UX IN DESIGN STUDIO: INSIGHTS FROM STUDENTS' EXPERIENCES OF A STRUCTURED DESIGN PROCESS

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Abstract - This study aims to find out how undergraduate ID students experience a structured UX design project, which they undergo for the first time during their ID education. We conducted a focus group study on students' experiences, opinions, and problems they faced during their recent UX project. Results show that they strongly benefited from the structured process and methods we provide since they are unfamiliar with UX design processes and methods. In addition to this, they find it more beneficial to be thought about the methods that we suggest using at first and then adopt them into their process. We discuss the new ways and methods of guidance to link the learning and teaching UX design processes in ID departments.

Keywords - UX Pedagogy, İndustrial Design, Design Studio, UX Design, Visual Communication

I. INTRODUCTION

User experience (UX) is a growing field that brings together professionals from diverse disciplines, including industrial design (ID).King and Chang(2016) emphasize that although designing for smart technologies and screen-based interactions open new possibilities, knowledge should be built on what has been constructed throughout the industrial design history to make a product good.

The whole UX process requires the engagement of people from various disciplines, such as software developers and product designers. Collaboration and communication between interdisciplinary team members are central to professional UX practice (Chang & Lu, 2021).

On the other hand, industrial designers need to expand their skills in designing digital and data-based interactions (King and Chang, 2016). The UX design process needs to be integrated into ID education to prepare ID students with essential skills for a professional life in this sector. Hence, the curriculum, teaching practices and knowledge construction need to be studied to prepare an efficient methodology.

II. BACKGROUND

The demand for UX designers has been increasing alongside the emergence and growth of the UX field. Although there is not a specific route to becoming a UX designer (Kou & Gray, 2019), ID education shares strong associations with UX since it applies a human-centered approach. However, UX theories, methods, and terminologies need to be taught to prepare students for professional UX practice.

The traditional ID education is heavily based on design studios, where studios function as 'experiential learning by doing' (Oxman, 2001). Studio pedagogy employs a procedure in which knowledge accumulation and skill construction are made by students dealing with real-world design problems, where instructors guide them to find their way of tackling the problems and making critiques (Chen & You, 2010). While experienced designers make use of particular strategies during their design process, novice designers follow a trial and error pattern (Ahmed, Wallace & Blessing, 2003). Hence, to support novice designers to guide them through a close-to-ideal process, adapting a more structured process may be more effective by means of the quality and quantity of the design outputs (Cross, 2001). Since students are not experienced by means of UX design, we adopted a structured process with defined methods and timelines for this project.

The basic cycle of UX design consists of analysing, designing, implementing, and evaluating (Hartson, 2012). Methods applied at each cycle vary depending on the time constraints, type of the product, or budget. Within our project, we aimed to make use of methods that students can easily learn and adapt to their current project.

We conducted a seven-week-long UX / UI design project with fourth-year ID students during their studio course at Atilim University, Ankara. The course has three instructors. As to this project, one consultant proficient in software development and UX regularly critiques students' projects. An internet-mediated tool is employed throughout the process to communicate and collaborate alongside face-to-face meetings in the classroom.

Within the scope of this paper, we only focus on the first five-week-long process, which corresponds to the UX design part. We provided a design brief (Appendix A) at the beginning of the project covering tasks in order, methods to use for each task, expected outputs regarding each method, documentation type for each output, and resources related to each task. The overall process consists of six steps: 1. Situation analysis, 2. Problem definition, 3. User research, 4. Wireframing, 5. Interface design, 6. Prototyping. While students were familiar with the user-centered approaches, the methods they employ differ from project to project, and the majority of them encountered the last three steps for the first time. In

the first step, we expect students to conduct literature research and benchmark analysis, eventually making their way to problem definition. To ease and fasten the problem definition for students, we provide a set of questions that guides them to frame their problem. Then, we expect students to make Personas, a method to create a fictional version of a typical user that represents the core audience (Kopacz, 2022). Following that, students conduct a closed card-sorting workshop with three users who fit their audience. The card-sorting method aims to organize the information based on the user's perspective (Wood & Wood, 2008). Based on their analysis, they created user flow diagrams and wireframes. At that point, they conducted user research by employing the User Journey Map method and advanced their wireframes accordingly. Eventually, they designed user interfaces and made prototypes to finalize their projects. We used an internet-mediatedtool throughout theprocess, alongside face-to-face critiques, to collaborate, communicate and document the findings.

