Creative Pedagogical Activities for User Evaluation Methods Courses

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In this contribution, we present three teaching activities used during a User Evaluation Methods course (Bachelor level): a self-exploration of methods, scenario-based debates around methodological choices, and a flipped-classroom video assignment. These are hands-on activities, brief and modular, that can be used or adapted to any similar course on user evaluation methods (on-campus or remote teaching). We describe each activity and reflect on their use, supported by students' reflections on the course and insights from our teaching practice.

1 INTRODUCTION

It makes no sense to teach about methods, or interaction design in general, in a theoretical way only. Just as showing a recipe to students in a cooking class won't suffice to make them great chefs, explaining the theoretical principles of user research methodologies won't be enough to make them good user-centered designers. Learning about methods requires critical thinking and practice, at different levels of granularity.

In this contribution, we present several teaching activities used during a User Evaluation Methods course (Bachelor level). These are hands-on activities, usually brief and modular, that can be used or adapted to any similar course on user evaluation methods. We describe each activity and reflect on their use, using our first-person perspective as lecturers as well as students' reflections and evaluations.

2 INSTITUTIONAL CONTEXT AND LEARNING OBJECTIVES

Our User Evaluation Methods course is part of a Bachelor curriculum within a department of Industrial Design. It belongs to the Deepening Level focusing on second and third-years Bachelor students and is open to both Industrial Design Students as well as other educational programs offered at the University. A requirement to participate in the course is to have completed an introductory course about user-centered design process and methods. Students should thus have a basic level of understanding of the main context and methods prior to the course, and might have applied some in their projects. Some students might also take this class, without having completed the introductory module, which can be a challenge in terms of intended learning outcomes and level of the students upon arrival. On average, 50 students are enrolled each semester. The course entails 140h (5 ECTS), composed of 4-6h of lecture time and 8 hours of self-study time during 10 weeks.

In this course, students learn how to prepare and conduct user evaluations of products and services. They discover and experiment with several evaluation methods, from the preliminary stage of recruiting participants, to executing evaluations and analyzing the collected data. The course involves individual study time, lectures including hands-on exercises, reading literature, preparing and executing user tests and analyzing the outcomes of the user tests. The preparation, execution and analysis of the tests involves teamwork. We also use more creative teaching activities, which we report on in the present Teachable Moment contribution.

After completing this course, the student is able to:
1. Describe at least 3 different approaches and techniques for evaluating concepts/products with users.
2. Explain the strengths and the limitations of the different methods in their own words.
3. Define proper evaluation goals for later phases of the design process.
4. Choose and tune an evaluation method that suits the situation, for later phases of the design process.
5. Choose a proper number of participants for a user evaluation.
6. Apply an ethically sound method for recruiting participants.
7. Have practical experience of planning, performing, and reporting at least two evaluation methods
8. Correctly apply proper data analysis techniques, both for qualitative and quantitative data.
9. Draw valid conclusions from a user evaluation, supported by the results of the analysis.

3 CREATIVE TEACHING ACTIVITIES

Through multiple iterations of this methodological course, and building on our experience of teaching methodological classes to a variety of audiences, from HCI/design students to students of other disciplines or practitioners, we developed several teaching activities related to user evaluation methods. We believe that these activities can be interesting for the community of HCI educators, to be applied to their curriculum or to inspire future initiatives.

The methods we described were used both during an on-campus semester and a remote teaching semester. They are thus adapted to different forms of teaching. Each activity can be customized (e.g., by changing the methods or scenarios included) to serve specific pedagogical objectives. Overall, the activities are inspired by Kolb's cycle of experiential learning, starting with a concrete experience, reflecting on the experience and conceptualising what they have learned, to move back to an active experimentation by trying out what they have learned and testing the implications of this abstracted knowledge in new situations. We report on students' reflections about the course: in our design curriculum, students have to provide a 1000 words reflection about

each course or project they take. They are trained to reflect on their learning experiences and there is no prompt in the instructions hinting at the specific teaching activities we present here.

3.1 Self-exploration of Methods Booklet

3.1.1 Format and Pedagogical Objectives

The self-exploration of methods booklet is a hands-on activity, using real user studies. Students learn by adopting a first-person perspective, and putting themselves into the respondents' shoes.

