

APPLYING EXPERIENCE REPORTS IN DESIGN EDUCATION: CHALLENGES AND IDEAS

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ABSTRACT

What if both design students and design tutors could have real-time insights into how students actually experience their design process rather than after-the-fact reflections? And what if these insights could be applied in ways that would contribute to more in-depth learning experiences? This paper addresses these questions in describing the initial steps in the development of an application that captures a student's experience of a design process over time, by means of self-reporting. The application makes use of the method of experience sampling (ESM), which is frequently applied in psychological research to collect experiential data in natural settings and over a long period of time in order to understand people's behaviour. The paper discusses the challenges of implementing ESM into an educational design context and presents possible ideas to overcome these challenges.

Keywords: Design process, experience sampling, experience reports

1 INTRODUCTION

It is a situation familiar to anyone who is actively involved in design education: a design student, who is working on a design project, comes to a meeting empty-handed, stating to her design tutor that she is "stuck". She feels that she has not made sufficient progress in her design process, resulting in no production of any sorts since the last meeting. More importantly, she feels unable to get things going again, neither forward nor backward. Through her choice of words, expressions and body language, she clearly communicates a loss of motivation and a need for help.

The design tutor, in turn, is rather surprised. Up to this moment she did not have the impression that the student was experiencing her project as a struggle. Although she was somewhat quiet during the previous meeting two weeks ago, the quality of her project and her enthusiasm and contributions so far did not suggest that she would break down. While the tutor feels that the student is accountable for managing her own design process, she also considers it her responsibility to take care of the student's overall experience of the project. However, most of that experience is happening outside of her range. What if she could somehow get more insight into how students experience their design process? And would such insights not also be very beneficial to the students themselves?

This paper reports on the initial steps in the development of an application that captures a student's experience of a design process over time, by encouraging her to self-report. The application makes use of the method of experience sampling (ESM), which is frequently applied in psychological research to collect experiential data in natural settings and over a long period of time in order to understand people's behaviour. In ESM participants are asked at certain intervals to report their activities, feelings and experiences. The main challenge of the method is to maximize the quantity and quality of these samples minimizing the load perceived by self-reporting on a frequent basis, and at the same time minimizing the burden on participants as frequent prompts could be considered highly demanding and interruptive.

The paper first addresses the context, objectives and considerations for applying ESM in design education: what is ESM, what could it bring to an educational process for both students and tutors, and what are the main challenges when implementing it into this specific situation? This is followed by a description of the work-in-progress on the design and development of an educational ESM application, which is using Twitter as its sampling platform.

2 EDUCATIONAL CONTEXT

In design education the most common context in which learning takes place, is the design studio. In this setting a design student, individually or in a team with other students, works on a design project under the supervision of a design tutor. To monitor how a student is doing, regular meetings commonly referred to as 'design crits', are being held, in which a student presents her work, which is reflected upon by the tutor and/or other students [1]. In these design crits the most noticeable measure of progress is the production of visual representations of the design at hand in the form of sketches, models, storyboards etc. Besides this tangible output, there is also the design discourse, which involves argumentation, questioning and reflection.

While design crits are important learning moments in any educational design project, because of their momentary and staged nature they are not necessarily representative for the actual design process a student is undergoing. With most design activities, such as researching, sketching, prototyping etc., being done within the private context of the student's home or personal workplace, the bulk of the process is happening outside the scope of the design crits and, hence, the design tutor.

As a consequence, whenever a student runs into problems, loses motivation or finds herself stuck in the process, in most cases this only comes to the surface in the next design crit, which could be weeks later. While there are educational tools available to the tutor to probe how students *have* experienced a project, such as course evaluations, self-reflections or competence monitors [2], these are almost always one-time samples taken at the end of the project. To determine how students *are* experiencing a project while it is actually running, the tutor thus has to rely on her own impressions, collected through observations and conversations, and filtered and assessed based on previous experiences. If she would be able to get unfiltered, more frequent, real-time insights into a student's design experience and, subsequently, could react to these insights proactively, this could possibly improve the educational process. Moreover, getting a more longitudinal, reflective and in-depth insight into one's own design process, its activities and its experience, would most likely contribute to the learning process of the student as well.

