to learn and teach. It is as important to motivate and help students as they are teachers.

There are four different kinds of classes, T+P (theory and practice), Workshops, Total class and M/P/F (meeting, presentations and feedbacks). I have explained them in the following page.

With these lessons I have tried to take the best way to develop skills,

What skills?

The skills I have been talking during this report and in the final explanation of my product are 8 different categories. Subject knowledge, Scientific competence, Design and develop, Problem solving, Communication, Project management, Personal qualities, Professionality.

These are the areas where I have focused the methodology are the most important competence, that every student has to improve and develop.

How can we develop them and obtain the best result?

The classes I am going to explain here below are the main reason. During the different lessons teachers and student will develop these eight areas. Depends on the activities, classes, lectures... they will focus in the different areas. Not all the classes have the material or the enough characteristics to cover the development of all the skills' areas but thanks to the combine of all of them, we will get the expected outcome.

T+P CLASS Theory & practice class

All together

1° Theory
2° Activities

Classes / spaces
can change

WorkCLASS Workshop & Activities class

All together & groups
One group lead/class

1° explain workshop
2° Activities

Open spaces
without chairs, tables...

TotalCLASS Complete classes

All together & groups

1° Explanation
2° Activities/groups
3° Presentation &
feedback

Ample spaces
Good equipment

MPF CLASS Meeting, Presentation &Feedback

All together & groups
One group lead/class

1° Explain the class
2° Start activity
3° Feedbacks

open classes
conference room

Figure 41 - Four kinds of classes



T+P Class

-These are the kind of classes more similar than we are used to have. Theory and practice practicing during the class.

-The theory is the first part of the class; the teacher will explain the theme and topics that he has prepared and after he will put in practice with his students the theory, simple exercises to memorize and assimilated the new knowledge.

-The best space to do this lessons are rooms with tables and chairs where students can be stay and concentrate with the teacher. The position of the tables does not have to be common in the classroom.

-There are many ways to place the tables in class, besides the change is good and avoids the routine that is a main cause of the demotivation

-The number of students can vary, depends if the class is only theory and few exercises the teacher will have to decide it. But if the class is more about exercises and problems than theory, the fewer students the class has, the better they will learn.

1, 45 Hours divided:

-1° part of the class the teacher explain what are they going to do this day, is very important to clarify the structure that they are going to follow during the class.

-2° part of the class after the presentation the teacher start the explanation about the theory, the best way to teach is doing the class more interesting with example, simple questions to get students involve. Couch their attention and have a dynamic class.

-3° part, they will do exercises and will try to solve problems, now they can stay individual or divided in groups, they should do well and try to ask doubts.



Work Class

-The duration of the lessons are not so long like the total class, the main of this classes is to develop the students' skills and at the same time help them to develop their projects.

-The space where these lessons could be big rooms with tables and chairs or not, this is not mandatory, as well as the class could be outside or in other space as in a mall or in a park. The idea is to develop new skills and to work in groups.

-The last main point is that there is not a teacher only a coach and the coach' role change every week. The first one (workshop) the teacher will take the coach role, he could explain well to the student the idea of these type of classes and give a real example. In the following workshop will be the students who are in charge of preparing them. In small groups they will have to think in different activities, explain problems, new methods to develop and design products... All that they considered interesting for the class.

2 Hours divided:

-1st part, the group: workshop manager will explain for the rest of their classmates what are going to do the next hours. An explanation about the methods and activities before starting and a detailed clarification about the topic they are going to deal.

-2nd part, the workshop has started! They will do all the activities that the managers have prepared and in groups (4-5 people) will have to do it.

-3rd part, Feedbacks, what is good? What was the best? What can we do better for the next one? What would you like to do the following workshop? This part is very important because the students have to feel comfortable and explain what they think, the personal opinion is free and we cannot criticize others of their thoughts / others for their opinions.



Total class

-Long classes with few groups of students (around 20), where students learn, assimilate and practice all the new knowledge taught by teachers.

-The best space to have this kind of classes is a big room with whiteboards and markers where there are no tables and chairs, where the imagination can fly and nothing stops it.

4 Hours divided:

-1° part of the class the teacher takes the important role and explains the students the theme or topic programed, during the explanation they can ask doubts and discuss about the topic.

-2° part of the class after a small break the students take the important role, now is time to put in practice all the new knowledge learned. The teacher proposes different problems and divided students in small groups (3-4 people). Now they have time to think in different solutions for the problem, develop it with simple draws and easy explanations, they can use all that they want to explain it. They can use material to do an easy prototype, making draws in the whiteboards... Develop new ideas, new solutions it is not allowed to criticize the ideas. The teachers will be able to help if the students need it but they will not be able to leader any groups because they now are in a secondary role.

-3° part, the last one after the long break. Now is time to the group presentation. They should make their best during the presentation and explain what the solutions are, what they propose for the problem, what should do in the future... all they want.... There are no limits.



MPF Class

-These classes are designing to take the feelings, the impressions, and the opinions of all the participator: students, teachers and professionals.

-The space to have the different lectures can change, the meetings could be in big rooms with space to make it in a good way, like a main hall or in a conference room there is more serious and we have to get used to talking in big rooms and spaces.

-There are different ways to approach the lessons:

oMeetings: In small groups or individual, students will have to prepare a presentation about one topic (related with the course and that they consider interesting for the others). They have to present at least once during the course. They must be present at least once during the course. It is mandatory because they have to lose the fear for the presentations. Moreover it is interesting to have some meeting with professional in the field because the own experiences motivate people and is easier to pay attention and internalize.

oFeedbacks: During the course they will develop different projects, the most of them will be in groups because we have to learn work with others (Is the future) and not only our friends, different people in the future you are not going to choose your co-workers. So to help the groups to develop and get the best project it will better if we have classes specifically for that. By groups they will explain the ideas they have, what is the approach they are giving to their work. Then their classmates and the teacher will try to help them, giving their opinion and some advices. The main idea of these classes is to help the students to take the project up to date, update it every week if they are not likely to leave it for the last few weeks.

oPresentation: The last and most important part in a project is the presentation, is like a showcase. To have a good result, and a good presentation you have to prepare it, It is no easy so we have to learn how to do it, how we can lose the fear and concentrate in our project, forget that there is a public. For this will practice in class, informal presentations with less public and little by little we will be able to speak in public with a big audience.

If you can explain and present it in an easy and clear way, the public will understand it and your project will have a good acceptance, besides you will be proud of yourself.

5.2 feedUback App

The second design consisted of an app for smartphones and tablets, with a variety of functions that aimed to improve the university experience for students and teachers. The main purpose of the app was to gather and summarize important information in one convenient location, as well as to provide an effective and quick way for students and teachers to interact with each other.

I will start with the home screen explaining each function, icons, pictures, texts... and then I will explain the secondary screens, profile, messages, settings...

Main screen

The home screen is where we will find the most important information; this screen is divided in three different sections.

The first one is situated in the top and this has just 3 symbols, the first is a circle where you will have your profile picture and if you click there you will go to your profile, where you will have more information. In the middle of the first part we will have just the name of the app; this is not interactive so if you touch it, will not happen anything. And the last is a simple icon which refers the messages, private messages; this is interactive so if you touch it, the app will go to the message screen where you will find all the private messages with your teachers, students and groups of students. When you enter in other section like the profile or the message

then when you want to come back to the main screen, in the top of each screen you will find an arrow symbol with that function.

The next section is situated just below the first and has the function of giving each user him / her personal live information. The live information refers to what it is happening now, in this moment or in the next hour, important information that everybody needs every day. It is just to get very quick this information because it is important and sometimes we waste a lot of time to know the class, the timetable, the teacher... We will know before the information and it will be better for all of us. This information is connecting directly with the university serve like CANVAS is like other platform so the information will update by itself (with the University's server). Maybe this section may seem an icon, it is. If

you press it, the app will show another screen when you will see you timetable, the classes, hours, assignments... personal notebook.

