Probing Design Researchers: Understanding Ph.D. Student's Routine

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Abstract. This study presents a ludic approach to understand design researchers' routine and its relevance in providing insights about their research. We place design researchers as users to comprehend their daily activities while doing their research. In this project, design researchers consist of students from the Design Ph.D. at the Faculty of Architecture, University of Lisbon. By using design probes, we intend to draw attention to the design researcher's unique experiences and distinctive perspectives while creatively engage the users to collect data. We collect four sets of data from five participants. One of the essential results of the probing activity is that each participant is aware of and reflects on their anxiety and happiness while doing their work. This chapter's work will contribute to a better understanding of student's design research practice as expertise rests on it. Sharing this personal knowledge may help upcoming Ph.D. students in creating and developing guidelines, especially in the starting years of their research and investigation.

Keywords: Design research · design probes · design education · design researcher · postgraduate students

1 Introduction

Design signifies us to be human and a determining element of people's quality of life [1]. It affects all the details of our everyday lives. As Design Ph.D. students, we are intrinsically connected to design research and education. We apply its methodologies daily to improve our knowledge, understand the reality of our problems, and seek new ideas and resolutions. As designers, we focus on knowing how to structure the conversations to inform the best design solutions for our work [2]. While designing, we often face a problem, or in our case, a research problem, which is an issue or concern that needs to be addressed [3]. In this study, we seek to understand not the research methodologies nor how they are instrumental in the design process but how Ph.D. students as design researchers live their day, almost to the hour. Their morning routines, self-rewards, break times, and moods may influence their productivity. The idea is to place design researchers as users to understand the meaning beyond their activities while doing research. It may provide an insight that will grant us access to distinct problems and solutions that fit each individual.

A person is not just made of one character trait; the same thought applies to our craft; Design is a multidisciplinary area, and the more we know about the world surrounding us, the better designers we will be. This multidisciplinary nature of Design is heavily influenced by design education. How it has been taught shapes the direction of the designers coming from schools. Teaching and learning design are complex activities. We need to understand design and its context in a multidisciplinary environment, such as the ecological, social, economic, and political in which design takes place [4]. Design education has evolved into a complex methodology that goes beyond artistic views and purpose guidelines. What was once very aesthetic and functionality-based has come to be understood as a mixed approach. Students should be taught to be empathic and think critically [5] about their surroundings.

According to Woolery [6], empathy is the first and foremost step of any design problem. Any designer needs to be put in the user's metaphorical or actual shoes in order to immerse in the mindset and relate to the problem. The second step is to define the problem at hand: typify the user (as detailed as possible), understand the need, and define the importance and insightfulness of the discoveries made. Followed by the spawn of ideas (ideation), where they are generated, discussed, and suggested methodologies, depending on the approach the designer takes. Woolery [6] points out that the next step, prototyping, allows us to understand, settle conflicts, and evaluate evidence quickly and with minimal consequences. Prototyping leads to the final step, testing real users and getting feedback, understanding what we are initially setting out to do, and finding the best way to do it. Equipping emerging designers with the knowledge and the tools to best address these challenges requires a new way of teaching and learning: one rooted in an understanding of social impact.

To empathize with each student's problems, we decided to use cultural probes, a non-participant approach with a qualitative, exploratory, and ludic nature. Cultural probes were first used by Gaver, Dunne, and Panceti in their 1999 design project that required the input and collaboration of the elderly in several diverse European communities [7]. The idea was to use a method that did not require a formal analysis of the results. Instead, it was processed in a relatively informal way. Cultural probes incite the participant's creativity, usually, in their environment, at their own pace, without any outside manipulation other than the tools and guidance provided. By applying the cultural probes method, we hope to have a clear view of the student's everyday life while doing research. We hope to inspire future designers and researchers to find their own routines, what works for them, what makes them feel motivated, and what drives their research processes.

2 Design Probes

Cultural probes, also known as design probes, are innovative design method that emphasizes the approach of user-centered design. It is based on self-documentation by potential or real users. Design probes are meant to capture the daily experience of a user that will answer empathy, new challenges, research, and development of design, and can also be used for teaching, developing, and evaluating a design [8]. Its main strength is the ability to decode something unconscious by relying on visual and verbal knowledge while looking for subjectivity in the user, emphasizing the notion that everyone is different.

