# Design feedback from users through an online social platform: Benefits and limitations


## Abstract

Online social platforms, such as blogs, discussion forums, and social networking sites, are increasingly explored as venues for user-centred evaluations; in particular, for design feedback from users. We present a multi-case study providing needed knowledge on such evaluations. Our findings are based on analyses of the design feedback and post-factum data collections with development team representatives and users. The development team representatives reported as key benefits that the evaluations provided insight into users' needs and competencies, input into ongoing design discussions, and support for idea generation in the development team, but found the lack of direct contact and control with the users to be an important limitation. The users appreciated the opportunity to contribute to the design process, but the majority reported not to build on each other's contributions. Involving a relatively large number of users was found to be beneficial for generating constructive design suggestions. Practical implications and future research challenges are suggested.


## Research highlights

- We studied design feedback from users through an online social platform.
- Development teams saw the approach as particularly beneficial for early-phase feedback from users.
- Users appreciated the approach as an opportunity to contribute needed insight to the design process.
- Involving a larger number of users was beneficial for generating constructive design suggestions.
- Users did not fully utilize the opportunity to build on each other's contributions.
- Strengthening the interaction between participating users is an important future research challenge.


## Key words

Human-Computer Interaction (HCI), HCI design and evaluation methods, user-centred design, design feedback, user involvement, case studies

# 1. Introduction

Evaluating designs with users is important in user-centred design (ISO, 2010). A key purpose of such evaluations is to gather *design feedback*, that is, data on users' reflections on a given design. Design feedback from users may concern experiential aspects of the design (Kujala, Roto, Väänänen-Vainio-Mattila, Karapanos, & Sinnelä, 2011), potential problems in the design (Hertzum, 1999), and suggestions as to how the design could be changed or improved (Cowley & Radford-Davenport, 2011; Cunliffe, Kritou, & Tudhope, 2001). Hence, design feedback from users may serve as a valuable complement to the observational data gathered in traditional usability tests, as it may provide rich insight both into how the design is perceived by its intended users and into possible new directions to be explored in the design process.

Traditionally, design feedback from users has been gathered through face-to-face methods such as workshops (Hertzum, 1999), interviews (Donker & Markopoulos, 2002; Yeo, 2001), and focus groups (Cowley & Radford-Davenport, 2011). Though methods requiring face-to-face interaction between users and the development team clearly have their merit in user-centred design, they may be costly or impractical; in particular when designing for users that are geographically distributed (Yndigegn, 2010). This limits the practical use of methods requiring face-to-face interaction, especially in the early phases of the design process, resulting in an undesirable lack of design feedback from users (Kujala, 2003; Yndigegn, 2010).

Due to the limitations in traditional methods for design feedback, researchers have begun exploring online social platforms as venues for evaluating designs with users (Følstad, Hornbæk, & Ulleberg, 2013; Friedrich, 2013). By *online social platforms*, we mean internet facilities for asynchronous exchange in groups, such as blogs, discussion forums, and social networking sites. As users have become increasingly accustomed to using online social platforms as part of their everyday online lives, such platforms arguably have matured into feasible venues for user involvement.

Utilising online social platforms for evaluation purposes has been seen as a promising approach to overcoming the limitations of traditional face-to-face methods for design feedback, as these platforms allow rapid and flexible gathering of data from geographically distributed users (Følstad et al., 2013). Even so, our knowledge on the benefits and limitations of users' design feedback gathered through online social platforms still is severely limited. This lack in knowledge is critical, as it may hamper the practical utilisation of online social platforms in user-centred design.

This study contributes needed knowledge on the benefits and limitations of users' design feedback gathered through online social platforms. We report on four cases where such a platform was used to gather design feedback from users on designs for new information and communication technology (ICT) services. The study conclusions are grounded in a broader empirical basis than what is found in previous research, including content analysis of the gathered design feedback, interview data on development team representatives' experiences, and questionnaire and interview data on users' experiences from their participation.

The remainder of the paper is structured as follows. First we present the study background and detail the study research questions and method. We then present the study results structured according to the three types of data included in the study, before discussing these in a dedicated discussion section. On the basis of the study findings, we present key implications for the practical use of online social platforms for gathering users' design feedback and point out needed future research.

## 2. Background

Several researchers have discussed potential benefits in utilising online social platforms for evaluations with users. Evaluations conducted through online social platforms may enable beneficial interaction between the users and the researcher, as users may see and respond to researcher follow-up comments (Hagen & Robertson, 2010; Vanattenhoven & Jans, 2007), and also within the group of users, as users may see and build on each other's contributions (Vanattenhoven & Jans, 2007). Evaluations conducted through online social platforms allow for a larger and more geographically dispersed sample of users than what is practically possible in face-to-face methods (Friedrich, 2013), something that is exploited, for example, in beta testing (Johnson & Hyysalo, 2012; Millen, 1999). Finally, the asynchronous characteristic of online social platforms may allow the users more time to reflect on their feedback as compared to face-to-face settings (Reyes & Finken, 2012); hence, making for a pleasant and relaxed evaluation experience from the perspective of the user (Hagen & Robertson, 2010). Previous studies have also investigated the use of online social platforms for other user-centred design activities, such as user research (Johnson & Hyysalo, 2012), idea generation (Bailey & Horvitz, 2010), and co-design (Karppinen, Koskela, Magnusson, & Nore, 2011; Reyes & Finken, 2012). Also, previous work has been conducted on the potential usefulness of online user-generated content as a source of usability issues (Hedegaard & Grue Simonsen, 2014).

Despite the general interest in evaluations conducted through online social platforms, only a handful of empirical studies have been published on this topic. These studies cover a diverse set of aspects that may be of relevance for understanding the benefits and limitations such evaluations.

Two studies have investigated the characteristics of the design feedback gathered through such evaluations (Følstad, Fjuk, & Karahasanovic, 2012; Følstad et al., 2013). In these, the researchers distinguished between positive design feedback, problems or concerns, and constructive comments including suggestions for change. Design feedback containing suggestions for change was judged by the designers as more useful than the remaining feedback. One of these studies investigated the effect of an active moderator as well as the effect of seeing other users' comments (Følstad et al., 2013). The study found that an active moderator positively affected the users' tendency to contribute constructive comments, hence generating more useful design feedback.

One study has investigated an online social platform used to gather design suggestions from users (Cowley & Radford-Davenport, 2011). The study compared online discussion forums with regular focus groups. Users in the discussion forum were found more often to reply to the stated questions; hence, each user in the forum condition contributed on average more comments to each question posed by the moderators. However, the focus groups were found to generate richer and more in-depth conversations

between the users. No difference was found between the discussion forum and the focus group conditions concerning the number of design suggestions made by the users.

Two studies (Bruun, Gull, Hofmeister, & Stage, 2009; Smilowitz et al., 1994) have targeted users' self-reporting of usability problems through online social platforms. The studies compared self-reporting of problems in online forums to problem identification in lab-based usability tests. Both studies found that users tended to under-report usability problems in the forum context. This finding should remind us that users' design feedback is not to be seen as a substitute for data from traditional usability testing, but rather as an approach to gather complementary insight.