3 EXPERIENCE SAMPLING METHOD

The need to be able to record real-life experiences while in the moment rather than after the fact, has lead within the domain of psychology to the development of the Experience Sampling method (ESM) [3]. ESM is designed to capture a individual's representation of experience 1) as it occurs, 2) over time and 3) within the context of everyday life [4]. It collects data by having participants complete self-reports, either at designated time intervals, when specific events occur, or when prompted at random moments. These self-reports can have various ESM forms, such as written diaries, short questionnaires or rating scales, which can made available to the participant either in physical form, using paper booklets, or in digital form through websites or mobile applications. The kind of data that is collected can be fully adapted to the specific needs of the researcher, but usually involves contextual facts, such as location, time and activity; social facts, such as setting and other people involved; and emotional facts, such as feelings, thoughts or impressions.

As pointed by Scollon et al. [5], ESM strength lies on the ability to provide fine-grained, and detail picture of human experience. In particular it addresses the dynamic and subjective nature of experiences in daily life practices. It offers the possibility to investigate for contingencies by finding interactions between persons and situations; ecological validity by conducting studies in real-life settings; minimizing memory bias by sampling on-line rather than global or retrospective reports; and within-person investigations by detecting individual differences that emerge over time or across situations, regarding factors like variability and intensity of behaviours and feelings.

However, Scollon also highlighted that ESM weaknesses might bring issues regarding participants, situations, measurement and data analysis. For example, motivation and technology literacy might limit the study to only certain groups; interruptability might limit the scope in which a situation is studied as not all situations afford individuals to answer a prompt within a reasonable time frame; reactivity is a potential threat as frequent prompts might alter individuals' attention and reflection regarding their internal states and own behaviours; large data sets is by its own a challenge even more as sampling does not guarantee a systematic set of data points within and between individuals.

ESM has been primarily used as a research methodology. Recent developments in the area of Personal Informatics [6], and Persuasive Technologies [7], though, have taken ESM principles to implement self-awareness and self-reflections tools for people to track aspects about themselves, e.g. physical

activity, sleep partners, calorie consumption, etc. and to obtain overviews on their behaviours. However little has been done to combine behavioural with experiential reports to better understand not only what people do and what choices to they make, but why they do what they do and why they do they make such choices.

Within the educational domain a number of ESM studies have been conducted, mostly involving children or adolescents with the objective to gather insights into their classroom experiences [8]. As a consequence, the actual sampling in these studies was conducted within the controlled boundaries of a classroom, having the participants fill in the ESM form while in class. Extending the sampling to outside of the classroom, poses some additional challenges, such as how to keep student motivated to report, which our design of the ESM needs to address.

Another difference with our situation is that the collected data in these previous studies was considered as an end, to validate certain hypothesis or identify specific effects, rather than a means which could be directly fed into the educational context that was being sampled. Such a direct application of ESM data does bring up some sensitive issues, though. One of them concerns the relationship of the samples to the tutor. Are students willing to share their personal experiences with the person who will also be assessing the quality of their work? And if so, will their answers not be biased in the direction of social desirability? Another important matter to consider is that the act of self-reporting will to some extent interfere with the experience that is being sampled. Will this have a positive effect, making students learn from becoming aware of their own design behaviour, or a negative effect, interrupting the creative flow of the process?

4 DESIGNING THE ESM STUDY

To be able to get some first insights into these issues, it was decided to start with a small-scale exploratory study. Designing an experience sampling study involves addressing several methodological, technological and design aspects [9], the first of which concerns deciding on the actual **sampling data**. The main objective of this data is that it should provide both students and tutors insights into the students' real-time experience of a design project: what are they doing, thinking and feeling when designing. A distinction can be made between the external dimensions of the experience, which involves contextual factors such as date, time, place as well as activities, and the internal dimensions, which relate to thoughts, emotions or feelings.