The last part, the third section occupies almost two-thirds of the screen, this means that is so important and it will give and provide the users the last main function. This part that I have called FeelWall has different kind of messages; all of them have the same characteristics, quick messages with an easier and simple answer, gives information about the university and the department of your degree/master. All the walls have three different kinds of message.

The first is about the university, it is a common message for everyone who has this app and here in this section will be the news, events, information... related with the university that affects all the students. Just below the information you will find one small icon (+) , it will give the user more information if s/he wants about that news moreover you will find 3 icons, the first (in the left) is a tick, if you press it, it will be like: I have read the information! It is only to have a quick feedback about the readers, how many people are reading the news. The second icon is for save the news, document... if you press it, automatically this will download in your mobile phone. The last icon is to share this information, when you press it, it will show you another screen with the different options to share, in which app, with whom...

The second kinds of messages are information that your teachers and the area that you are studying want to post. Here depends the courses that you have taken you will have messages or not. This section has the same icons than the before, to check, save and share.

The last kind of messages are the students feedbacks, these are private messages. These messages are the students the liable to publish them. How is it work? The student have the control of this part, they will be able to publish all that they want, events, questions, news... but the main function is help them to have quick feedbacks about their "university life" projects, meetings, talks... all that they want. The messages will be publish like a survey so they always have a feedback about their news-letter. When the students will publish their questions or information they will decided who will be able to see the information, classmates and teachers for one of him/her courses or two different courses, always the teachers and all the classmates when you publish something they will be able to see it.

In the low part of the screen it will be a big icon to publish the messages, where you will be able to choose the kind of messages, who is going to see it, the title, pictures, main text... and what kind of feedback do you want.

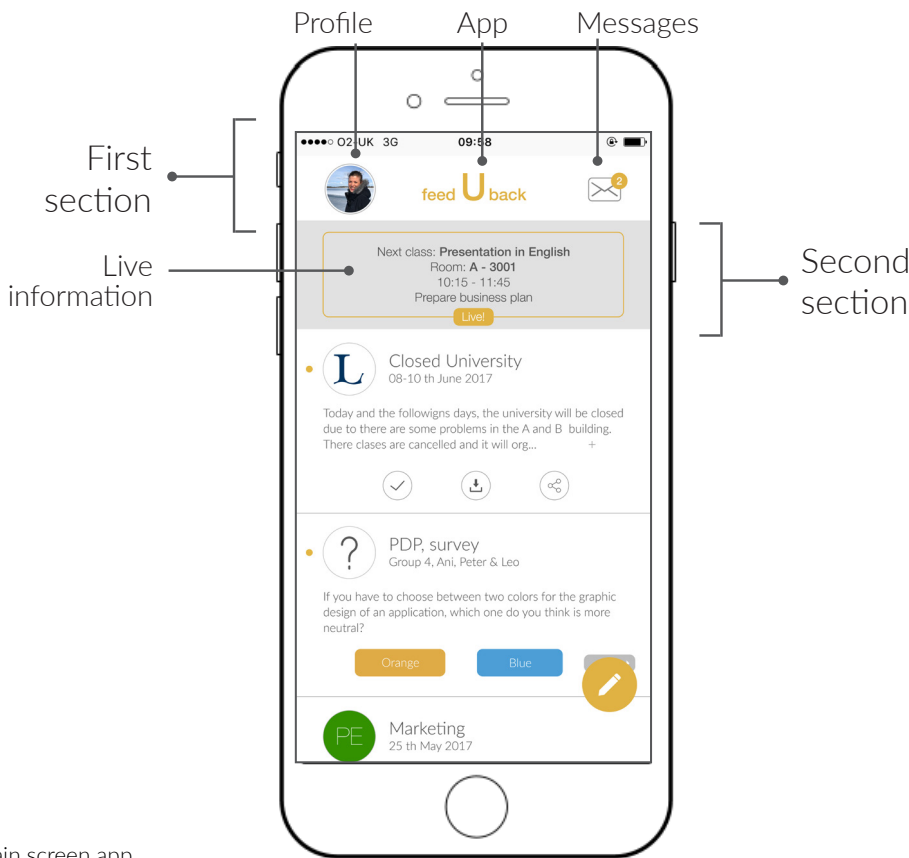


Figure 42 - Main screen app

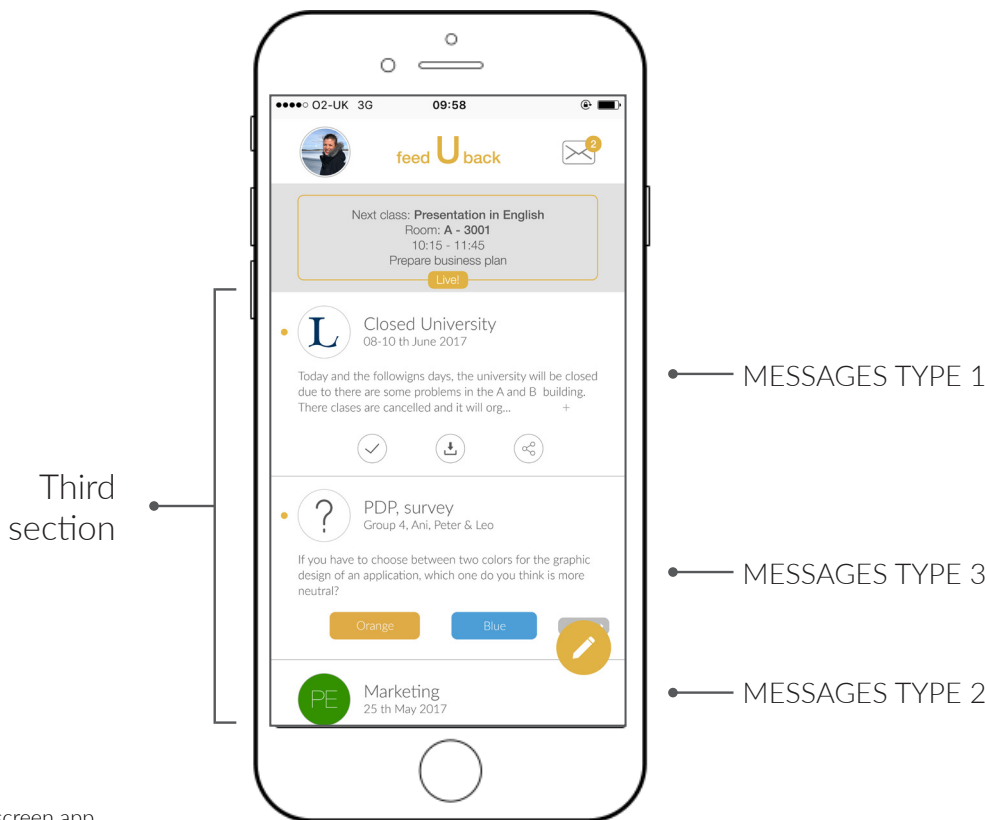


Figure 43 - Main screen app

Profile screen

The second screen is the profile. This screen has different sections; the first situated in the top is just two icons, in the left an arrow symbol with the function: take the user back to the main screen, the second is situated in the right and it is three small circles, here you will find the settings. In the middle only the name of the section, profile, just to show here the user is.

Just below the second part, your personal information, picture, name, and degree. It is here a small icon where you can change this information and the profile picture.

The third section is showing your courses in that quarter or semester that you have taken, I have explained before that this app is connected directly with the university serve so the courses and information update itself, you do not have to do nothing. In this section there is a thin line below the names of the courses, shows you that you can click in the courses ad it will happen something. Yes, you are right, the third is combine with the forth section.

The forth section changes depends where is the thin line situated. In this part the user will see different information about the course, the teacher, the office and the time in the office. Just after the next assignment and next class of that course. Main information that helps the students to have a better day a day in the university. The third screen is about the messages. Teachers and students can send mails in a fast way.