The main goal of this self-exploration activity around user evaluation methods was to broaden the repertory of methods of the students, as the lectures were focused rather on fundamental methods (e.g., interviews, observations, questionnaires) than specific tools. The self-exploration booklet was used as a kick-off activity, able to trigger the interest of students and to showcase how much practical potential the course could have for them. The methods included in the booklet were discussed further during the related lectures (e.g., AttrakDiff during the lecture on evaluation scales). Our self-exploration booklet currently includes 10 methods: self-made questionnaires, product reaction cards [1], AttrakDiff scale [4], User Experience questionnaire [10], Repertory Grid [6], Geneva Emotion Wheel [11,12] , Cognitive Load assessment [3], Interaction Vocabulary [2], UX Curve [9], Sentence Completion [8]. The Sensual Evaluation Instrument [5] is proposal as an optional task (as it requires some material to 'craft' the tool). Each method is briefly explained and a link is provided to a real user evaluation study including this method. The booklet includes questions to guide the critical assessment of the method. The booklet can be customized according to the pedagogical objectives.
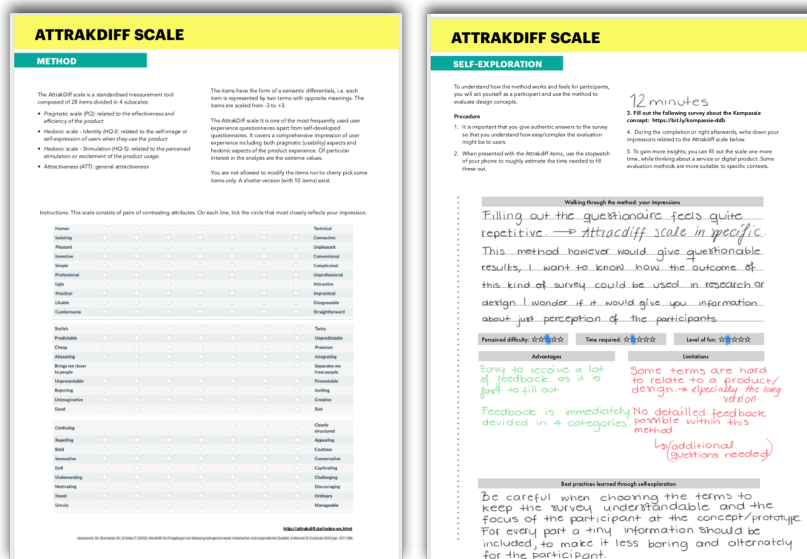

Figure 1: Example of method used in the self-exploration booklet

3.1.2 Description of the Assignment

Adopting a first-person perspective, you will try out several user evaluation methods and tools and reflect on their respective strengths and limitations. While designers often ask users to fill out lengthy questionnaires or

to conduct various user testing tasks, it is an enlightening experience to try the methods out yourself as a participant first. Then, with a critical mindset, you will reflect on their complexity, the time to complete the activity and the cognitive processes involved. We will use real studies - on ongoing research projects - so that you can experiment the methods in a realistic setting. The different methods to explore in this assignment are presented in this booklet. The booklet also include space to take notes and a few guiding questions to support you.

Instructions: To understand how each method works and feels for participants, you will act as a participant and use the method to evaluate design concepts. It is important that you give authentic answers to the survey so that you understand how easy/complex the evaluation might feel for users. The vast majority of the studies used here are real evaluation studies conducted in the department, either by students or researchers. None of them claims to be perfect, and this is why they offer a great support for reflection. For each method:

- Read the explanations and fill out the study giving authentic answers
- During the completion or right afterwards (to keep a realistic idea of the completion time), write down your impressions related to the method, and the way it is included in the overall study.
- Use a stopwatch to roughly estimate the time needed to perform an evaluation using this method.
- To gain more insights, you can fill out each method one more time, by thinking about another context or type of product (for instance a current project you are working on). Some evaluation methods are more suitable to specific contexts and it is thus useful to look at several perspectives.
- Make sure to document your observations, ideally in the booklet. We will use them during discussion time. The questions provided are meant to guide your reflection but are not exhaustive.

3.1.3 Insights from Students Reflections on the Course

In their written reflections about the course, students highlighted several advantages of the self-exploration booklet. We illustrate these reflections using a selection of quotes.

Discovering methods: The first theme mentioned by most of the students was the opportunity to discover many new methods in a rapid, accessible and fun way.

"The first assignment already gave an overview of many tests I had previously never heard of"

"The Self-exploration methods booklet was, in my opinion, the best part of the course. Raptly going through different methods learning real different techniques that could fit different evaluation goals".