A second limitation to online social platforms as venues for user-centred evaluations concerns the ratio of noise to valuable feedback (Hilbert & Redmiles, 1999). Følstad and colleagues (2013) found the design feedback gathered through their online social platform to contain a relatively large proportion of low-usefulness contributions. Friedrich (2013) made a similar observation, noting that online social platforms may make it too easy for the participating users to criticise others' contributions without providing constructive suggestions.

The existing research on online social platforms as venues for evaluations with users, however, is silent concerning key areas of interest. First, whereas the output of such evaluations have been made subject of some studies, we still need more knowledge on how we should understand the different types of feedback. This lack in knowledge is particularly relevant given the large proportion of low-usefulness contributions found in previous studies. Second, the existing research does not concern how such design feedback is perceived by its recipients, that is, the development teams that have commissioned the evaluation. This lack in knowledge is critical, as the evaluation characteristics should match the development teams' needs to strengthen downstream utility. Third, the research does not concern how users experience evaluations conducted through online social platforms. This gap is also potentially critical, as the user experience arguably may affect users' willingness to participate in such evaluations and, by extension, the quality of the evaluation output.

## 3. Research questions

Given the substantial knowledge needs concerning evaluations by means of online social platforms, a broad and exploratory research question was set up for this study:

> *What are the benefits and limitations of design feedback from users gathered by means of online social platforms?*

On the basis of key areas of interest identified above, we formulated three sub-questions:

> *RQ1: How should we understand the different types of design feedback gathered from users by means of an online social platform?*
>
> *RQ2: How do development teams perceive and utilize users' design feedback gathered by means of an online social platform?*

*RQ3: How do the participating users experience providing design feedback by means of an online social platform?*

We formulated no hypotheses concerning the particular outcome of the study to allow for an investigation unbiased by the assumptions of the researchers.

# 4. Method

The research questions required a research design that allowed us to capture rich insights in the experiences of development team representatives and the participating users alike. To meet this requirement, we followed a case study approach (Yin, 2009) implemented in the context of real-world design projects. To avoid possible biases related to conducting only one case study, we decided on a multi-case approach including four cases. For each case, we gathered data from a development team representative and the participating users, and we also analysed the users' design feedback.

## 4.1 Cases, set-up, and participants

The four cases were gathered from three different companies and represented different sectors and application areas. Furthermore, the cases represented different stages of the design process, from early design concepts to detailed visual prototypes of user interfaces.

- **Case 1** was a mature visual prototype of the user interface of a Web-TV solution. The prototype was highly detailed, illustrating the functionality of the Web-TV solution as well as example content.
- **Case 2** was an innovative concept for self-service troubleshooting in the context of wireless broadband routers. The troubleshooting process was presented in brief texts and illustrations showing how different channels could be used when escalating the troubleshooting process.
- **Case 3** was an innovative concept for telecommunication via a desktop computer. The concept was presented in brief text and illustrations showing its intended key features.
- **Case 4** was an early visual prototype of the user interface of an organisation's intranet solution. The prototype illustrated key features, but did not include example content.

For each case, one development team representative was responsible for the material to be presented to the users and for the uptake of the design feedback in the development process. Each development team representative was either the project leader, the case owner, or the leader of the particular design activity.

In all four cases, we gathered design feedback from the users through a special purpose online social platform, the RECORD online Living Lab (http://recordlivinglab.org/). Upon entering the online platform, the users were provided initial instructions and descriptions of their role. In particular, they were told that their role was to provide feedback on the system or solution and that this feedback would be useful in the development work. They then were presented to a design in the form of a visualised concept or visual prototype together with questions and task descriptions intended to elicit design feedback. The

questions typically concerned what the users liked in the designs, what they saw as potential problems or difficulties, and whether they had suggestions for changes or improvements.

The users were to provide feedback as free-text comments and ratings. All users had immediate access to the design feedback provided by the other users, as well as any moderator comments, via a comment thread adjacent to the comment field. The users could also comment on the design feedback of others; when they did, the user having provided the original comment was notified by an email including a link to the webpage containing the design feedback in question. As a low-threshold feedback option, the users could also "like" comments provided by others. This option, however, was not much used by the users in any of the cases and the results from this functionality have not been included in the study analyses. To keep the user interface of the social platform as simple as possible, it did not include other social features such as private messaging, group formation, or listings of most popular or most replied to comments. The users did not have the opportunity to configure the visibility of their comments; all user comments were visible to all study participants, though not accessible for anyone not part of the study. To protect the anonymity of the users, the users initially selected a nickname so that they could participate under pseudonyms.

The design feedback collection was supported by one or two moderators; one in Case 1-3 (the first author of this paper), two in Case 4 (the first and second authors of this paper). The moderator was to have an active role, that is, to reply to user comments with the aim of motivating increased participation and more detailed user comments. In particular, the moderator was to (a) acknowledge relevant and useful user comments, (b) ask follow-up questions in response to user comments that could benefit from being further detailed, and (c) challenge user comments that provided highly controversial points of view. The moderator replied to the user comments through the same commenting mechanism as that of the participating users. To make clear that a given comment was made by a moderator, any moderator comment stated that it was made by a person responsible for the study. The moderator checked in on the study several times each day of the study period to follow up on new user comments. In Case 4, the two moderators agreed on a common style of commenting, based on the three types of moderator comments outlined above, and collaborated closely to avoid bias concerning moderating style.

The design feedback collection was also monitored by the development team representatives. These representatives were given the choice between taking an active, commenting role or a passive observing role. In all four cases, the representatives ended up taking the role of observers.

To provide an illustration of the online environment used in the cases, Figure 1 presents an example screenshot from Case 4.