III. RESEARCH DESIGN AND DATA COLLECTION

In order to understand how students experienced the structured UX design process, we conducted a focus group study with the participation of four of the five students who took the course. Using this qualitative method, we aim to gain an in-depth understanding of the applied process in detail, from timing to tasks, what challenges them and what facilitates their design decisions.

One moderator and one assistant researcher collected the data by observing the discussion of participants. During a 90-minute-long session, the researchers recorded the voices, took notes by observing students' behaviors and then transcripted all.

The participants were in fourth grade and adequately experienced in product design projects but did not take any class or given any project covering UX design in school. On the other hand, at the beginning of the discussion, student A declared that she had previously taken active roles in several entrepreneur teams as a UX designer. Students S and E also said they participated in at least one UX project but only in the UI part. Only student M has neither any knowledge nor experience in UX design.

IV. FINDINGS

We present our findings in parallel with the design brief and the order of tasks.

4.1 Structured design brief

All students appreciate the brief that divides the process into weeks and tasks. They believe structuring the UX design process eased their duties and enabled them to experience every step of a digital product design, from research to information architecture and even prototyping.

4.2 Situation analysis and problem definition

Students were familiar with conducting market and literature research to analyse the current situation; therefore, they did not face any challenges during that task. In the next step, in which students define the problem, we provide a ***question set,*** which they found helpful by means of guiding them to define their unique design problems. It was also helpful for time management by directing them to get to work right away.

4.3 User research

After defining the problems, students conducted ***user-centered research*** that was very useful and challenging. Especially less experienced students struggled with *interviews,* asking the right questions and finding useful information to facilitate their design decisions. At this stage, using the internet-mediated tool,which is supposed to enhance the sharing and collaboration, misled students and caused them to waste time. Slower students were impressed by the research done by leading ones and took their interview questions as examples that were not suitable for their subject. One of the students demonstrated her misaction as follows:

"After a week had passed, I realized that I was on the wrong track. Because my app's theme was different from theirs, I realized that I needed to ask unique and focused questions."

The students used the data collected from **in-depth interviews** to *determine their personas*. Some students could not shift from the concept of defining the target market to *determining personas* easily. Defining a persona as a fictionalized description of the prototypical member of one's core audience (Pulizzi, 2013; as cited in Kopacz, 2022) challenged them. Most of them had difficulty reporting the needs and characteristics of their users that go beyond demographic data.



Fig 1. Card-sorting workshop of a student

According to our process, the next task was to decide on the core features of their apps and categorize them together with their users by applying the ***card sorting method*.** They all agree that the card sorting method is

beneficial in discovering the optimal organization of information from potential users' viewpoints (Wood & Wood, 2008).They believe that this method will work well if adopted in the physical product design process to organize and categorize the features. In addition, they expressed their satisfaction with the role-play executed by the teacher in the previous lesson, just before the students had conducted their apps. Later they complained about not having the same study for other tasks, especially for user-flow and customer journey maps.

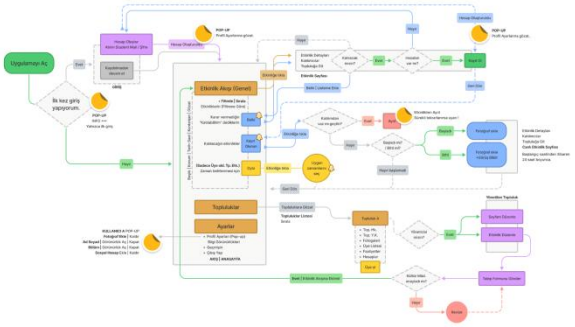


Fig 2. Information flow diagram of a student

The next task, the design of the flow of information, was a new task for them. Although they found it very complicated and diligent, they accepted designing ***information flow diagrams*** as the core of their duty as a designer. Student A expressed her ideas about this task as follows:

"When I prepared the user flow for the UX project, I was able to envision(?) the UX project. I had the construction sketch, and I knew what to build upon."