"The self-exploration of evolution methods was an accessible way to get to know new methods or to learn in-depth about evaluation methods that I was already familiar with

Understanding the pros/cons: Students could better grasp the advantage and limitations of each method in context, and realised that a method might be suitable for a specific context but completely inadequate in another.

"Undergoing these tests myself provided an interesting perspective on how they work and what their strengths and weaknesses are. I learned what type of test works in which scenario"

"The self-exploration assignment was an interesting and fun way to (quickly) learn about a lot of different methods. It provided a clear overview of the procedure, strengths and limitations, to get an idea of what method suits best in a certain situation".

Empathizing by exchanging perspectives: the exercise encouraged students to empathize with the target users and to become more aware of how the quality of a given protocol influences the quality of replies or the motivation to participate in a study.

"It was really useful as it showed me both the user and the designer aspect of the method. Thus, I know on one hand what kind of data it can generate and in what context it works best as well as knowing the difficulty level for the user to use the method, as well as which ones might be more fun to use."

"Understanding the advantages and limitations of each method helped me by understanding the potential interviewee better. Also, this will help me by choosing the right method in the future".

Ethics: An unexpected outcome of the assignment was that students also discovered how the ethical side of these methods was managed, especially the various ways to collect informed consent from the users.

"This gave me a complete understanding of each method and when to use a particular method along with the structure and ethics of a survey form".

Application and take-away guide for future projects: Finally, students emphasized the opportunity to apply the methods in their current or future design projects.

"I even managed to implement some of the techniques discussed in the self-exploration assignment into my project when testing our product with users. It's also very valuable to know what strengths and weaknesses the methods have, so you know when to use them and when to choose another."

Suggestions for improvement: students also provided suggestions for improvements, mostly expressing their desire to have longer discussion time during the class around those methods in the first few weeks. A second point was a lack of depth due to the broadness and high number of methods included in this assignment.

"The self-exploration of evaluation methods was a fun, effective and interesting way to introduce us to these methods, and the only thing that I missed is the opportunity to further discuss these methods with the lecturers and other students in the first week(s)".

"More than half of the methods covered in the first assignment Self-exploration of methods were new to me. I am very pleased with this new knowledge, which I can use in my future projects. However, I found it a shame that due to the large number of methods I had little time left for a deeper investigation".

3.1.4 Insights from the Instructors' Perspectives

The self-exploration booklet proved to be a successful onboarding assignment in the course. Thanks to its modularity, we also used it in other courses or projects to support students in broadening their methodological toolbox. For both the self-exploration booklet and the video assignment, the choice of methods can vary depending on the objectives of the course. In an industrial design curriculum, the interaction vocabulary or the product reaction cards were good candidates, yet in an HCI curriculum with a stronger orientation towards Graphical User Interfaces (GUI), these could be replaced by methods such as card sorting or A/B testing.

One challenge in designing this assignment is to provide the URLs of real studies using each of the method in the booklet, with a reasonable quality and following ethical practices. Being part of a large department is an asset, as we could use the ongoing studies conducted by professors or PhD candidates. To ensure that these studies are still online at the time the lecture is given, or to avoid the burden of renewing the studies each

quartile, it is possible to duplicate them and store them for later use. One could even imagine setting up a shared repository of ongoing HCI / design user evaluation studies to collect examples from different institutions and set up "playlists" for this activity. While the majority of the studies provided in the booklet were online studies (usually online forms), traditional material was distributed (as a pdf document) for only a few of them, e.g., the Repertory Grid or UX curves. This was beneficial to represent a variety of approaches, a risk being to inadvertently only promote online studies.

3.2 Scenario-Based Challenges and Debates

3.2.1 Format and Pedagogical Objectives

During our course, students had to read several textbooks chapters about fundamental evaluation methods. To put this knowledge into practice, and understand the complexity behind methodological choice (selecting a method being only the first step in a myriad of subsequent choices and trade-offs), we designed scenario-based challenges. Every week during to the class (prior to the wrap-up lecture), all students (in randomly assigned groups of 4, different every week) were challenged to draft a methodological protocol to solve a real-life evaluation challenge. The duration of this task was set to 45 min reflecting on the case as a group, followed by a pitch of 3 min in front of the whole class and a debriefing session with lecturers for about 30 min. The intent was to develop their critical thinking skills and ability to balance specific methodological choices. Our scenarios cover the following fundamental methods: interviews, observations, questionnaires, diary studies, and user testing. Some scenarios also purposely include specific ethical concerns such as special target populations (e.g., children) or sensitive research topics.