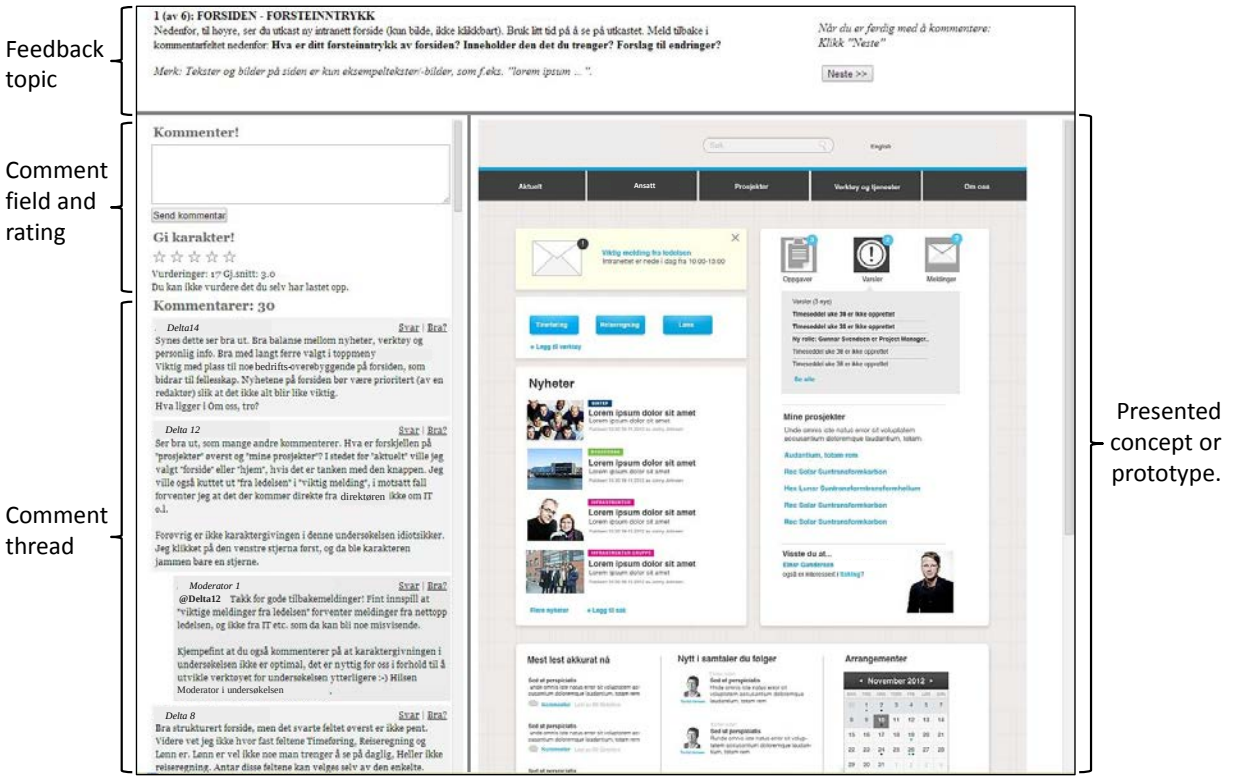


***Figure 1.*** Example screenshot from the online environment (Case 4). The upper panel contains a description of the feedback topic. The left panel contains the comment field, rating, and comment thread. The main panel contains a visual prototype. The case-specific content of the screenshot is anonymised.

The users in Cases 1–3 were recruited from a national panel for marketing research. For each case, we used a small set of filtering questions to identify relevant users. The users in Case 4 were recruited from within the organisation for which the intranet was intended. Upon accepting the invitation to participate, the users received a brief set of instructions and entered their background data before being presented to the designs. To ensure the motivation of the users, as well as their relevance as providers of feedback, all user participants were required to be regular users of the solutions or services currently provided by the case owners. As incitements, the users of each case entered a lottery for five 30-Euro gift cards. Table 1 provides details on the participating users ($N$=518).

**Table 1**

*User participant details for each of the four cases*

| Case | Object of design feedback | Participant filtering criteria | Participants Count | Age Mean (*SD*) | Gender % males |
|---|---|---|---|---|---|
| 1 | Web-TV, detailed visual prototype | Use current Web-TV solution weekly or more | 254 | 44 (16) | 67 |
| 2 | Wireless broadband, early concept description | Customer of the broadband provider<br>Smartphone user | 99 | 43 (16) | 63 |
| 3 | Telecommunications, early concept description | Customer of the telephone provider | 92 | 47 (18) | 43 |
| 4 | Intranet solution, early visual prototype | Recruited from within the organisation | 73 | 44 (12) | 63 |

The variation in cases and user characteristics serves to strengthen the research design. This multi-case design helps us avoid biases related to the possible idiosyncrasies of a single case, and allows us to generalise and challenge our findings.

## 4.2 Data collection and analyses

We conducted data collection and analyses on three levels for each case to gain insight into the relevance for each of the research questions.

### The design feedback (RQ1)

In all four cases, we exported the design feedback, along with any moderator or development team representative replies, from the online social platform for analysis in a spreadsheet. This arrangement allowed us to explore and better understand the types of design feedback that had been gathered. Following a coding scheme for free-text evaluation data presented by Følstad and Knutsen (2010), we first coded the design feedback as containing (a) positive feedback, (b) problems or negative feedback, and/or (c) suggestions. The same comment could be coded as containing none, one, or several of the feedback types. Then, within each of these feedback types, we conducted a thematic analysis (Ezzy, 2002) to identify common themes within each of these three broad categories. Finally, we compared the prevalence of the different types of feedback topics on an individual versus group level.

### The development team perspective (RQ2)

We investigated the development team perspective through post-factum data collections. In each of the four cases, we conducted an interview with one of the development team representatives. The interview guide for the development team representatives concerned their reflections on the study set-up, including its strengths and weaknesses, and how they had used, or planned to use, the study output in subsequent design. In particular, we asked them to reflect on the user comments being openly available to all user participants and the role of the study moderator. We also encouraged the development team representatives to point out examples of design feedback in the studies that they had found useful, and explain why this feedback was useful to them.

The interviews were audio recorded and transcribed. We conducted a thematic analysis to identify common themes. Then we conducted a content analysis to code the data according to the emerging themes (Ezzy, 2002).

### The user participant perspective (RQ3)

We also investigated the user participant perspective through post-factum data collections in all four cases. In Cases 1–3, we invited all participating users to respond to a questionnaire concerning their experience. We distributed the questionnaire 1–3 weeks after participation. The questionnaire included questions on the users' reasons for contributing (or not contributing) design feedback, the perceived usefulness of interacting with the other users and the study moderator, and the usability of the online social platform. The users were encouraged to provide free-text answers for the key questionnaire topics.

With the aim of gathering richer data on the user perspective than practically feasible through a questionnaire, we decided to gather data on the user participant perspective through semi-structured interviews for one of the cases. Hence, in Case 4, we interviewed a small number of users randomly drawn from the pool of participating users rather than gathering these data by questionnaire. The interview guide included questions on the same topics as the questionnaire. Each interview lasted 5–15 minutes.

The interviews with the users in Case 4 were audio recorded, transcribed, and analysed following the same process as for the interviews with the development team representatives. Likewise, we examined the free-text answers from the questionnaires in Cases 1-3 through an initial thematic analysis followed by a content analysis to code the data.

# 5. Results

## 5.1 Types of design feedback (RQ1)

The user participants generated a wide selection of design feedback. Across the four cases, a total of 1647 user comments were gathered and analysed. Of the 518 users that registered for the study, 352 provided one or more comments. Table 2 provides an overview of the number of comments, as well as the number of comments containing positive feedback, problems/negative, and suggestions.