The main objective that the data should, eventually, be instrumental to both the learning process of the student and the educational process of the tutor, made us select the Experiential Learning Model of Kolb [10] get insights into the **external dimensions**: what students *do* in their design process. This cyclic model, which is based on the notion that learning is done through reflection on doing, distinguishes four phases, namely concrete experience (CE), reflective observation (RO), abstract conceptualization (AC) and active experimentation (AE). According to the theory, a student should go through all four phases consciously, starting with concrete experience and ending with abstract experimentation. In practice, however, individuals will have a preference for one or two particular phases, leading to four distinct learning styles: converger, diverger, assimilator, and accommodator. Since a design project can be considered as a typical example of a 'reflection-on-doing' context, in which all four phases of the model should ideally be assessed, it would be beneficial to know the phase the student is currently in. Additional attention was given to the sampling of the actual design activities. Because an important part of designing is to externalize ideas using various techniques such as sketching, storyboarding or modelling, it was considered important to provide the possibility to include visual representations of the results of these activities by means of a photo or video in the experience report.

Regarding the **internal dimensions**, which would give as insight into how students *feel* about their design process, it was decided to start with sampling moods rather than emotions. Moods are more stable and less intense than emotions, which tend to be more triggered by a particular event. Since we are primarily interested in capturing a long-term experience, moods would provide us thus with more accurate indications. Moreover, because of their relative steadiness, an actual change in mood could be a better signal of a possible change in the overall experience than a high-impact, but short-lived emotion. To have the students report on their mood in an unambiguous way, we based the sampling on the Pick-A-Mood (PAM) instrument, which was previously developed by one of the authors [11]. PAM uses a set of nine different moods (four positive, four negative and one neutral), which are complemented with a pictorial representation of a female character expressing each mood.

A second aspect concerns the **sampling protocol**. The fact that students would be doing other projects and courses as well as many other, non-educational activities during the sampling period, basically restricts the scheduling of the samples to *event-contingent sampling*. In this type of sampling participants are instructed to complete a self-report directly after a relevant event has happened. This in contrast to interval-contingent sampling or signal-contingent sampling, in which samples are taken, respectively, following a fixed schedule or at random times. It is important, though, that the criteria for the events are appropriately defined and clearly understood by the participants, to ensure that the right samples are being collected. Furthermore, since with this type of protocol the responsibility for reporting would lie solely with the students, it was decided to also probe them with some additional reminders, to increase engagement and stimulate frequent reporting. In the long run, however, a balance between the richness of the reports and the burden for the participant should be established.

A final issue involved deciding on the **sampling platform**. Because one of the objectives of the ESM tool was to provide both students and tutors direct access to the data, paper-and-pencil reports could not be applied. Another restriction came from the fact that the design activities that should be sampled are not necessarily taking place at a fixed location, thus requiring the use of a mobile platform. Additional considerations such as availability, affordability, applicability and usability made us select Twitter as our platform. Twitter, the world's biggest microblogging platform, has been developed to give people the opportunity to answer one simple question: "what are you doing?" in short text messages of max. 140 characters, and to share their answers with other people. Despite or because of its simplicity, Twitter has become immensely popular for sharing the little and personal things of everyday life, having more than 500 million users by June 2012. As a consequence, many additional tools have been developed to manage, analyze and enhance the Twitter experience [12].

Twitter in education has been primarily used to increase engagement in the classroom setting. Retelny et al. [13] show how Twitter can be used to include questions and reflections of students in the lecture slides, that they were asked to tweet the day before. In another study Szapkiw and Szapkiw [14] describe three engagement strategies for in and out the classroom: quiz and polling (e.g. quick assessment of knowledge, interest, opinions, etc.), class and group work discussions (e.g. arguments, clarifications, material, etc.), and creative group work (e.g. posting research findings, design decisions, etc.). Although these works provides interesting insights of the power of Twitter to increase engagement, to the best of our knowledge no research has been done in using Twitter as a self-reporting and self-reflection tool to feed tutor – student supervision meetings. Using Twitter to report own progress and experience in between the supervision meetings may increase the engagement of students in their meetings, empowering their participation from a passive to an active role. The simplicity (and familiarity) of Twitter should be an added value in asking them to self-report their progress and experience.