DESCRIPTION OF THE CONCEPT

The WorkWalk is a physical outdoor walking route on the campus, aimed at developing the practice of walking meetings. The WorkWalk can be booked for meetings with colleagues, in the same way as a meeting room either by adding a location to a calendar event or directly booking a room in the TU/e booking system.

Designed by Ida Damen, the Workwalk consists of three elements:
(a) A set walking route with a visible physical 1.8 km dotted blue line,
(b) outdoor meeting point signs at the entrance of all faculty buildings and
(c) the WorkWalk is listed as a meeting location in the room booking system.

The duration of a meeting following the WorkWalk line is approximately 25 min but people can do longer meetings. The WorkWalk acts as a research-through-design artefact. An evaluation of the Workwalk is thus not only an evaluation of the concept itself but an in-situ investigation into walking meetings and how design or technology can support this practice.

BACKGROUND INFORMATION

The WorkWalk was introduced to the university employees in a newsletter to all secretaries in May 2018, with a request to forward the message to their teams. Since then, we collect data on who uses the Workwalk via the booking system. Some people do use it, mostly from the ID department, yet regret that it is not more widely used. We also know that some people do walking meetings without booking them so there is missing data.
When asked informally about their walking meetings practices, people say they frequently derive from the official dotted route but have a hard time remembering when they walked or which paths they tend to use.

YOUR USER EVALUATION MISSION

Walking meetings offer a promising solution to the issue of sedentary behavior. To inform future development of technologies supporting this practice, in-depth qualitative insights into people's experiences of walking meetings are needed.

How can you set up an interview study to evaluate the Workwalk concept and gain insights into walking meetings practices? How to make sure people remember sharp details about their experiences?

SAMPLING

Which participants will you target?
How many participants will you recruit?
How will you recruit them?

METHODOLOGY

What type of interview would you use? Why?
How would you conduct the interviews? (procedure, duration, location, time)
Which topics will you cover? (with examples of interview questions)
Could you combine the interview with another method/tool?

ALTERNATIVES

What alternative method(s) can you think of?
What are their strengths and limitations?

Figure 2: Examples of scenario-based challenge, related to the interviewing method

3.2.2 Description of the Assignment

Each assignment had a customized description of the challenge followed by a set of guiding questions, around 3 main themes:

- Sampling: Which participants will you target? How many participants? How will you recruit them?
- Procedure: What type of interview would you use? Why? How would you conduct the interviews (procedure, duration, location, time)? Which topics will you cover? (with examples of interview questions). Could you combine the interview with another method or tool?
- Alternatives: What alternative method(s) can you think of? What are their strengths and limitations?

3.2.3 Insights from Students Reflections on the Course

In their written reflections about the course, students did mention the learning experience and outcomes derived from the scenario-based assignment. The majority of comments were related to the fact of applying the learnings from the textbooks to real cases immediately, which facilitated comprehension and supported a smooth integration of the reading material (self-study time) in the lecture and exchanges with fellow students.

"It helped me to have offline synchronous activities. This way, reading the acquired material was a real part of the course. Due to a hectic time, this helped me to stay on track and actively participate in the small group discussions during the lectures".

"The use cases were a good way to apply the different methods in context"

"Use cases were challenging because you had to apply the methods instead of using theoretical knowledge"

"Applying knowledge learned from the self-exploration and the reading material during the case studies was very valuable. It was a good exercise to envision a situation and think of techniques to evaluate".

Other benefits included the link between the information that designers need to collect for the project and the way to design a methodological protocol to gather this information.

"The discussion groups have been very helpful as you were forced to apply the method on the spot. They stimulated critical thinking, as I evaluated how to optimize the method to get the information that I'd want"

"user test cases during the lectures were very important for my understanding of the amount of participants needed and how to focus on. It helped me see the connection between the desired information from the user and choosing between different methods".

3.2.4 Insights from the Instructors' Perspectives

For this assignment, we used real case studies from our own projects, rather than textbooks or imaginary cases. Of course, these could also have been suitable and effective, yet the idea for us as lecturers was to be able to talk in-depth during the debriefing session about the choices that were made and the rationale behind these decisions, as well as the surprising insights emerging from using a specific protocol. Students could also relate to the cases as the products/services studied were similar to the ones they design in their curriculum.