**Table 2**

*Details on the user participants' comments across the four cases*

| Case | Commenting participants | Total comments | Positive feedback | | Problem/negative | | Suggestion | |
|---|---|---|---|---|---|---|---|---|
| | | | Comments | Themes | Comments | Themes | Comments | Themes |
| 1 | 189 | 882 | 605 | 44 | 314 | 64 | 211 | 68 |
| 2 | 71 | 291 | 185 | 25 | 99 | 33 | 35 | 22 |
| 3 | 56 | 322 | 102 | 18 | 142 | 21 | 82 | 21 |
| 4 | 36 | 152 | 50 | 9 | 60 | 16 | 97 | 39 |
| | 352 | 1647 | 942 | 96 | 615 | 134 | 425 | 150 |

We found the users' comments to group into *themes*, that is, issues addressed by one or more comments. Comments addressing the same theme might strengthen or supplement each other. Consider the three sets of example comments in Table 3, belonging to a positive theme, a problem/negative theme, and a suggestion theme respectively. Note how the different comments partially rephrase the underlying issue and partially contribute new perspectives. For example, in the problem theme, the users were in agreement concerning a problematic lack in choice on the front page of the Web-TV website. In addition, one user added the perspective that it might be desirable to browse programs by topics, and a second requested a way to choose between program categories.

**Table 3**

*Example theme types and comments from Case 1, illustrating a positive theme, a problem theme, and a suggestion theme*

| Example theme type | Example comments |
|---|---|
| **Positive theme:** Web-TV design perceived as having a fresh and modern visual appearance. | I like the first impression. Large, clear images give a modern expression […] |
| | This is more forward leaning, a bit of colour makes the difference. Still looks like a nice and tidy front page. |
| | It is great that the design now is rounder/more flowing as it makes it look updated […] |
| | Fresher. Gives me a warm feeling. |
| **Problem/negative theme:** Difficult to explore the wide range of video content offered by the Web-TV provider. | Clear prioritization. But too little content to choose from. […] What if I am looking for a particular topic? |
| | […] here the webTV provider makes the choice for me in too great degree. |
| | […] Not enough content on the front page. And no way to choose between program categories. […] |
| | […] Too little screen space reserved for the TV programs presented below the main panel - too few choices available on the front page. |
| **Suggestion theme:** Maybe add more information on pages presenting individual programs. | […] The amount of information presented is ok. What about also including links to program reviews etc. |
| | […] can you press the images for more information about the program? This should be possible. |
| | This is better. Still miss program duration (minutes) […] |
| | Great improvement […] Still miss viewer feedback options and program reviews. |

At times, users offered diverging opinions in their comments. In such cases, the comments were grouped in a positive theme as well as a problem/negative theme. Both themes where then presented to the development team, to reflect diverging perspectives on an issue. The user comments could also complement each other in terms of problems and solutions; while some comments identified a problem, others suggested a possible solution. For example, in Case 1, a number of users identified as a problem that the items of a program listing page were presented as text only. Others contributed the explanation

that this was potentially good for mobile viewing, while still others offered suggestions for alleviating the problem (see Table 4).

**Table 4**

*Case 1 example of how comments serve to expand on and suggest solutions to identified problems*

| Different comment roles | Example comments |
|---|---|
| Problem identification | I see that quite a few have touched upon this already, but this was too much text for me crammed into too little screen space […] |
| Offer explanation | […] This solution works well on smaller screens such as tablets or mobile phones. |
| Suggest solution (1) | […] the text is too "tight", possibly you could make an increase in the spacing between the lines. |
| Suggest solution (2) | […] it would be nice with somewhat larger text font, or perhaps configurable text size. It had also been nice to be able to choose whether or not to have pictures in the list. |

A particularly interesting finding in our analysis of the design feedback arose from our comparison of the number of comments to the number of themes for each type of design feedback: Though mere positive feedback was the most frequent comment type, we found that positive themes were much less frequent than, for example, suggestion themes. This because the positive comments grouped into much fewer themes than did the suggestion comments. Going back to Table 2, this shows that in Case 1, for example, the 605 positive comments addressed only 48 themes, whereas the 211 suggestion comments addressed a total of 68 themes. Figure 2 clearly illustrates this difference in the number of comments and themes for each type of design feedback; the numbers presented here are calculated on the basis of those presented in Table 2.

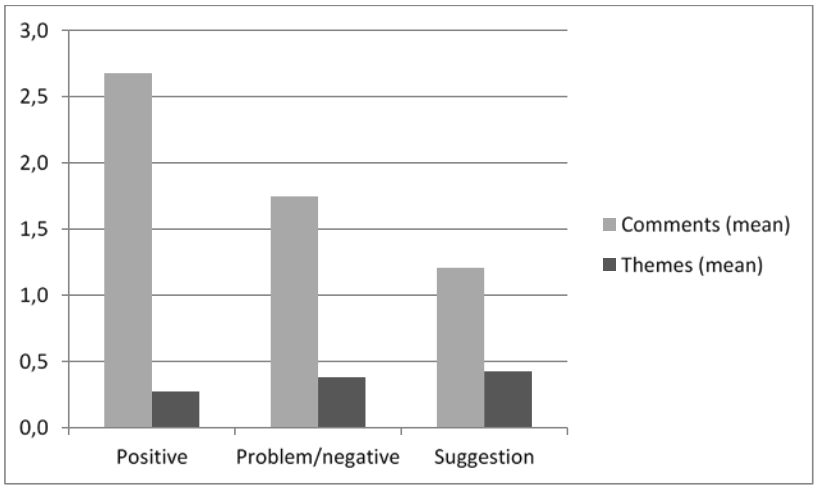


***Figure 2:*** Mean number of comments and themes contributed by users for each feedback type (all four cases seen together; *N* = 352).

Though each individual user contributed a relatively low number of suggestions and a high number of positive comments, the group contributed relatively more suggestion themes and problem themes than positive themes. In particular, the prevalence of suggestion themes on the level of the user group may be beneficial to the perceived usefulness of design feedback through an online social platform. This finding highlights the importance of paying particular attention to the thematic diversity in constructive design feedback.

## 5.2 The development team perspective (RQ2)

We interviewed four development team representatives, one from each case. The interviews concerned the representatives' experiences of the obtained design feedback and the process of gathering such feedback through the online social platform.

During the gathering of design feedback, all development team representatives had taken the role of observers, though they were offered the opportunity to participate more actively. Two had decided to take an observer role prior to the start-up of the study, one had decided to take an observer role provided that the moderator function was perceived as satisfactory, and one had wanted to hold a more active role but was eventually not able to do so due to time constraints. None had previous experience concerning design feedback from users by means of online social platforms, though all were familiar with other evaluation methods for eliciting design feedback from users (e.g. focus groups, questionnaires, and user reports during beta testing).

The perspectives of the development team representatives are grouped under the following headings: perceived benefits, perceived limitations, and advice for future use.

### Perceived benefits

The development team representatives reported the design feedback to be useful on several levels. They argued that the design feedback improved the development team's insight into the users' needs and competencies. They also expressed that the design feedback was useful as input into ongoing design discussions or idea generation. Finally, they argued that the design feedback was useful in identifying problems and refining the design.