They approached user flow as a means of communication. They believe that designers are capable of doing this task better than engineers since they follow a human-centered design process. Student A emphasized the importance of user flows as follows:

"I think most people did not get how important this user flow chart is. They try to see the result (UI) directly, but in the end, they always come back to the beginning."

4.4 Wireframing

After completing information flow diagrams, they were asked to design ***wireframes*** for their apps and test them with users. Findings show that students experienced this stage differently from each other. Two of them expressed that they had difficulty designing interfaces with no visual elements and said they preferred to apply user tests after prototyping. The other two argued against this suggestion and declared that they took advantage of *user tests*, learned from users' critiques, and corrected many decisions before putting effort into designing the prototype. Three of the students argued this as follows:

"E: When we showed the wireframes, we had to explain most things. They couldn't interpret most of the interface design.

M: Yes. They didn't understand what was what. They needed to be guided.

A: Isn't it better to hear the users' interpretation? They can give valuable critiques in this way. Otherwise (in the case of showing the completed design, they would have been too oriented, and the tests would only be used for confirmation."

Before designing the prototypes, they were asked to prepare ***user journey maps.***Surprisingly, according to our findings, the most challenging task was this one. They had difficulty shifting from storyboards showing user scenarios to creating maps. They were confused with several different examples that they searched on the Internet. Furthermore, they confessed that they did not understand the purpose and use of the user journey map even after completing the task. The students demanded a workshop/ role-play introducing how to prepare a user journey map before everyone does their own as the teacher did for card-sorting.

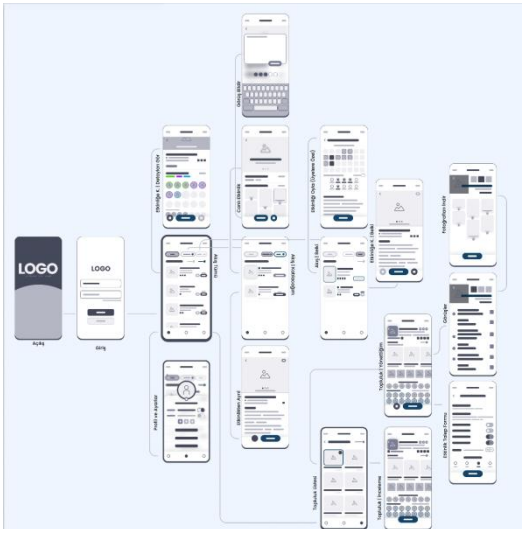


Fig 3. Wireframe draft of a student

The project's final step was to design a ***user interface (UI)*** and ***prototypes***of their apps by using Figma. They all believe that their app designs were assessed based on their UI at the final jury. They expressed their concerns and thought that their UX-related efforts stayed out of sight and concealed while being evaluated by the jury members. They perceived the UI design process as pressure to do an unrelated task, which takes two weeks. One of the students expressed her feelings as follows:

"I was nervous that the entire experience design will be graded on the prototypes that emerged in two weeks."

Overall, from problem definition to prototyping, they are grateful to design at least one UX product and learn about the basics and the terminology. Furthermore, all of them believe that UX has great

potential regarding employment opportunities as a profession. They thought it should be taught starting from the earlier years of education and integrated into other design courses. Student E believed that UX education would provide the required mindset for constructing projects by putting humans at the center:
"This concept of "user experience" should be known from the first grade because our business is causality; We are interested in why we design for people. Everything we do must have a reason, and this reason should arise from the experience of people who justify the need for a new product, physical or digital."
Students were also happy to have an information architect consultant who gave critiques and advice about this heeded task.