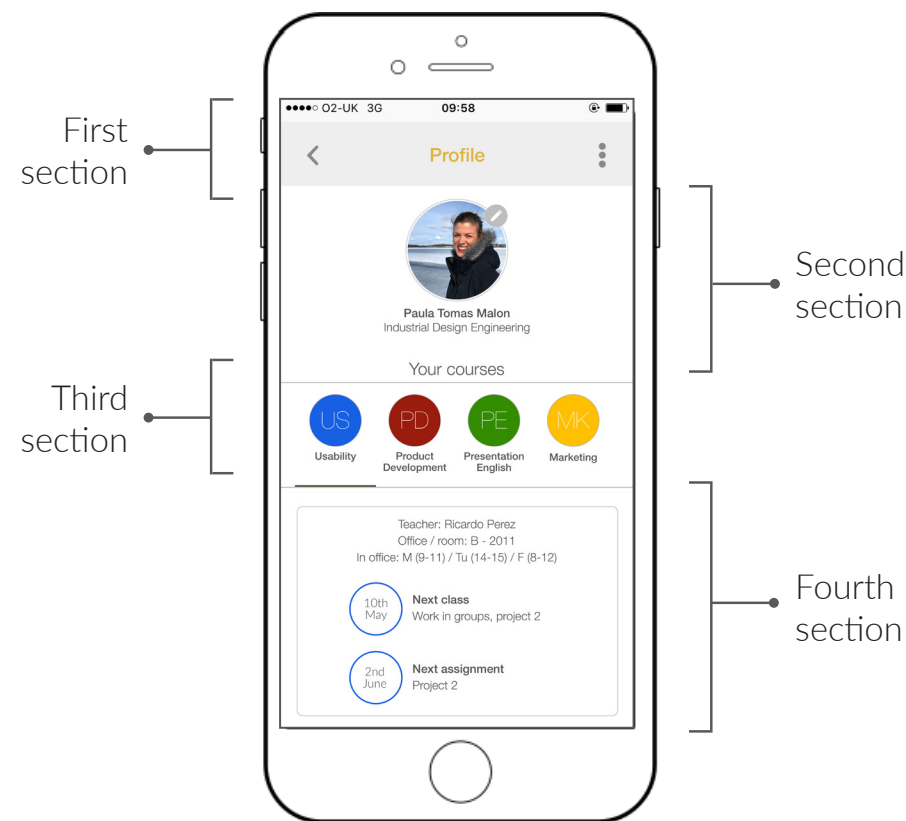


Figure 44 - Profile screen app

QMessages screen

It has two sections; the first is like the one on the previous screen, with two icons and the name of the screen. The functions are the same. The second one is the most important.

The screen will have the same layout of an email app, because this screen has the same function and if it looks like a mail application, probably a greater number of users will be able to use it.

The section will be divided in the messages; all will have the same structure. I will explain one layout of one message the others are similar.

In the left it will be a big circle with the initials of the name and surname, in the top it will be the full name, in the right the hour and date of the message, just below it will be the beginning of the message, one line and if you want to see it totally, click here and that's all. You will go to other screen only for the mail, where it will be the functions to reply, share, save...

One problem that we have are the quick answer for the messages, sometimes we send an email just to send important information or saying yes or no for an another mail... a quick answer it is that we need it.

So just before the mail in the main screen we will find 3 icons. The first and second are exactly the same than in the main screen, the tick and the save icons, they have the same functions. To tell the teachers or students that you have read it and that's all, you do not have to reply nothing. And the second is to save the message. The third one is to reply the message; if you click that icon it will appear other screen where you will answer in a quick way just few words to the teacher that has sent you the previous mail.

It is a quick way to have contact with the teachers, you do not need to enter in the website, in your profile, then go to the mail or online platform and check the information. This has few steps and is easier to understand it.

BUT!

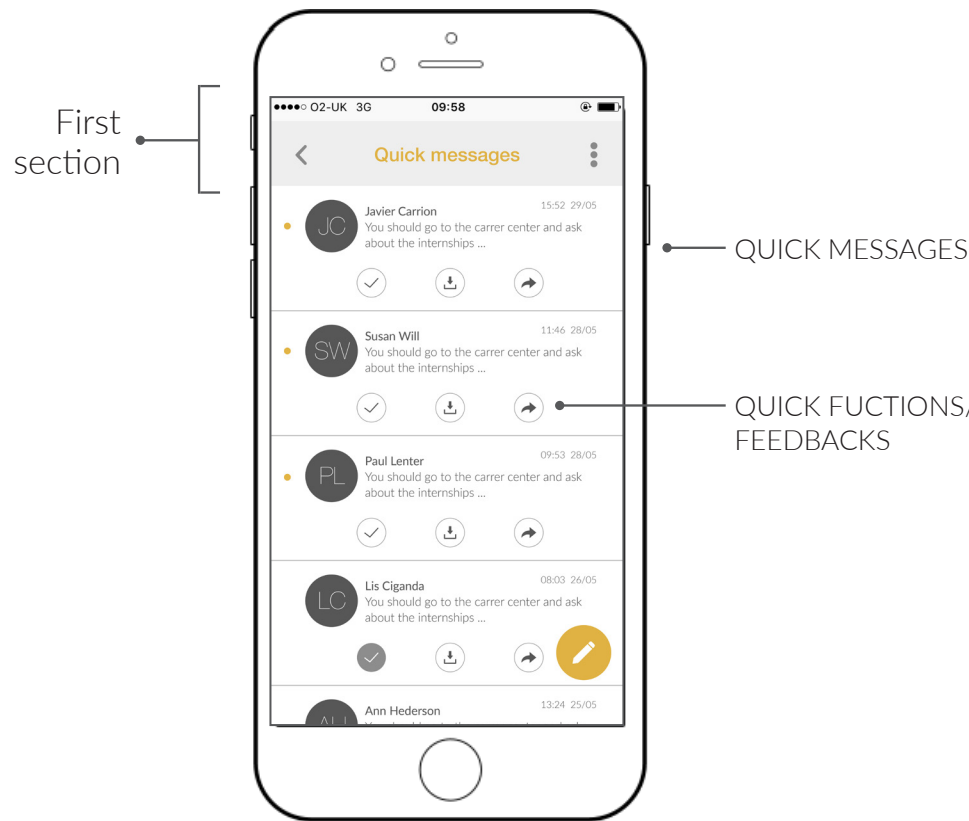


Figure 45 - Quick messages screen app

5.3 THE COMBINE

The first and the most important idea was: improve the learning experience in the university. This two new service will improve the university life for all the student and teachers, there is not matter what degree or master are you studying. These two products were developing to solve the needs and the problems that users had. I have had the opportunity to learn in a Spanish and Swedish university and to have different experiences in each university. As I explained in chapters before the life is very different, the relationships, the needs, the facilities... and these were the main reason that I have tried to develop a new product or combine of products that will be able to give the opportunity to have a better university experience. Then I am going to explain each one and the relation between them.

The methodology will give the opportunity to learn and teach in a better way, avoiding the routine and developing at the same time personal and professional skills for the future. The four lessons are templates where the teacher can find an inspiration for his/ her classes. I mean sometimes teachers needs help or inspiration to be different to motivate their students because we know that it quite hard to do it very well during one semester or quarter, but thanks to these templates they will develop an interesting, different and motivate course for their students. The main different in these classes if you compare with the normal ones is that here the students will develop their personal and professional skills and abilities at the same time that the knowledge. As I have explained the development of our persona has the same importance than the theoretical knowledge. So if we

during the course can develop all that we would like to, the students will be more motivate, will learn more and the teachers can be update their techniques of teaching and growth with their pupils.

The app will give the students and teachers the opportunity to be update of all the different events and news in the university and related issues. What is happening now, what will you do the next week? Which assignments do you have? ... The main reason to develop this app was because is the faster social media nowadays and if we are so interesting into know what is happening in each moment in real time, we should have the information in the system that we are always using... the mobile phone. As well, the app give more functions to the teachers and students, the project has been focusing

in the improvement of the university experience, and the communication among the users has the same importance than the classes and lectures. If we can have better and quick communication, we will have a better university experience.