One challenge in the creation of these scenarios is to give enough information for the students to make informed choices, yet not too many in order to leave openness in these choices and not steer them by hinting at a specific direction to follow. The scenarios also had to be brief, to be addressed in 45 min. The duration of the task was rather short on purpose, and it was set as a group exercise to push students to argument their choices and to realize, through the discussions with their teammates, how numerous the possibilities are for a single case. The discussions were lively, and the guiding questions helped students to understand the scope of the intended outcome. The pitches were short on purpose, yet very valuable for students to see all alternative choices made by the other groups. As lecturers, we wrote down the main similarities and differences, as well as the most original ideas, and used them as triggers for the discussion. We then shared our own experiences.

3.3 Flipped Classroom 5-min Videos

In a flipped classroom approach, students are actively involved in knowledge acquisition and construction. For this activity, we adopted a flipped classroom approach, where duos of students created short 5-minutes presentations or synthesis videos of specific methods. The objective was that student would learn about specific methods by "teaching" them. It involved a level of depth and engagement with the material that is usually higher than simply reading textbooks or attending lectures. By synthesizing scientific papers about methods under the form of 5-min pedagogical videos, students discovered how methods are iteratively developed and validated. The activity supported them in understanding the scientific foundations behind method development.

In total, 23 methods were selected for this assignment (one per duo of students) and students were randomly allocated to a method. This number can be adjusted depending on the size of the class or the group size.

USER EVALUATION METHODS

1. Repertory grid interview
2. Laddering interview
3. UX Curves retrospective interviews
4. Diary studies
5. Experience Sampling
6. Standardised UX scales: User Experience Questionnaire (UEQ)
7. Usability Scales with a focus on SUS and UMUX / UMUX Lite
8. UX evaluation with kids: This or That method and the Fun Toolkit
9. Technology acceptance scales: TAM and UTAUT
10. Standardized scales for Voice Interaction Design (MOS-X, SASSI, SUISQ)
11. The sentence completion method
12. Product reaction cards
13. Geneva Emotion Wheel
14. RITE (Rapid Iterative Testing and Evaluation) user testing method
15. Think-aloud techniques
16. AXE anticipated experiences
17. The Sensual Evaluation Instrument
18. Auto-ethnography / First-person perspective
19. The interaction vocabulary
20. Playful probing
21. Design fiction probes
22. Speed dating technique
23. Experience narratives (experience reports)

Figure 3: Flipped-classroom assignment topics

3.3.1 Description of the Assignment

For you to be actively involved in knowledge acquisition and construction, we will adopt a flipped-classroom process to discover methods. Each group will be assigned a method to study (homework) and present under the form of a short video. The main references/sources to use for each topic will be provided. You can use additional sources (especially case studies and examples), but you should make sure to check their credibility beforehand. All material used in the video (including visual material) should be properly referenced. Instructions

- This is a short video: between 3 and 5 minutes. You can use (a mix of) traditional slides and voice-over, video shots, or storyboards.
- Include an (easy) definition of the method at the beginning as well as information on: How to use the method? When in the design process? What are the pros/cons?
- Include a brief case study (usually from the paper you will read yet it can also be from other sources or projects) where the use of the method is illustrated using a concrete example
- Make it an experience: if possible, let the attendees try out (part of) the method or involve them in some ways, for instance by asking questions. Be creative!
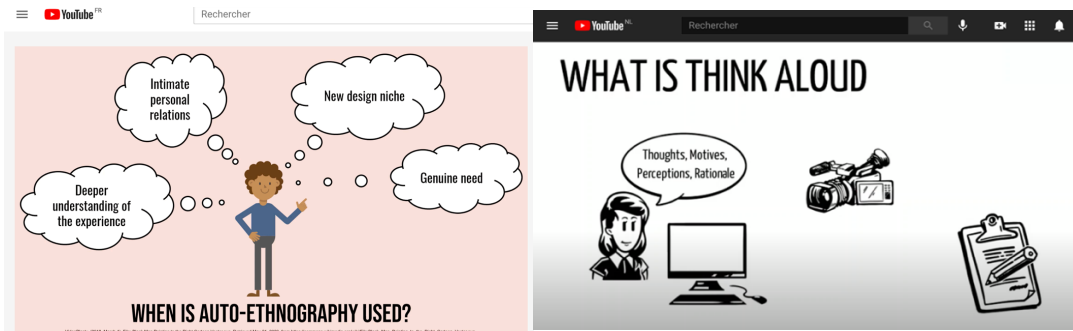
Figure 4: Examples of videos produced by students during the flipped-classroom assignment

3.3.2 Insights from Students Reflections on the Course

In their written reflections about the course, students did highlight several advantages and challenges related to the flipped classroom videos. The main advantage mentioned is the level of depth in the knowledge gained about a specific method.