> *"This has in a way opened our eyes somewhat to that we need to be even more explicit on what we want to achieve with what we are developing."* (DTR W) [1]

The representatives reported that the design feedback was useful both on the level of individual comments and in its totality. The users' raw comments, formulated during the study, were seen as a potentially important source of insight. At the same time, they argued the totality of the user comments

[1] Because only one person was interviewed for each case, we do not provide information on which case the different quotations come from, as this could potentially compromise the anonymity of the respondents. The respondents are referred to as DTR (development team representative) W, X, Y, and Z, but the ordering of the respondents does not reflect the ordering of the cases.

when seen together to be important, as the urgency of an issue was considered to be reflected in the number of users voicing it.

> *"[…] it is more interesting when you see several of this kind of comment. That is, it is the sum that makes it interesting. Also, individuals may come with suggestions that actually are interesting. Whether anyone else has mentioned it or not."* (DTR W)

The development team representatives appreciated the open-ended nature of the feedback process. In particular, they appreciated the opportunity for the participating users to reflect on each other's contributions while being allowed a relatively free form of expression. The free form of the feedback seemed to make it more compelling or persuasive.

> *"[…] we got a lot of useful feedback from the participants. That is, direct feedback. It is open dialogue. There are many issues brought up during the study that I will remember for a long time […]."* (DTR X)

The development team representatives reported that they saw it as valuable to follow in real time the process of gathering design, as opposed to, for example, being presented a report on the basis of the gathered data. The immediate access to the data gathering process was argued to increase the credibility of the study. Following the study in real time was seen as an opportunity for the development team representatives to reflect on the user feedback as it evolved.

> *"[…] I find that following the study as the feedback comes in, and following the dialogues, gives a richer picture. […] I find that it adds value to follow the discussions, following the input as it comes in and not just get it served in a final report […]."* (DTR Y)

The development team representatives also saw following the study in real time as a potential safety mechanism in the case of something not going as planned. For example, if details in the presentation had caused the participating users to get an erroneous impression of the object of evaluation. The representatives speculated that in such events they could have made changes to the study set-up or clarified misconceptions.

### Perceived challenges

The development team representatives reported several limitations or challenges concerning the gathering of users' design feedback through an online social platform. In particular, the lack of direct contact and control with the user participants was reported to be an important limitation. The representatives argued that the quality of the feedback depended on the competency and motivation of the participating users, and that it could be difficult to control for these factors in the online environment. The opportunity for dialogue between the user participants was appreciated, but the representative in one of the cases argued that the dialogue had been insufficient. One representative also reported that the users did not sufficiently respond to the moderator's follow-up questions.

> *"In this case I did not find that [the dialogue between the users and the moderator] worked well; that we did not get much added value from this. You could see people referring to each other's open comments, but there were not many direct replies to others."* (DTR W)

Though the development team representatives were in agreement on the usefulness of a moderator during the gathering of user feedback, they held that the moderator role could be challenging; especially if the moderator did not have sufficient knowledge of the object of evaluation or the application domain. They suggested that this limitation would be mitigated by a closer integration of the development team in the feedback process.

> *"[…] In hindsight I see it as beneficial that you took the role as a moderator in a way. However, possibly, at times you would have needed more background knowledge to provide better answers."* (DTR Z)

The development team representatives also argued that design feedback from users through an online social platform is not to be seen as a kind of usability test that supports reliable identification of usability problems. One of the representatives accentuated that the success of the user study in his case was dependent on methods' strengths and limitations being clearly explicated up front. Furthermore, the representatives saw it as potentially challenging that the user feedback sometimes was diverging, for example when some users reported something to a problem while others reported it not to be. The success of the study therefore could be dependent on the study leader's ability to provide a coherent analysis of the study findings.

> *"[…] This generates discussions in the project team that would not have automatically appeared if it had not been for this study. However, it is somewhat challenging that the study findings do not clearly tell us to do this or that. This makes it difficult for the project team to handle the feedback."* (DTR W)

### Advice for future use

The development team representatives had several suggestions for improving the online social platform and the overall process of gathering design feedback. In particular, they saw the process leading up to the gathering of user feedback as a potential subject for improvement. Three of the representatives reported that they would have liked even more in the way of process support the period preceding the gathering of design feedback. They especially wanted guidance on how to present concepts that communicate well to the users and how to identify and prioritize feedback topics.

> *"[…] It would have been useful prior to the study, to be even clearer on how questions should be posed to the participants, what kind of answers to expect, and how we should use these answers. […]."* (DTR Y)

The development team representatives were unanimous in their advice concerning when design feedback through an online social platform would provide the most value: as early as possible in the design or development process. They argued that this approach made it practically possible to bring in users at an early point in the design or development process. Furthermore, because much of the user feedback concerned ideas for refinements or improvements in the designs, they argued that it would be more useful to get such feedback at a point in the design process when it was still relatively easy to make changes at a conceptual level.

*"[…] For us, this is an interesting way of getting to do testing early. This we have not done much of before, so here we, in a way, lack quite a bit. Often we go on too long without testing. This is a nice way to test early to see the lay of the land from the perspective of the users."* (DTR W)

## 5.3 The user participant perspective (RQ3)

In Cases 1–3, we invited all 445 user participants to complete the post-factum questionnaire. Here they were to report on their experiences of providing design feedback through the online social platform; 320 of these completed the questionnaire. In Case 4, we randomly selected a total of 36 users from the pool of user participants and invited them to a post-factum interview; 13 of these responded to the invitation and took part in the interview. Below we present their perspectives on the studies in general and the online social platform in particular, including their reasons for contributing (or not), their perspectives on the opportunity to interact with the other user participants and the study moderator, and other experiences with the online social platform. When presenting the findings on the user participant perspective we provide a summary overview of the findings on the basis of the questionnaire data from Cases 1-3 and complement these with our analysis from Case 4.

### Reasons for contributing (or not)

In the post-factum questionnaire, we asked the users to provide, in free-text, their most important reason for contributing or not contributing in the study. We asked users having made three or more comments, "What was the most important reason for you to contribute comments in this study?" We asked those have made fewer comments, "What was the most important reason for you not to contribute more comments in this study?". Table 5 summarises the reasons reported by at least three users.

**Table 5**

*Reasons for high degree of commenting (≥3 comments) and low degree of commenting (<3 comments) reported by three or more users*

| Reasons for high degree of commenting (*n*=163) | Freq. | Reasons for low degree of commenting (*n*=131) | Freq. |
|---|---|---|---|
| Contribute to the development | 50 | Own points made in others' comments | 27 |
| Express own opinion | 44 | Did not have anything to say | 24 |
| Engaging/relevant topic | 28 | Technical problem/user problem | 18 |
| Comply with the study instructions | 19 | Did not have enough time/too time demanding | 11 |
| Interesting type of study | 5 | Not sufficiently engaging/relevant | 11 |
| Economic reward | 3 | Did not see the need to comment | 9 |
| | | Lack in competency on the feedback topic | 8 |
| | | Did not like others to see own comments | 3 |

The most frequently reported reason for commenting was that the users wanted to contribute to the development process. That is, the users reported that they saw their own contributions as beneficial to improving the quality of the system under development. This motivation was also reflected in the user interviews of Case 4. Here, the feedback object (a visual prototype of a new intranet) was going to be introduced in their company, and they wanted to influence their own working situation. Hence, the

possibility to be heard and to make a difference was valued by the users. In particular, they saw themselves as holding insight that would be useful for the development team, for example, to help them identify critical issues in the visual prototype.