The next picture is an info-graphic that I have design to explain the final result of my project. In it is explain: the combine between app and methodology, the relation and how they can help and complement each other. At the same time I have tried to represent one real course in the university, the student and teacher life separately and how they connect among the university and how their communication and connection is during the classes, in the teacher' office and at home.

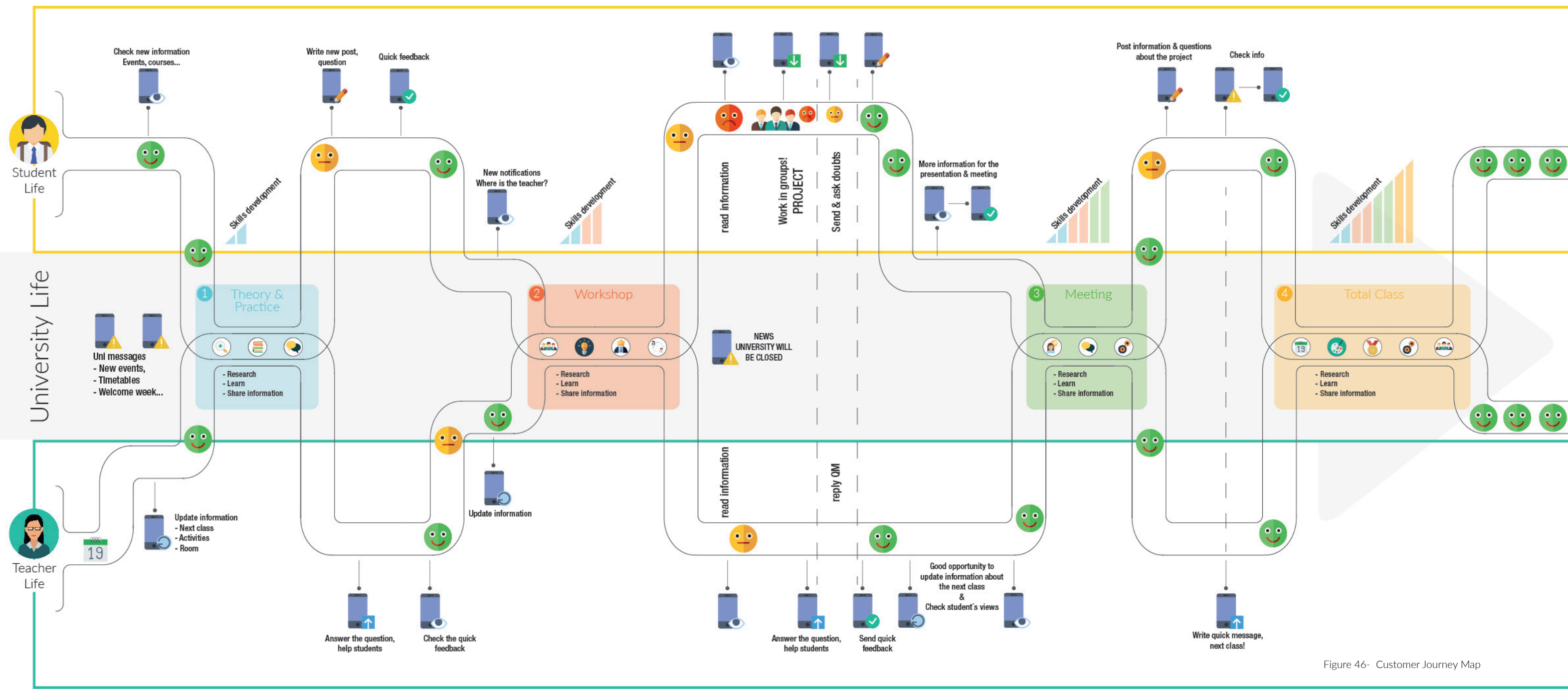


Figure 46- Customer Journey Map



DISCUSSION 06

DISCUSSION06

This chapter will discuss the final result. It also discusses the relevance of my work, my own reflections around the result, but we have to know that this project is different from the others. The methodology and the app developed are intangibles products, I have tried to define as much as I could during the process but probably it will be able to define more details, and make changes that will improve the product.

6.1 FINAL DESIGN

The result is a design based on the needs and preferences of the stakeholders. The work in the project show the benefits of combining the fields of service and interactive design as argue Austin Brown (2012). As designer I have been working in the user needs in their learning experience in the university.

Two teachers of my home university in Spain were discussing with me about the service in the university, what kind of service the students and teachers receive and what could be improved. They gave me the opportunity to start a new project in this field because anyone before had developed something similar and the EINA (Engineering school of Zaragoza) was interested in this research as well.

The critical step is... understand the **real problem**

The critical step of design work is to understand the real problem before even starting the design of a new concept (Cain, 1998; Glomann, 2015; Norman, 2013). My teachers come to me with an interesting proposal, they told me: as you have been studying in this university three years, you will have your own experience to start, and then you will have a student approach about the facts. We know how to do it but we need a student approach that gives us another point of view in this project and research.

The final result has been thought for university' users, trying to gain a better learning and teaching experience...

It is time to evaluate the results obtained in the final design chapter and interpret them. The result of this project has been a mobile application and a new learning and teaching methodology.

In the theoretical framework chapter I was talking about the service design. What kind of service the university gives for the students? Is it enough? I have been trying to answer these questions during all the process and finally I have found one solution that gives the opportunity to have a better experience in the university for all the

students and workers. The main thing was improve the learning experience and help students to have an easier day to day. The user experience, how I have just said it one of the most important things during our university period; what kind of knowledge do we learn? How do we assimilate them? Is it just one way to learn? How I have explained in the second sub-chapter there are many different ways to learn, travel, meetings, experiences, making mistakes, workshops...

Not just the classes are important, the relationship among students and teachers, visual design, spaces to learn... exist many aspects that are important and we rather considerer.

Other sub-chapter very interesting in this project is design education, how many years we spend to learn? There is a problem, there are a lot of people that think that just in the school or university we can learn, or we learn more during the rest of their life but just the experience in a personal area not in the professional. I am going to clarify that, how I have said in the second chapter, there is a collage in USA that their students are professionals, professionals of 40 years that they want to learn more and update their knowledge. I mean it is very important to update ourselves, the world changes very fast and the technology, the problems, needs change every day so we have to prepare for a changing future, the methodology that we are used to use in the university are not enough to prepare us, so Why do not we try to change it? With my methodology I have tried to change it, and develop a new approach of the learning field.

6.2 RELEVANCE

If students and teachers could have a better experience in the university, they will be more prepared for the life and future. They will be better professionals and the personal satisfaction will be higher.

Since the technology has been changing and improving the education has been developed more slowly. It has not had big changes in the way to teach and learn. We need to refresh and update the knowledge and the methods.

This new methodology will be improving the success in the university and it will help students to get all that they want and propose. Not each student know how they should develop, change, improve their personal and pro-

fessional skills; there are fantastic students and teachers that they know it more than others, but this change will help everyone.

The users will be able to have different experiences that they will learn more. In the future they will need to know how they should explain a product, work in groups, lead a meeting, prepare a talk, think in solutions... With this methodology you will be able to learn all this new knowledge for you and assimilated during the activities (workshops, total class...). Besides, there is another product that complements the methodology: a mobile application. The title of my project is, improving the University learning Experience-Service design of a framework for learning, with the new methodology it is cover the learning improvements... but the experience would be better. The students will have an app that will give the information that they need each

programs can help you to explain and show the results in a better way, and help users to know how it will look like.

Furthermore, we have used visual presentation as a tool for communication among people from different background with diverse perspectives.

6.3 REFLECTION

In this chapter I will give my point of view during the project, will explain the reflection in the process and the results. I will start with the process and then the final design.

The process I have followed has six steps: empathize, define, ideate, prototype, test and implement. I have done all the steps except one, implement. During the last five



Figure 47- Discussion different ideas.

day. I have explained, the app has different sections, where the users will find information related with the university and their courses.