"Creating the video made me learn more in-depth about the technique. I must say, it was quite a challenge to fit all the required elements in the short duration of the video. However, I do believe that this was a great challenge to strip the technique to its core and truly understand the technique."

"I learnt through this assignment by researching and explaining it to others with my group. I was not familiar with autobiographical design so I started with having no idea about this design method. Now, I will have this printed in my mind. I actually learnt from this experience how useful and effective it is to learn by explaining it to others. This is also something I will keep in mind".

"Exploring a single method in-depth and having to think about how to present this to the class allowed me to process the information better, as I had to think of how to make it understandable and digestable".

Students also appreciated crafting the video (although this was a challenging task) and learning from others.

"I found the flipped classroom assignment to be a fun and engaging way to learn about different methods. Although the method that my group was assigned to was a bit vague, it was very interesting to delve into it and try to find a way to explain it to others. I think this is a good way of learning. Also, seeing the videos of other groups was very educational, since you knew they must also have had a lot of time invested in educating themselves on the matter and trying to present it in the most effective way possible".

"Creating a video about one of the topics was a fun way to gain a deeper understanding of one of the evaluation methods. (…) Besides that, it was a bit of a challenge to sort all information learned from the literature in a short and catchy video. It was also useful to learn from the videos of other groups!"

The main drawback mentioned was the fact of being assigned to a method, which was not always the most attractive one to the students or not immediately useful:

"we are assigned to create an informative video for a larger audience. We faced several difficulties including wanting to put too much information in too little video time, limited video editing skills and a small lack of interest into the assigned method."

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"The flipped classroom video made me go in depth on one method. At first it felt like a waste of time, since I spent a lot of time on one method, that I was not sure yet I was going to use. I ended up not using that method in the course. In the end I see it as a more useful thing, because I now know a lot about it."

3.3.3 Insights from the Instructors' Perspectives

In a first iteration of the course, the deliverable for this assignment was not a video but a presentation. At the start of each lecture, two groups of students were thus presenting methods to the rest of the class, with the challenge to be interactive and engaging. It worked pretty well and students came up with creative ways to demonstrate a method (e.g., the group assigned to the Sensual Evaluation Instrument used clay to reproduced the objects, and the group assigned to product reaction cards brought 25 pens to be assessed by their classmates). The level of depth in their understanding of the method seemed however slightly less good than the one achieved through the videos (which could also be explained by the fact that the videos were a graded assignment, while the presentations did not officially count towards the final grade for the course).

Another benefit of the videos is the opportunity to share them online beyond the classroom or to use them in subsequent iterations of the course. The quality of the outcomes differs: a handful of them is not good enough to be shared, the majority summarizes the content greatly but not always in an engaging fashion, 20% roughly are an engaging professional pedagogical material. One should not underestimate the time needed to create a video, and it is wise to support the students by pointing at online resources such as presentation video template.

The allocation of students to a method in this assignment was done randomly, mostly due to the size of the class and efficiency reasons. One could also base this allocation on students' preferences for a method, which is interesting especially if students conduct other projects for which some methods are more relevant than others. However, one of the strengths of a random allocation is also that students might develop an interest for methods that do not look attractive to them at first sight. This was reflected in the student feedback.

Finally, in the last iteration of the class, we also provided relevant literature describing the methods. A former attempt requiring students to find themselves the scientific papers to use for each method was less successful. Some students did use blog material or less relevant papers only mentioning the method.

4 CONCLUSION

In this contribution, we presented three educational activities that can be used by HCI educators in the context of user evaluation methods classes. The pedagogical activities presented are the results of several iterations. Aligned with the philosophy of 'practicing what we preach', we experiment new teaching formats and adopt a researcher's attitude on our own practice by continuously collecting empirical evidence on how teaching activities influence several aspects of the learning experience. We usually design our lectures as a subtle mix between explanations and hands-on activities representing learning by doing. To make sure these activities are as concrete and realistic as possible, they are applied to real-world use cases. Students learn about different techniques (for instance interviewing techniques) in a progressive way, first practicing specific focused skills in class (e.g., planning an interview protocol or practising follow-up responses in a semi-structured interview) before going to the field. We also try to raise interest in methods by showcasing the potential and benefits of methodological skills, relating them to previous knowledge and current challenges the students are facing.

ACKNOWLEDGMENTS

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