5 DEVELOPING THE ESM APPLICATION

Our choice for Twitter as an ESM platform implied that we had to extend its main question to "what are you doing and how are you feeling about this?". The setting includes a protocol that invites students to tweet their progress and experiences around the activities related to their design project. The invitation consists of suggestions regarding what and when to tweet, as well as instructing them to use hashtags. Hashtags are an extension to the simplicity of twitter to help organize tweets and to facilitate online analytics. They are keywords marked with a '#' that are used to categorize messages which facilitates searching for specific topics, increasing engagement and the interactivity of the tool.

To guide students on what to tweet a list of predefined hashtags will be available, inspiring students to post about their experiences in relation to 1) activities (e.g. #exploring, #designing, #reflecting) and 2) progress (e.g. #planning, #achieving, #postponing). Both activities and progress could be further characterized by a mood, using PAM to define 8 mood hashtags: (#excited, #happy, #relax, #calm, #angry, #anxious, #bored, and #sad). Thus, a post should be characterized with one or more activities/progress hashtag and at least one mood hashtag. Students are also invited to create new tags when needed. To guide students on when to tweet, two strategies will be used: 1) prompts to trigger them to quickly tweet on a certain experience and 2) assignments to reflect on their day activities. Prompts and assignments will be scheduled one per day alternating one day a prompt, and one day an assignment. Prompts will be scheduled at a random time in the day, while assignments will be at the beginning or at the end of the day.

The initial prompts could be: ‘what’s your mood of today’ (using PAM pictures as options); ‘what’s your main activity of today?’ or ‘how’s your progress so far?’. Daily assignments will be posted as an instructive tweet at the beginning or at the end of the day. For the beginning of the day the assignments could be: ‘what activities have you planned for today?’; ‘what’s your expectations of today; or ‘what you think will be the high and the low of the day?’. For the end of the day: ‘what activities have you done today?’; ‘what was the high and the low of today?’ or ‘what’s the learning point of today?’. Table 1 gives an overview of possible tags and messages.

Table 1. Initial hashtags to inspire students’ tweets; Initial prompts and strategies to engage students

Hashtags [for students]	Prompts and Strategies [for tutors]
Activities #exploring - #designing - #reflecting	Engaging prompts ‘what’s your mood of today?’ (using PAM pictures as options) ‘what activities have you planned for today?’ ‘how’s your progress so far?’
Progress #plans - #achievements - #delays	Engagement strategies – preparing ‘what activities have you planned for today?’ ‘what are the expectations for today?’
Mood #excited - #happy - #relaxed - #calm #angry - #anxious - #bored - #sad	Engagement strategies – reflecting ‘what’s the learning point of today?’ ‘what was the high and the low of today?’
Others #high - #low - #learningPoint	

To administrate the prompts, PollEverywhere [15] will be used. PollEverywhere is a tool that allows sending quiz and polls as tweets, using text and images. GroupTweet [16] will be used to administrate the tweets. Students will be able to create an account in GroupTweet and send tweets from GroupTweet dashboard, or send tweets from their personal tweet accounts to the group. Students can send messages to the group or directly to the tutor (private messages). Likewise, tutors can send messages to the group (all students) or directly to one student. Overtime, and depending on student posts, tutors could post topics for discussion or general tips in relation to most popular posts. For example, PollEverywhere could be used to tweet back the results of the polls to increase engagement.

6 CONCLUSION

Currently we are in the process of finalizing the set-up of the platform and recruiting participants for a first ESM study, which should provide us with insights into the feasibility of the method as well as the usability of the platform. We realize that the challenges we have put forward in this paper are ambitious. The study setup requires the design of small formal and informal evaluations that will be planned at some meetings to assess students’ perception of the value of the tweets in their design project and the quality and effectiveness of the meetings. In particular we will investigate whether the components of the sampling protocol and platform become (or not) an integral part of a student’s design process rather than an artificial construct, which interferes with their natural behaviour. Furthermore, analyzing and presenting the acquired sampling data in ways that are instrumental to the educational process, addressing its impact in the meetings discussions and the reflective process of students will be an equally important and demanding step, which we have not yet fully addressed in this paper. We are convinced, however, that getting access to real-time experiences instead of after-the-fact descriptions and rationalizations, will provide both students and tutors with new and valuable insights into the complex processes of learning and designing.

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