That is why the new service will help, and they will be important in the future. Is a service that we can implement in different courses, and will embrace all the universities degrees? That's sounds interesting.

Moreover the prototype I have developed with the program: Justinmind will give the users a real feel when they will use the app. I have tried to make a prototype that shows the main functions and with a good graphic and interactive design

The work in this project has shown that prototyping methods like rapid prototyping and application simulation

months I have been developing the product and I have tried to follow this process in all the period but sometimes it was not possible. I have had some problems that I had to solve and think again other solution so in several times I have used an iterative process, I mean when I found the problems, mistakes that I had done I went to the step before and looked a new solution. I have explain this part in this report but I would like to highlight that in my opinion this is not a problem or is obstacle, you have to take as a challenge, something that you must overcome to continue and make it better.

I have had different feeling during the process, when I was starting it was like I have enough time to do it, let's start! Then the weeks were passing and the mitt presentation was close... then the panic started but I had done almost everything that had marked in my planning.

Here I would like to say that I have had to spend a lot of time in the researches, reading, analysing, speaking... so much time that I needed because it was an area that I had never researched so I had to do it.

The ideation and development phases were doing in less time that I would like it... As I have just said, I had to spend so much time doing the first phases, and I was motivated to start the next phases but I had to work hard and a lot because if not I was not going to have enough time to finish it. During the last weeks of the development phase I was starting with the prototypes and the tests. This was the best idea because I could make changes in time and get the best solutions.

In my opinion the result obtained is good, I know that it is not perfect because that is impossible but is a good and correct solution for the problems and needs that the students and teachers have. I would like to have something more innovative and make bigger changes but I am happy with the results that I have obtained.

6.4 RECOMMENDATIONS

First of all I have enjoy like to say that my project has been developed thinking in the future. It is a service that the university will give so I have done a prototype and I have tried to design a real customer journey map, to approximate the feelings for the real product. It is quite complicate so for the future it will be perfect if the university try it during a period of time in more than one course. We will have to put in practice, try it and then we will be able to see what the main points are, what are essential and what we have to change... The real implementation in courses with students and teachers in a university is the last step that my project needs.

It is obviously that it will need changes and probably before the real prototype. I would like to have professional opinions, teachers and students' opinions as well. All the perspectives are welcome and for me and my project it will be a good opportunity to correct the mistakes and do it better.

To conclude this chapter I want to say that I would like work in this project or this field again and try to develop the best solutions for us, because the knowledge is one of the most important things in our live, part of us is just knowledge, and we have to take care it.

CONCLUSION 07

CONCLUSION07

The project objective was to improve the learning experience in the university. This section will answer the research questions based on my objective with support from relevant theory. Furthermore, I will verify that I have achieved the objectives and aims of the project.

7.1 RESEARCH QUESTIONS

1 - How can service design inform and contribute to a better university learning experience?

Learning is more than just know new theoretic knowledge. The service that the university offer, it should be more complete. I mean, they give us the opportunity to have different lessons, participate in events, talks... but when we talk about the learning experience in the classes, we just speak about the common lessons, with the theory and activities. I am not saying that they should give something material or more attention during the courses, I am saying that to have a better learning experience, the methodology has to change. How can be better the experience is the answer that I have been trying to find. After the interviews and researches I got different results, there are a lot of problems and needs but the common are the lack of innovative methods, more activities, experience, better flow of information... that are the points that we have to improve and make better.

It is a learning experience for the future; it will have to prepare us for the future, what it is going to come... The way to work and learn nowadays does not provide us all the knowledge... We lack develop in our abilities and skills.

That is why the service has to change. Change the learning methodology, add more activities, events, experiences... that will give users the enough capability to develop themselves and become the best part of them.

2 - How would an ideal learning framework ought to be?

The first step was to think what is wrong now, what is not working. One of the main problems is the routine; we have to escape from it, and go beyond the common. A new methodology is good for teachers and students. Learn more than theory, theory is good but not enough.

The learning framework would be an open methodology; I mean an entertaining and flexible methodology, where teachers could decide what they want to do each day. The main is to have different types of classes, the teachers could choose which one they want to put in practice each day during the quarter or semester and in

the end of the period, the students should know more than the knowledge and they will develop at the same time personal skills, working together, leading groups, presenting their projects...

Just the marks is a simple way to speak about ourselves, we are more than the university transcript, that's another reason to change. We must develop what makes us each different and unique, to succeed in what you wish.

3 - How can the user experience be improved at LTU and UNIZAR?

Besides the new methodology, to improve the experience in the university I should develop something more...

Students need more information, relevant information for them, depend the degree/ master but they have to update and check every day what is happening in their university. Facebook has a lot of different pages in where we can find interesting information but is just for specific events... and it is not related with the university serve.

The experience in the university lasts between 3-5 years. So much time, that we will have many opportunities to do different activities, go to events, learn more about interesting topics or just have an easier day a day in the collage.


All of this it will be easier for us if we have an app or platform that gives us that information. Why an app instead of a platform? Nowadays we are used to use the mobile phone every day and we check apps like Whatsapp, Facebook, Twitter more than once per hour and the platforms are more comfortable to open them in the computers and we do not use the computer as much as the mobile... That is the main reason that I decided to develop an app.

A quick app that give us the opportunity to know more about what is happening in each moment, in the university and in your university life. A personal app with different functions, it will provide live information, news and events in the university, and in your courses... quick way to get in touch with teachers, quick information about your courses, next classes, next assignments... that would be the perfect combination for the students, all their needs will be cover with these two new services.

7.2 Project objectives and aims

The overall project objective was to design a new service to improve the university learning experience. The project aim is to enhance the experience for both students and teachers by improving their work- and learning environment, contributing to motivation, and introducing new and innovative learning tools. As argued under the previous three headings the delivered design fulfils the objective on all three points.

With these two products, I have achieved the proposed goals. We will have a better experience in the university if we learn more than just courses and develop ourselves. The aims like improving the work and learn environment, motivation, new innovative learning tools have been solved with the 4L methodology. Moreover the app will help to have a better daily experience in the university.