Using simple visual and tangible objects for data collection, Design Probes invites users to document material actively. The probe objects may include various printed materials such as diaries, maps, postcards, diagrams, and other devices such as cameras or voice recorders. These objects are designed for their respective tasks according to the type of information the researcher needs. They undermine ideas about research to encourage informal intimacy and creativity for the participants and produce observable evidence with enough uncertainty for researchers. The best probe task balance is empirical encounters with playfulness.

Research method using design probes in the design education context is emerging [9, 10]. Design probes work best to unfold users with specific traits, such as elderly [11], kids [12], or immigrant youth [13]. Experimenting with design probes provides an insight into what design research is and could be and encourages and nurtures an interesting relationship between researchers and participants. The bridging connection happened when the researcher gave the empty probes as a gift, and the users gave back the filled probes in a generous manner. The types of insights received by the researcher would be diverse, and they sparked various discussions and potential results.

3 Method

This study was divided into three phases, but it is important to note that most of the phases were done online because of the COVID-19 pandemic situation. The first phase was to plan and design the probes; the goal was to understand how design probes work, how they can be organized, how they can be planned, and the actual design process of the probes. The second phase was the probe's formal application; the goal of this second phase was for the probes to make their way into the participant's hands. Thus, they were hand-delivered to our colleagues in Lisbon and the outskirts of Lisbon, in Portugal. The third phase was the data recording and analysis. An excel spreadsheet was created for that effect to sort the data and Cross [14] tabulate the results to find similarities and differences. It is interesting to point out that the only offline activity in the study was when the probes were delivered and picked up. In this study, the design probes recorded six days out of one week of the participant's daily life.

3.1 Designing the Probes

These design probes aim to get intimate data on Ph.D. students' daily life. At the design stage, the idea was to create and develop an online diary, to distribute efficiently to every student in the Ph.D. Design Class of 2020 at the Faculty of Architecture, University of Lisbon. However, no flexible platform could accommodate the drawing option nor suit the needs of the probes we envisioned. Therefore, we used a printed diary probe explicitly designed for this effect. The probe's design process encompassed six goals to gather the participants' daily lives: their routine habits, research habits, methodology, goal/task, approach for research, and schedule. From these goals, 15 questions were drawn to be answered daily by the participants.

The probes are a balance between questions, small tasks, activities, and mood stickers to get the participants to engage in the experiment. From Monday to Saturday, a series of

Fig. 1. Printed diary probes

tasks can be recorded, such as: drawing their desk setting, drawing their lunch and snacks, drawing their workflow, asking about their self-reward, drawing their routine workflow, and graph their weekly research project. The mood stickers contain five emotions ranging from very happy to very sad, which participants can stick on the diary however they like. There are also greetings at the beginning, middle, and end of the diary, so the participants feel appreciated.

The probes have $9,5 \times 7,3$ cm dimensions and are printed in colors. These specific dimensions were chosen since we want the participants to bring the diary in their pockets, especially if they engage in outdoor activities during the week. Figure 1 displays the printed version of the diary probes, which were complemented with a tote bag, a marker, and a notebook, as a thank-you gift for completing the diary. Visser et al. [15] stressed the importance of probe packaging to inspire participants to complete the work and make them feel valued as experts with their own experiences.

3.2 Procedure

The probes were designed using vector-based software to manage and structure the pages of the diary efficiently. We designed the diary as cards to ease navigation; one probe consists of 24 cards. The probes were delivered on Monday, 10th of May 2021, and collected on Wednesday, 19th of May 2021. Since we need to hand-deliver the probes, we choose our participants by their living areas. We identified a total of five colleagues living in the area of Lisbon.

3.3 Returned Data

We only received four diary probes out of five that were sent; one of the students did not returned the probes. We created a spreadsheet to make the display more seamless and analyzed of the results. The spreadsheet can be found at https://bit.um.ac.id/Design Probes. Per the research ethic and data protection, we display the participants' names as participants A through D. Overall, returned diary contains applied mood stickers, scribbling, and doodling from participants.

Fig. 2. Collected probes

4   Findings and Discussion

Design probes are a very helpful tool in becoming a more reflective researcher; not only does it make us think deeper about what constitutes our research, but also about what activities are done on any given day and what might influence those activities. The results gathered after one week of probing were interesting (Fig. 2). After writing them all down, it was great to see some patterns forming and determining the habits of the participants just by their routines.