> *"I want to influence the situation. I am one of those that have working experience also from other organizations, and thereby I have some experience concerning intranets. And I wish to make the organization think through what is important to us."* (P4)[2]

> *"[…] I have been in [the organization] for a substantial number of years, and if nothing else I know very well how I use the current intranet solution."* (P1)

The second and third most frequent reasons for contributing, as reported in the questionnaires, were that the users appreciated the opportunity to express their opinions or that they found the topic of the feedback study to be "interesting" or "engaging." The user interviews allowed us to get some in-depth insight into the latter of these motivations. Here the users reported being engaged in the study, in part because of a deeply felt need to improve on the intranet as a work support system, and in part because of an interest in the study topic in general.

> *"What motivated me were actually a few things in the current intranet, as well as in the presented prototype, that I have been missing."* (P11)

> *"Well, as I have some work experience with user interfaces in computers, I have this interest."* (P6)

The reason for low degrees of commenting most frequently reported in the questionnaire was somewhat surprising: the users reported not commenting because the point they wanted to make had already been made by others. We find this reason surprising because we assumed that similarity in opinion would represent an opportunity to elaborate on others' comments rather than just passively reading likeminded comments and leaving them uncommented. The user interviews served to accentuate and fill in with regard to this reason for low commenting, as the users here also argued for leaving likeminded comments uncommented and reported to do this for the study to yield a coherent and not too repetitive set of feedback.

> *"[…] It was very good to see the others' comments […] so that we did not repeat ourselves too much."* (P3)

> *"It was great [to see the others' comments] so that I did not have to comment on what others had already said. I could, if necessary, agree or not."* (P9)

The users also expressed concern that many comments regarding the same theme would only generate more work for the recipients of the comments without adding new insight.

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[2] For all user quotations, gathered from the 13 user participant interviews, we report the source in terms of a participant number ranging from P1 to P13.

> *"There is no point in agreeing with a comment [...]. I think it will give unnecessary text for you to analyze."* (P10)

Only one of the interviewed users expressed concern that such a lack of commenting in the face of likeminded comments could represent a loss for the study.

> *"[…] What you might lose [in this approach] is whether someone agrees with what is already contributed […]."* (P8)

Other reasons for not commenting were less surprising. In particular, the users in the questionnaires reported not having anything to say, not seeing the need to make comments, and not being engaged in the study as reasons for not commenting. These reasons are to be expected among a large group of participants. Furthermore, it is reassuring to note that only three of the user participants reported that their lack in commenting was due to not being comfortable with making comments for others to see.

### Perspectives on the opportunity to interact with other user participants and study moderators

A key feature of an online social platform for gathering design feedback is to foster interaction within the group of user participants as well as between user participants and development team representatives or moderators. We assumed that such interaction would increase the richness in the users' design feedback and thereby its usefulness in the design process.

In the post-factum questionnaire, we asked the participating users to report on "the degree to which you found it useful to interact with others in the study (for example by seeing their comments, answering their comments, or getting responses to your own comments)." They reported separately on the perceived usefulness of their interactions with other users and their interactions with the study moderator. The questionnaire also asked them to report on "the degree to which they built on others' ideas or suggestions when making their comments." See Table 6 for an overview of the findings.

**Table 6**

*User responses on the perceived usefulness of interacting with others in the study and the degree to which they built on others' ideas/suggestions, for participants with a high degree (≥3 comments) and a low degree (>3 comments) of commenting*

| Items | Users with high degree of commenting | | | | Users with low degree of commenting | | | |
|---|---|---|---|---|---|---|---|---|
| | *n* | Low/very low degree | Neutral | High/very high degree | *n* | Low/very low degree | Neutral | High/very high degree |
| Useful to interact with other users | 153 | 18% | 37% | 45% | 120 | 42% | 37% | 21% |
| Useful to interact with study moderator | 152 | 10% | 30% | 60% | 113 | 35% | 31% | 34% |
| Built on others' ideas or suggestions | 160 | 47% | 30% | 23% | 119 | 57% | 35% | 8% |

**Interacting with other users:** We see that a substantial proportion of the participating users found it useful to interact with others in the study. In particular, the users with a high degree of commenting tended to find such interaction useful.

Questionnaire free-text answers from users who found it highly useful to interact with other users (*n* = 86) provided some insight into the quality of interaction. Most just reported that they liked this interaction, or plainly stated that they had some kind of interaction, without going into detail. Those that actually described their interaction in some detail, often reported to read others' comments without responding (14 of the users).

In the interviews, seven of the 13 interviewees reported that the dialogue conducted through the online social platform was useful or that they found it inspiring to build on other users' comments.

> *"[…] you get to learn from the others' comments, get input for your own comments, and also get triggered to make more comments which gives better input to those running the study."* (P10)

**Interacting with a study moderator:** In the post-factum questionnaires, a substantial proportion of the users reported it to be useful to interact with the study moderator (60% of the high-degree commenters; 34% of the low-degree commenters). Likewise, the 13 interviewees also noted the usefulness of interacting with the study moderator. The users in particular interpreted interactions with the study moderator as a sign that their contributions actually were attended to and could be of consequence. Prompt responses by the moderator were highly appreciated. Nine of the 13 interviewees reported that they saw the interaction with study moderators or fellow user participants as a token of their own comments being seen.

> *"[... the moderator comments] were an important aspect of the study. And, to me, it was a sign of quality, that [the moderators] were 'hands on' the study."* (P10)

> *"[...] and especially that the response come so quick made me feel that my comment was, that what you suggested was noticed."* (P1)

**Building on others' ideas or suggestions:** In response to the post-factum questionnaire, 23% of the high-degree commenters and almost none of the low-degree commenters reported to build on others' ideas or suggestions. Though the users found it useful to interact with others (something that implies an appreciation for the co-creative nature of the study) most did not engage in full-fledged co-creation, that is, building on the suggestions and ideas of the other users.

Seven of the 13 interviewees reported that they were building on others' comments, and also provided some detail on the process of building on each other's contributions.

> *"[…] it is possible to see others' comments and comment on these. This gives an opportunity for dialogue, and also, so to speak, to develop the perspectives […]."* (P2)

> *"[…] the comments, compared to an ordinary survey, starts thought processes in oneself when you are about to answer; more so than would be the case if you just fill out a form."* (P8)

The interviewed users also noted that they would have liked to see more interaction among the user participants and the moderators.

> *"[…] I would have appreciated more interactivity in the feedback. I am not sure whether others actually commented on my feedback, or whether others did see my comments on their feedback."* (P5)

The interviewees mentioned that one obstacle to build on other users' comments was that they did not find the time to engage sufficiently in the study. One also mentioned that a possible obstacle to dialogue was that the number of comments grew too large during the study to get an adequate overview, which in turn induced passivity.