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APPENDICES

A PLANNING

B TEMPLATE PERSONAL INTERVIEW

C INSPIRATION POSTERS

D SURVEY

E METHOD SELECTION IDEAS

F MORE SCREENS APPS

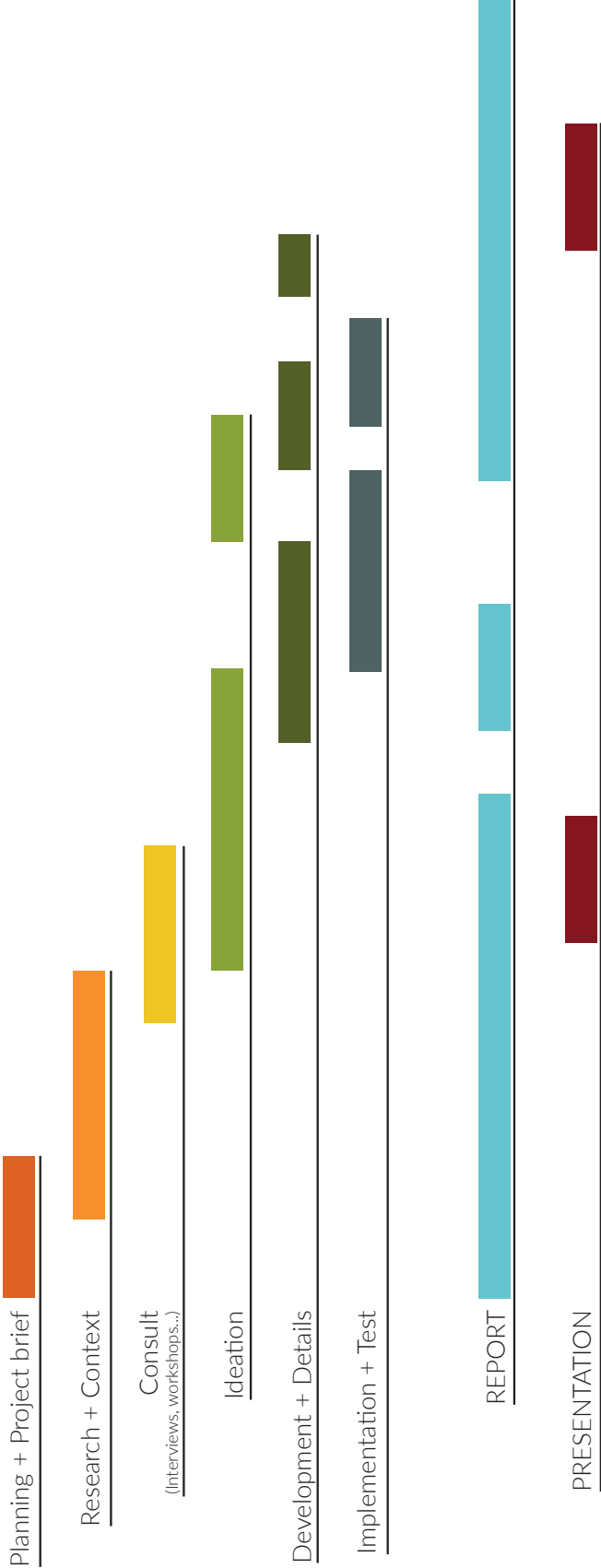
G PROTOTYPE

H JUSTINMIND

I INFOGRAPHIC

APPENDIX A . PLANNING

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21



APPENDIX A . PLANNING



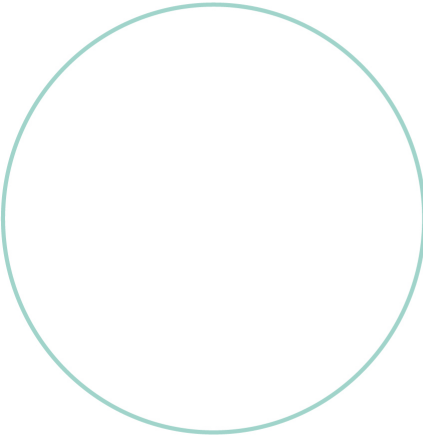
APPENDIX B . TEMPLATE INTERVIEWS

My name is ...

One sentence to define the best of your degree:

“

”



Write 3 adjectives that describe you

If you were a teacher how would you teach your students?

Which of those are the most important things for you in a degree

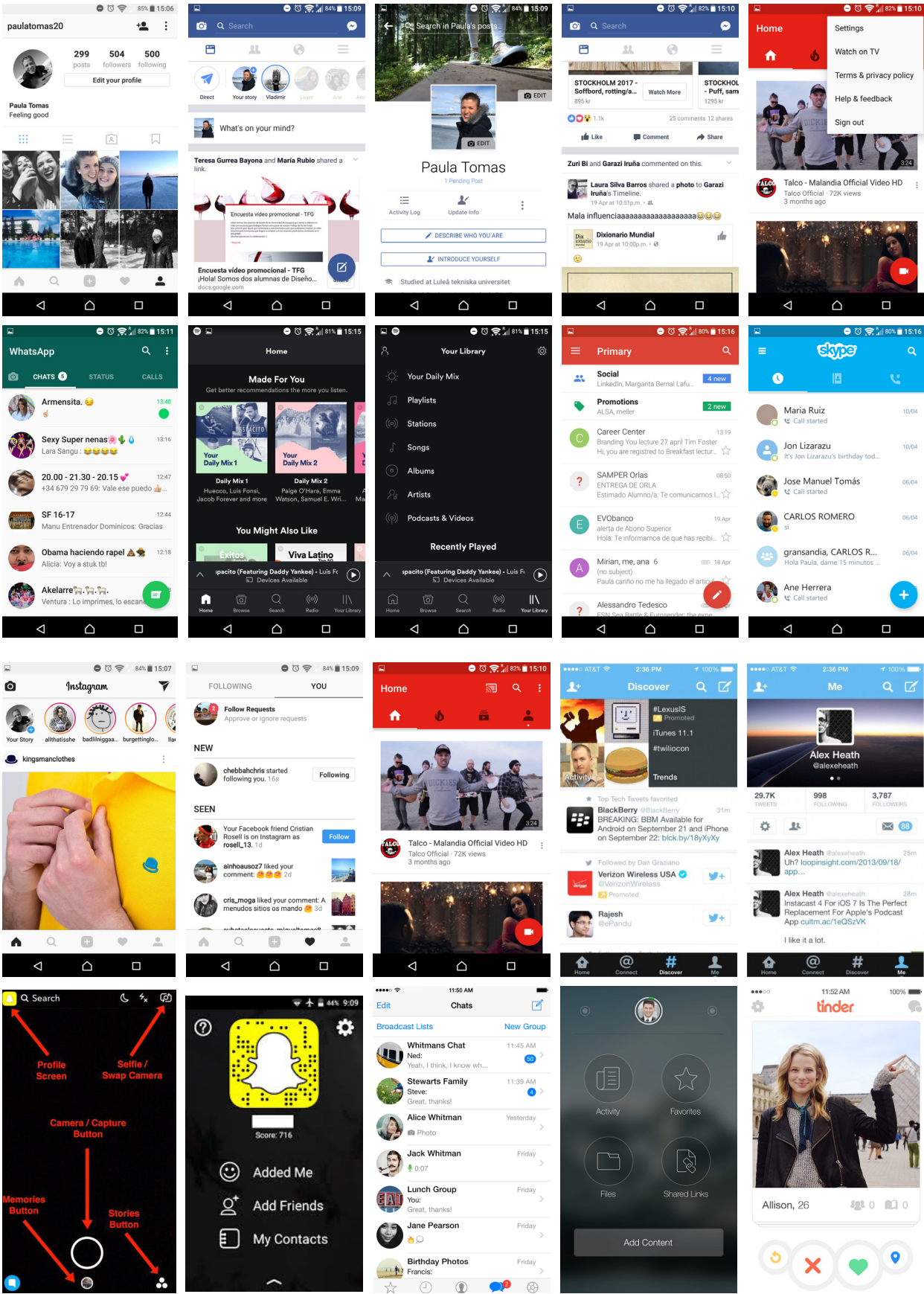
- | | | |
|-------------------|-----------------------------------|---------------------------------|
| Daily work | work in groups | Individual projects |
| Exams | Relationship with your classmates | Feedback |
| Practical lessons | | Relationship with your teachers |
| | work with a real company | |
| Workshop | Theoretical lessons | Correct in class |

what would you like to change about your learning tools, at the university area





APPENDIX C . INSPIRATION POSTERS



APPENDIX D . SURVEY

ONLINE PLATFORM SURVEY

1-In what country do you study at the moment? City?

2-Does the university provide students and teachers with an online platform like Moodle, Canvas...?

3-Which?

4-Do your teachers use it?

5-How often do they update it?

6-How many times a week do you visit the virtual platform?

7-Do you communicate by email with your teachers?

8-Could you say that they are quick to answer? How many hours / days do they normally take?

9-When you have to solve doubts, do you prefer to solve them in class, go to the office or by e-mail?