One of the correlations found was that the mood the participants woke up in reflected the research or the work they did that day. There were several days when the mood was not as positive. It was reflected in how much they accomplished the remaining day. Also, one commonality in all participants is that they all seem to have very similar routines as they wake up: a combination of having breakfast, chatting with family or friends, and going for a walk. Another interesting finding was that all the participants were very visual. For example, the pictures were colorful and detailed in the draw desk setting task. They either draw, scribble and write on post-it notes, paper, or tablets while doing their work. It is possible to see that they are visual thinkers - one commonality in designers and design research.

It is important to mention that these results might be affected by the fact that the end of the semester is approaching, so the workload is higher than at any other time. This condition means that the results are severely influenced by the amount of work the participants have for the Ph.D. course while developing their research.

Another vital piece of information to pinpoint is how the probes made each participant realize and reflect on their types of anxiety and scale of happiness regarding their work. If we as researchers can reflect more deeply on our daily choices, related to work or not, we will be able to see what bodes in our favor or not. If a habit prevents us from doing our research, we can immediately see that habit and change or even erase it from our daily activities. The same applies to the happiness level; if there are certain activities, mementos, or behaviors that make us happier throughout the day and enhance

our abilities to focus and work, that is something we should keep and replicate, over and over.

One of the most positive feedback we got was regarding the daily task of writing something about their research. In fact, Participant B even said that she missed the probes the day after they were done, which can tell us that researchers could have beneficial effects from having some recording of their works and habits.

At some point during the week, all participants agreed that a good night's sleep heavily influences their productivity on a given day. Therefore, while research and work may be extremely important, it is also essential to rest, eat well, and have a good night's sleep, to ensure the day is productive.

There also seems to be a correlation between waking up early and crossing off all the tasks. We clearly understand that it is impossible to generalize with such a small sample. However, the idea is that the earlier we wake up after a rested night, the more tasks and further advances in our work could be made. Another interesting fact gathered was the approach to the research. All four participants mention a sort of priority from where they start. Design researchers should prioritize topics and authors. Thus, all the participants used that "method" to organize their thoughts, themes, and subjects.

Furthermore, there was a two-on-two pattern: for half of the participants, the weekend is synonymous with rest. The other two feel like they are more productive during the weekend. These are exciting results in the sense that, weekly, there seems to be a routine that ends up getting in the way of research and work; during the weekend, there are fewer constraints and more free time. However, we should also see that participant A is the only one who feels productive during the weekend since he is the only one currently doing a Ph.D. while working on the weekday among all participants.

5   Conclusion

This specific study is of an exploratory nature, which means the sample should be bigger, that to pursue further and more accurate results and conclusions, the sample should be bigger. Any study comes with limitations, implications, and a margin for error. In this case, the limitations were quite a few: starting with the COVID-19 pandemic situation, which made the task of thinking and collaborating on the design of probes harder. There was a chance that some participants might not want to be in contact with something created by others—which did not happen in this case. Moreover, most of the work had to be done online without the researchers being able to meet.

Another limitation was the printing and pricing of the process. To print the probes was a choice made on a lack of existing software or application that would perfectly recreate the diary sense of the probes digitally. We believe that as designers and researchers, there is considerable freedom in having a paper where they can write, draw, and scribble, and we did not want to remove that creativity from the probes. As Cross [14] has mentioned that to solve design problems, a design researcher needs to shift their perspective from problem-focused to solution-focused cognitive strategies by utilizing non-verbal modeling media. Nevertheless, the cost of printing such materials was high, and we tried to find alternatives to how much we would spend. Invariably, there was some investment that, in the end, made the most sense.

Our results were deeply influenced by the number of participants we had in the study. As mentioned before, the number of participants was considered a limitation related to the cost of printing. The more participants we had, the more expensive it would become. Moreover, even though there is a need to carry on with this study to understand how researchers do and conduct their research and how their daily habits influence that, four participants were a tiny sample. A fifth participant was unable to complete the task due to an overwhelming amount of work related to the end of the semester. We could have deepened the answers with more time and met proper research value.

In the end, this experiment was genuinely enriching. Not only did we get to meet some of our colleagues in real life, but we also understood a little bit better how their daily habits and routines highly influence their work. It is also important to grasp that keeping a diary or journal during any research process is fundamental to understand our work and what influences it. This research could be enhanced further by asking more profound questions related to their Ph.D. research, such as: 1) what relevant things are related to the research process they have learned; 2) Student's preferences while doing research whether it is working alone or forming a research team with their colleagues. Thus, we may acquire more data regarding their preferences on research methods.

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