### Other experiences with the online social platform

In the post-factum questionnaires, we asked the users about problems related to the online social platform, aspects of the platform that worked well, and change recommendations. Also, we asked users to rate the usability of the platform on a ten-item standard measure, the System Usability Scale (SUS) (Brooke, 1996).

Most of the participating users found the online social platform to be acceptable. The majority (128 of the users) stated that the platform in general worked well or addressed specific aspects of the platform that worked well. The average SUS score for the platform was 73,5 (*SD* = 19,5); scores over 70 indicate good usability (Bangor, Kortum, & Miller, 2008).

## 6. Discussion

The presented study has contributed new insight into the benefits and limitations of online social platforms for gathering design feedback in evaluations with users; in particular, concerning (a) the types of design feedback that may be expected, (b) development teams' perceptions of the design feedback, and (c) the participating users' experiences. Each of these are discussed below.

### 6.1 Types of design feedback (RQ1)

The four cases provided rich insight into the types of design feedback that may be expected from users through an online social platform. Like previous studies (Følstad et al., 2013), we found positive users comments to be more prevalent than problem-oriented feedback or suggestions in three of the cases. Case 4 did not display this pattern, indicating that the relative proportion of positive comments, problem-oriented comments, or suggestions may be affected by case-specific characteristics. Although we lack empirical evidence to explain the cause of this difference between the cases, one possible cause could be that the users of this case felt a more immediate ownership of the design process as the object of design feedback (a new intranet solution) potentially could be implemented in their everyday work context.

Adding on to existing knowledge, we found that the sheer number of comments may not be a good indicator of the number of issues reflected in such design feedback. Though each user on average contributed more positive comments than problem-oriented comments or suggestions, the number of positive themes addressed by the users was smaller than the number of problem-oriented themes or suggestion themes. That is, each positive comment did not contribute a novel perspective to the same degree as did each negative comment or suggestion. Rather, the positive comments tended more towards repeating already stated themes. Hence, though each individual tended to contribute mostly positive comments, the groups contributed a broader range of suggestions than positive comments and problems.

This finding illustrates the value of involving a large number of users when gathering design feedback, as a larger number of users implies more suggestion themes. This highlights one key benefit of online social platforms for design feedback, as such platforms allows for involving a large number of users at little additional cost in terms of set-up and administration. Across the four cases, approximately every third suggestion comment contributed a new suggestion theme. Given our knowledge that change suggestions are more appreciated by development teams than positive comments (Følstad & Knutsen, 2010) or mere problem identifications (Hornbæk & Frøkjær, 2005), new suggestion themes particularly increase the value of the design feedback.

Involving a relatively large number of users may also be beneficial in other respects. In particular, we found the gathering of design feedback from large groups of users in the studied cases to help identify themes for which disagreement exists. Furthermore, this broad involvement of users allowed them to expand on themes identified by others, such as offering explanations or suggestions in response to identified problems. Such examples are in support of the hypothesis of Vanattenhoven and Jans (2007), who suggested that online social platforms may support beneficial synergy between the participating users.

## 6.2 The development team perspective (RQ2)

The reports from the development team representatives in the four cases indicate a number of benefits from gathering design feedback through an online social platform. This is in line with what is expected from users' design feedback in general (ISO, 2010; Kujala, 2003).

The design feedback was reported as useful for problem identification, input concerning design suggestions, and general insight in the context of use for the concept under development. However, the development teams did not seem to accept the design feedback without having it questioned or challenged. Rather, the design feedback motivated discussions in the design team, something that in turn led to reconsiderations and refinements of the proposed concepts and designs. This way of utilizing the design feedback indicates that it was perceived as inspirational material, that is, material that spawns new insights and ideas in the development team, rather than a listing of user requirements to be blindly adhered to. This interpretation is strengthened by the development team representatives reporting to benefit from having access to the individual user comments and the real time gathering of design feedback. Separate individual comments and the real-time unfolding of the design feedback would likely have been considered irrelevant if the goal was only to generate a list of issues to be fixed in

subsequent design. However, as a source of inspiration for the development team, such qualitative input may be important to start beneficial creative processes.

The development team representatives also noted a number of limitations or challenges in this approach to gathering design feedback; in particular, the lack of contact and control with the user participants. This indicates the need to treat design feedback through an online social platform as an evaluation method with its particular strengths and limitations; a method that may serve as a compliment to other evaluation methods, such as usability testing. Researchers and practitioners taking up this approach to gathering design feedback from users should be aware of its characteristics, strengths, and limitations.

The development team representatives argued that the approach was particularly suitable for early-phase design feedback. This characterization is highly interesting. In the early phase of the design process design feedback from users is seen as particularly beneficial (Kujala, 2003) while the practical obstacles to user involvement in this phase, such as time and resources, may cause development teams to skip gathering early-phase user feedback (Følstad et al., 2013; Kujala, 2003; Yndigegn, 2010). Given the benefits of gathering design feedback from users through an online social platform, identified in the four cases of this study, this approach could fill the need for such early design feedback from users.

## 6.3 The user participant perspective (RQ3)

Følstad and colleagues (2013) noted that, though online social platforms may generate useful design feedback from users, large proportions of such design feedback tend to be of limited usefulness. They suggested that a reason for this shortcoming might be that the participating users do not fully understand their role as contributors in a design process. Our findings enable a more nuanced perspective on this shortcoming. When asked about their reason for commenting in the post-factum questionnaires, the most frequent reason given among the high-commenting users was that they wanted to contribute to the development. Furthermore, the interviewed users reported that they found themselves to hold knowledge that they saw as useful in the development process. One interpretation of this finding is that a substantial part of the user participants see themselves as contributing to a development process and understand their role as contributors of insight that is not immediately available to the development team, contrary to the suggestion of Følstad and colleagues. Hence, other factors, such as individual differences in the users' ability to contribute, or practical constraints during participation (such as the time available for participation), should be looked into as alternative explanations for the high proportion of low-usefulness design feedback in online social platforms.

The majority of the users reported it as useful to interact with a study moderator, and about one-third reported that they found it useful to interact with other users. Most of the users, though, reported not to build on other users' comments. These findings indicate important challenges concerning online social platforms as means for gathering design feedback from users. Though a proportion of the participating users utilise the opportunity for beneficial synergy with others, the majority do not. There may be several reasons for this. It may be that the social nature of the presented design feedback studies differs too much from what users are used to in other online studies. Or it may be too demanding for the majority of the users to actively engage in others' contributions. Other aspects of the design feedback studies that may possibly be of relevance for users' tendency to build on other's comments include

moderator style and the level of involvement of development team representatives. Also the design of the social platform may be of relevance. Possibly, offering the users a wider range of social functionality, such as private messaging, functionality for group formation, or listings of most popular or most replied to comments, might increase their motivation to build on others ideas. It should, however, be noted that such additional functionality may also increase the user interface complexity, possibly making participation more challenging to some users. Future work is needed to fully understand and mitigate this limitation.