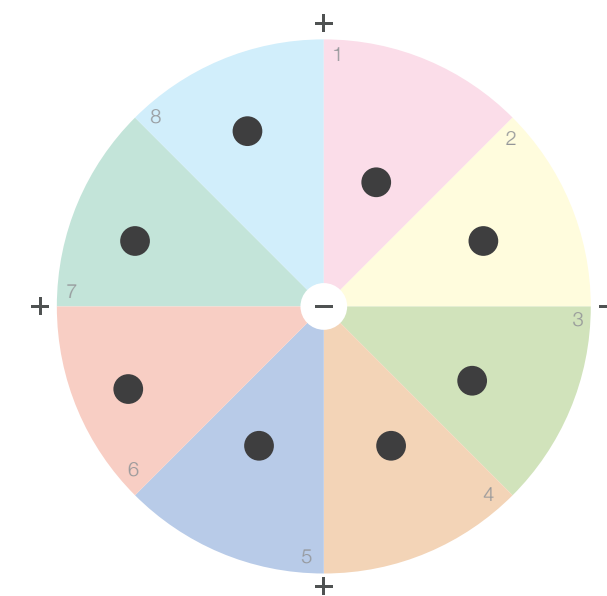
67
answers

D1

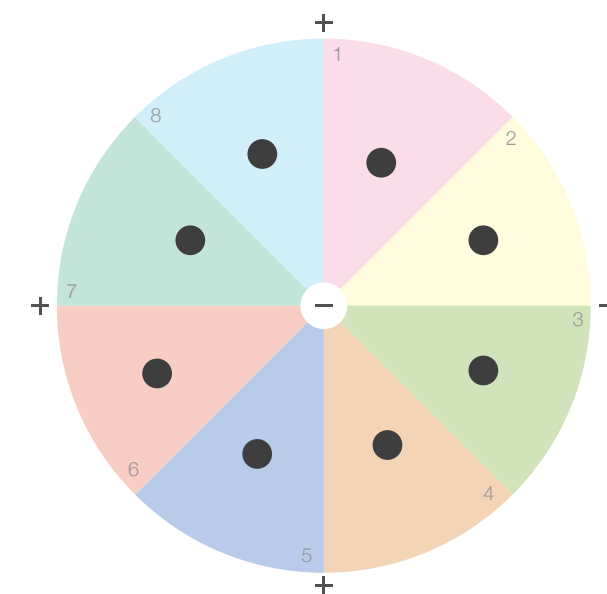
APPENDIX E . METHOD SELECTION IDEAS

These are the other two result of the concepts in the selection method, it is not so much clear than the other concept had won because all of them where very interesting to develop but the area of the first was bigger and that was the reason to win although finally I took some ideas from the others two concepts to develop the final one.