V. DISCUSSION AND CONCLUSION

This paper aimed to understand how ID students experience a structured UX project. In line with this aim, we conducted a focus-group interview which gave us unique and valuable results to evaluate the design process we applied and understand the reasons for success and failure. The discussion facilitated the gathering of eligible information about students' opinions regarding the strengths and weaknesses of activities and understanding basis.
Overall, findings show that all students find the structuredness of the process and the variety of applied methods, informative and helpful. They believe that the overall process prepared them for further UX projects that they might participate in their professional life. Furthermore, they find some methods appropriate to adapt their ID projects, such as card-sorting and user flow.
Regarding the content of the project, they think as ID students, they should be heavily responsible for UX design compared to UI design. Their knowledge of design shares commonalities with designing experiences, and they easily relate this knowledge to a digital product design process. In parallel with their concern, we might shorten the UI process, expect them to make prototypes with wireframes and provide a design library without implementing each screen.
One of the problems students faced was the self-learning process of the methods they are not familiar with. Getto and Beecher (2016) offer four components of a UX pedagogy: orientation, observation, practice, and play. They propose that students need to be taught before practising the method for the first time. Then, if it is possible, they need to observe it in a real place. Afterwards, they will be able to adapt it to a simulated or real project which can be eventually followed by playing with the method to adjust it in their way.Our results confirm that students benefit more when we role-play the card-sorting method. Therefore, for future projects, we plan to role-play or provide students a place to observe the application of a method before they get their practices into play.
Although the acquisition level differs for each of them, all students stated that they understood the importance of collecting data from users and making design decisions based on the analysis of this data. They had difficulty in building user journey maps with wireframes; therefore, preparing prototypes with wireframes and then conducting user research to generate a user journey map would be more appropriate within the project timeline.
Regarding the evaluation of the projects, all students attached great importance to the criticism of the jury and their grading. This result-oriented thinking may hinder their assessment of learning outcomes since the anxiety of getting a low grade came to the front in most of their comments.
Lastly, they profited from the consultancy of a professional. This fact aligns with the fact that teaching UX is challenging due to the nature of UX design in which interdisciplinary work and cross-field experience take place (Bačíková, 2015). Hence, in future projects, it is essential to make collaborations with professionals or have a consultant who can regularly give students critiques throughout the project.

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APPENDIX A

Week	Date	Task	Method	Output	Documentation	Resources
1st week	07.02	Situation analysis	-Literature research -Market research	- Analysis of the existing situation - Definition of the design problem	Notes & Miro	https://l24.im/EzS19Q
	10.02	User resesarch	User research	Analysis of the potential audience	Miro	
2nd week	14.02	Defining target audience	Persona	Definition of the audience and finding 3 potential users for next research task	Miro	https://l24.im/bfg
	17.02	User research: Defining features	Card sorting workshop (with 3 users)	- Features and functions - User flow draft	Photography & Notes Miro	https://www.designkit.org/methods/card-sort
3rd week	21.02	Scenario	User flow	User flow diagram draft	Miro	https://medium.com/teamkraken/user-flow-nedir-f6420dc3f25d
	24.02	Scenario	User flow	User flow diagram	Miro	
4th week	28.02	Wireframing	Sketching	Application features & functions	Photography & Miro	https://www.sketchize.com/
	03.03	Wireframing	Figma	User flow diagram with screens	Figma & Miro	https://www.interaction-design.org/literature/topics/wireframing
5th week	07.03	Wireframing	Figma	Application features & functions	Figma & Miro	
	10.03	User research: Testing wireframe	User Journey Map (with 3 users)	User Journey Map	Figma & Miro	https://l24.im/pkNtK
6th week	14.03	UI Design	Wireframe revize	Wireframe & Brand identity	Figma & Miro	(Bkz: Kaynaklar) Figma kütüphanesi
	17.03	UI Design	Figma	Visual elements' design	Figma & Miro	
7th week	21.03	Prototyping	Figma	Interactable prototype	Figma & Miro	https://www.figma.com/prototyping/
	24.03	Jury				

APPENDIX B

Focus Group Interview Questions

(Experience)

- Have you done a UX project before? Where and how have you experienced all this? How defined was the process? How do you think the project ended?

(Brief and process)

- Do you think that the brief limits you? Would you rather use the methods you propose yourself instead? Why? How did the suggested methods to use during the user research phase contribute to your project?
- Which steps do you think should be longer/shorter than the project steps? Why?
- How did you use the resources provided in the Brief?

(Problems)

- At which step did you have the most difficulty in the process? What do you think was the reason for the difficulty? What have you experienced? What would you do now, though?

(Critiques)

- Today, how do you evaluate the process after the project is completed? Do you think the sequence of the mandatory applications and deliveries in the planned process was correct? Have your applications worked efficiently?
- What do you think would lead you to a conclusion that the project process was less structured? What do you recommend? Why?
- As an industrial designer candidate, to what extent has this process prepared you for future UI/UX projects?

(Thanking)

Thank you for participating in this research and answering our questions.

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