Concerning the challenge of social interaction in the online social platform, it was interesting to note that the most prominent reason for not commenting (27 of the users) was that others already had addressed the theme the user wished to address. This response indicates a lack in the users' understanding of why a social online environment was being used. Even though a theme has already been addressed by one user, the study administrator may find it highly useful that other users elaborate on the same theme, if only with an indication of their agreement and a reason for why they agree. It may seem as if the opportunity to click "like" is not sufficient to resolve this issue, as the "like" functionality included in the social platform used in the four cases was not much used by the users in any of the cases. Future work is needed to find ways to clearly show to the user participants that their voice is important, even though they agree with what has already been said.

Only three of the users indicated that they did not like to leave comments for others to see; that is, they did not like to participate in a social environment. One of these three was highly negative due to privacy concerns. Even though only a few of the users were negative about the social nature of the study, and the voiced privacy concern was unwarranted as the users were encouraged to protect their privacy by the use of nicknames, these responses indicate the need for study administrators to clearly present the nature of the study as well as the study privacy policy before user participants sign up. However, such a presentation should be made brief and precise not to interfere with an easy sign-up process.

## 6.4 Practical implications

On the basis of the identified benefits and limitations of users' design feedback in an online social platform, we suggest the following implications for the practical use of such platforms for design feedback in design and development processes.

- **Consider online social platforms for early-phase design feedback.** Online social platforms may be a useful approach to the gathering of users' design feedback in the early phases of the design and development process. The online gathering of feedback allows for flexibility, and the development team representatives agreed that this approach was particularly useful for early-phase feedback. Furthermore, the wide range of suggestions that may be gathered through this approach may make it particularly suited for early-phase design to support the exploration of opportunities.
- **Involve relatively large numbers of users.** An important benefit of online social platforms for users' design feedback is to gather a wide range of suggestions. To gather such a wide range of suggestions, a relatively large number of users, as compared to traditional focus group or interview studies, is needed. This because suggestion themes were found to be relatively more spread out among the participating users than were the positive and problem-oriented themes.

- **Acknowledge that experience is needed to handle diverging user feedback.** Involving a large number of users inevitably leads to divergence in the users' contributions which, in turn, implies the need for experience in handling user feedback. In particular, the users' design feedback should not be accepted unquestioningly, but should be used to identify underlying user needs and to motivate explorations of new opportunities.
- **Take an active role as moderator.** Both the development team representatives and the users reported the involvement of active moderators as beneficial. An active moderator clearly shows to the participating users that the design feedback is attended to. Furthermore, a moderator may help to clarify the objective of the study and to facilitate useful follow-up comments from the users.
- **Engage users through a clearly communicated purpose.** The users reported to be motivated by the opportunity to contribute in a design process. To benefit from such user motivation, it will be important to clearly communicate the purpose of the study.
- **Encourage interaction among users.** The key challenge in the gathering of users' design feedback is to get sufficiently rich contributions. We assume that a key to improving the richness in the contributions is to encourage the participating users to engage in interactions with each other and also with the study moderator. This challenge is addressed in the following section.

The identified benefits and limitations of users' design feedback through an online social platform suggest that this approach may serve as a valuable complement to established usability evaluation methods. In particular, it may serve as a practically feasible alternative to traditional methods for design feedback from users, such as interviews, focus groups or workshops. However, users' design feedback through an online social platform currently does not provide feedback from each individual user on the same in-depth level as would be expected, for example, in a focus group or a workshop. Hence, a larger number of users is required when using an online social platform for such design feedback than what would be recommended for a series of focus groups or workshops.

## 6.5 Limitations and future research

Though the presented study had a more comprehensive empirical set-up than what has previously been presented to study users' design feedback through online social platforms, it has its limitations. In the following, we will discuss the most important limitations in the study research design. Following this, we will discuss future research challenges related to interactions between user participants and moderators when gathering users' design feedback through an online social platform.

We see four important limitations in the study research design. First, the study addressed only single instances of users' design feedback, rather than investigating such feedback throughout complete design and development processes. Such long-term studies of users' design feedback would be a valuable contribution to our current knowledge, as they would provide increased insight into the relative value of such design feedback across different process phases. Second, all four cases of the study utilised a single online social platform for users' design feedback. This use of a single platform was beneficial as it makes generalisations across cases easier. However, it limits the study as other platforms are not directly studied. It would be beneficial in future research to include other platforms for social design feedback, possibly set up as comparative studies. Third, the same moderator and same moderator style was used across all cases (the first author of this paper); in Case 4 complemented with another moderator (the

second author of this paper). Though the use of the same moderator across all cases is beneficial for consistency across the cases, it makes it impossible to study the potential effects of different moderator styles. Furthermore, the moderators being the authors of the paper might in principle introduce expectancy bias to the moderator comments, though we sought to reduce the risk this by explicating in advance the types of comments that the moderator should make. It may be relevant in future research to explore the effects of different moderator styles by involving moderators that have no relation to the research and are trained to moderate discussions in different ways. Fourth, none of the four cases involved existing online communities for design feedback, but only invited potential users in online ad-hoc groups. This study of ad-hoc groups is useful as most design and development projects will not have available an existing online community of potential users. However, as the study does not address possible benefits and limitations of involving existing online communities, this will need to be made the subject of future research.

The future research suggested above, in response to the study limitations, represents relevant and useful extensions of our current knowledge. Nevertheless, we see the most important future research challenge not as related to limitations in the research design of this study but rather to the limited interaction between the users participating in the studied cases. Also, the interaction between the study moderators and users also held considerable room for improvement. Future research is needed to address this limitation, something that implies research challenges on multiple levels.

First, as the limited interaction between user participants may be due to individual differences between users, research is needed on which individual characteristics that determine users' tendency to engage in interaction and how to recruit participants accordingly. One possible direction for future research addressing this limitation is to consider individual differences in terms of inclination to participate in debate in general and online debate in particular, as this inclination might correspond to the individual's propensity to consider and respond to others' design feedback.

Second, as the limited interaction may be due to the design of the online social platform, interaction design research is needed to identify user interface features that may increase the user participants' awareness of each other's contributions and more clearly suggest the opportunity to build on what has already been contributed. Established social functionality that may be studied for this purpose include options for direct messaging and group formation, as well as listing and displaying popular or much debated user comments. Also, it may be relevant to design and explore new social features serving emerging user needs associated with online platforms for users' design feedback.

Third, as the limited interaction may be due to the process of gathering design feedback, research is needed on alternative processes for design feedback to improve the user participants' sense of engagement and commitment to the design process, and thereby increased their motivation to read and respond to others' contributions. In particular, it will be important to understand how to make users respond to, and build on, comments that express thoughts or ideas of which they agree with or are sympathetic to.

Though unanswered challenges remain, we hope that this study may motivate both future research and practical uptake of online social platforms as venues for gathering design feedback from users. In

particular, evaluations through such online social platforms seem to enable needed early-phase design feedback from users. Realising the potential of online social platforms for design feedback will strengthen and improve our ability to involve users in design and development processes.

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