Concept 2

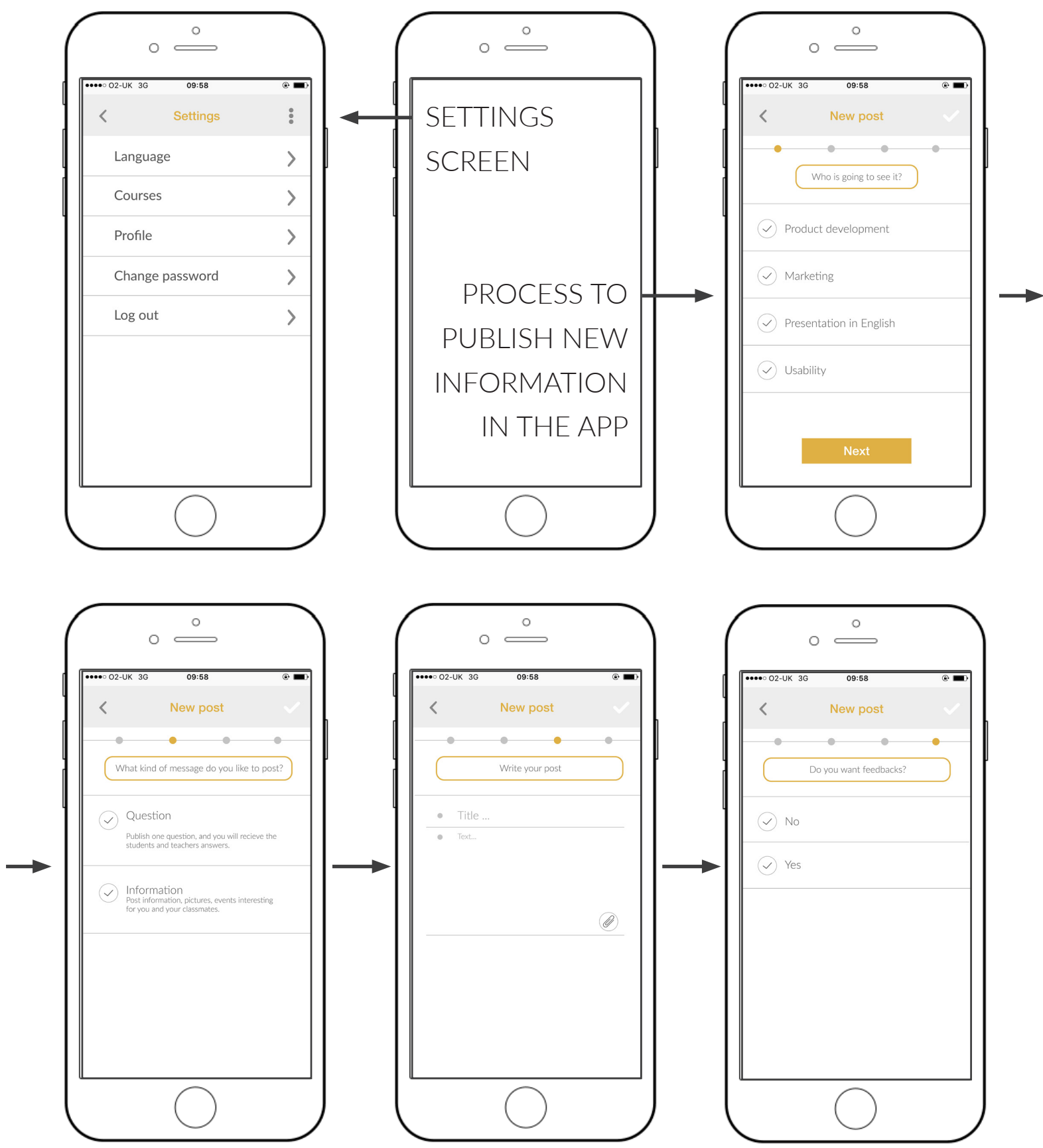


Concept 3



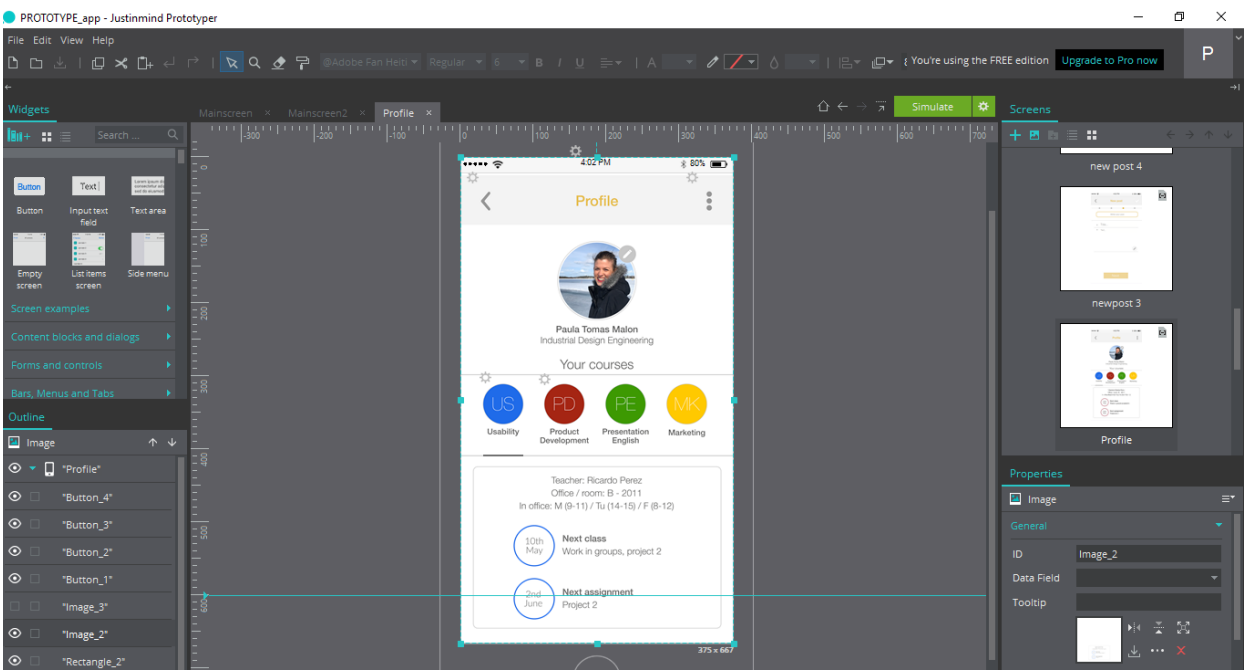
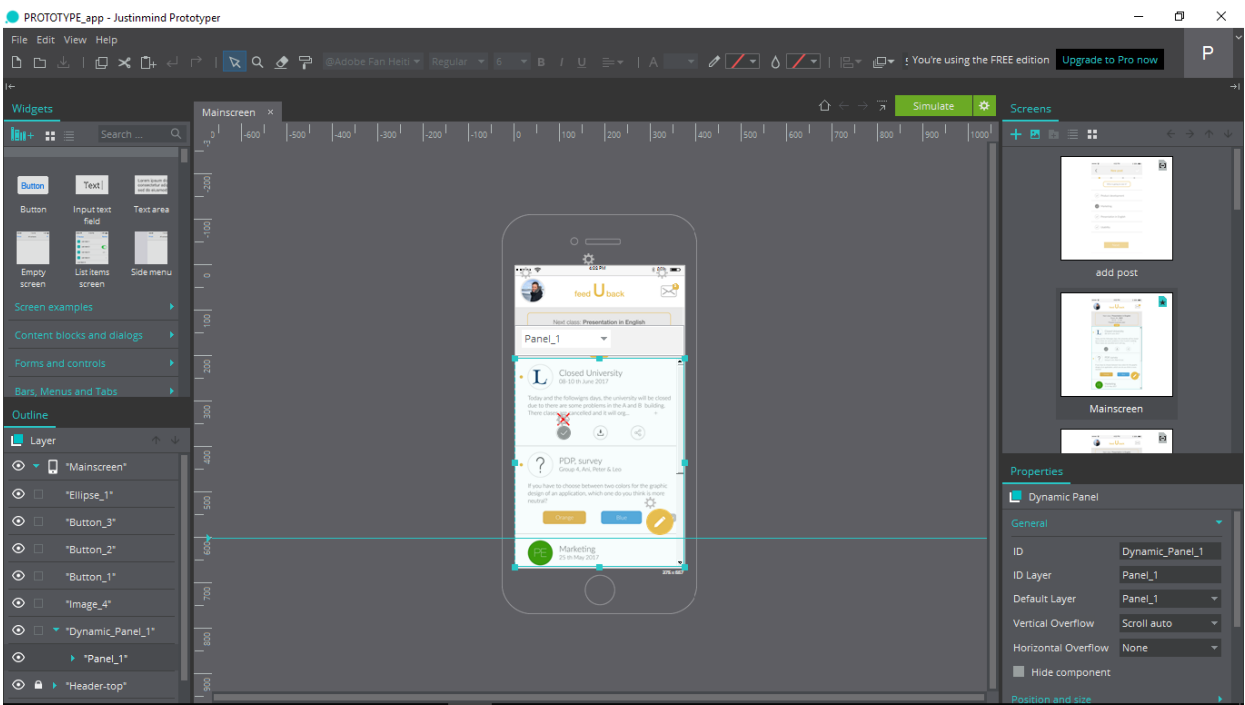
E1

APPENDIX F . MORE SCREENS APP

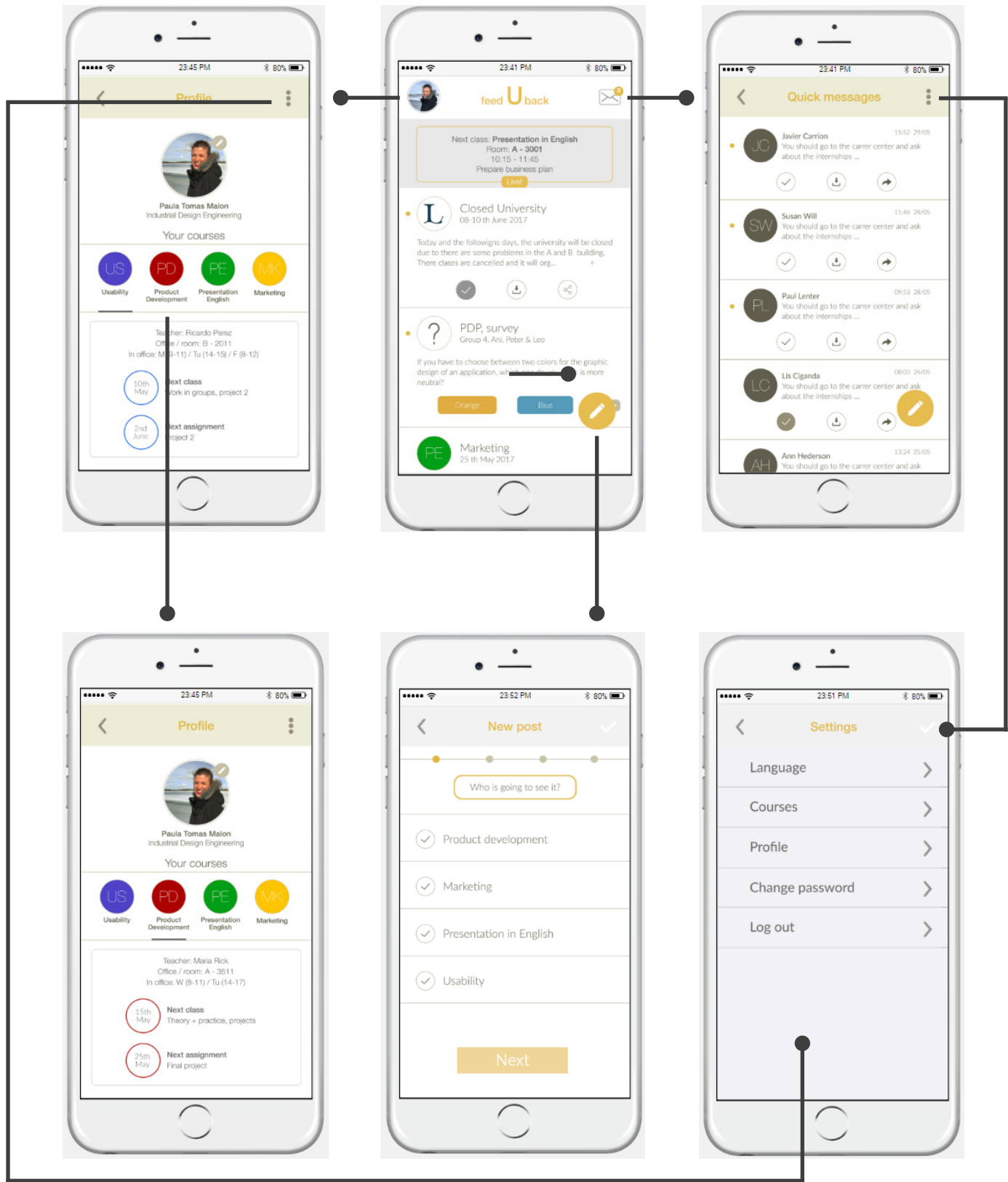


APPENDIX G . JUSTINMIND

JustinMind is a program, where you can create easy and quick prototypes from mobile phones, tablets, website... I have used this program to create the final prototype with the final screens, in the most real way I could. The platform is easy to use and understand, it has different options, proprieties, events, templates... where the user can do amazing things. These are two of the different work-screens I used during the development of the final result.



APPENDIX H . PROTOTYPE



APPENDIX I. INFOGRAPHIC

APPENDIX I. INFOGRAPHIC

