

Evaluating Creativity Support in Co-Design Workshops

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ABSTRACT

Participatory, co-design and creativity workshops can lead to more useful, usable and innovative systems design. However, evaluating the effectiveness of the creativity support provided by different workshop techniques and activities is challenging. This is especially so with evaluation methods used whilst the workshop is taking place. In this paper we briefly outline the development of one simple method of evaluation we have designed whilst studying the use of data visualizations within creativity workshops. Here we discuss how reflective postcards were used within a simple workshop activity to replace the questionnaires we had previously used to collect evaluation data.

Author Keywords

Evaluation, Creativity Support, Co-Design

ACM Classification Keywords

H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

General Terms

Human Factors; Design;

INTRODUCTION

Participatory approaches to human-centred design, characterized by the active involvement of users and other stakeholders, can lead to more useful and usable systems [6]. Through practices such as co-creation [8] and creativity workshops [5], designers have elicited participants' latent creativity to inspire the 'fuzzy front end' of early stage design. In our research [4] we use interactive visualizations to make domain relevant data available and accessible to workshop participants. We do this because we believe that the growing amounts of data being generated by increasingly ubiquitous computing systems offer a new and important resource for design. In our workshops visualizations are explored in conjunction with structured creativity techniques and as part of making activities. This is to encourage participants to seek insight both in aspects explicitly represented in the visualization and through

sharing their prior knowledge and experiences. In this way we aim to support their preparation for generative design activities.

However, evaluating the effectiveness of this support during public workshops in which we aim to foster a relaxed atmosphere of playful, engaging creativity is challenging. Methods such as the experimental comparison of different conditions, close observation of participants engaging in activities or extensive use of video recordings feel inappropriate in this context. Similarly, issuing participants with questionnaires to complete is likely to highlight the academic nature of our research rather than the creative aspects of our workshop activities. This is especially so when we are seeking their responses soon after activities that take place early on in a workshop. Because of this we seek to develop alternative means of evaluation that can themselves become a part of the workshop's activities. In this paper we briefly outline the development of one simple method of evaluation that began life as two separate questionnaires and resulted in a workshop activity during which participants wrote three reflective postcards, addressing our concerns regarding support for insight seeking and creative collaboration.

STAGE 1: SEPARATE QUESTIONNAIRES

When evaluating the support a large-scale interactive visualization of student satisfaction data provided for collaborative ideation [3] we had used three separate questionnaires to address system usability [1], creativity support [2] and insight support. The third of these was a questionnaire we developed ourselves based on previous work outlining the nature of insight as discussed in the visualization community [7] and analysis of how such insights are acquired whilst visually exploring data [9]. Whilst each of these questionnaires were relatively successful in addressing the concerns they covered, it became obvious that the process of completing them all was a chore for participants. This, we also feel, had a negative impact on the length and quality of the responses to open ended questions we subsequently asked, and with which we probed participants' qualitative experiences.

STAGE 2: A SINGLE QUESTIONNAIRE

As a result of this, when we undertook a study comparing the effectiveness of two different styles of energy data visualization, when used in an ideation workshop setting, we decided first to separate out usability evaluation and then to combine the creativity support and insight support

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questionnaires into one. Here we wanted to design a very short and simple questionnaire that would quickly address participants' responses to the most salient aspects and form a small but nonetheless significant aspect of our evaluation. This resulted in a seven-part questionnaire that used a Lickert scale rating from 1 strongly agree to 5 strongly disagree. The first four statements are derived from the Creativity Support Index [2] and the final three from the insight support questionnaire we had developed based on visualization literature [7,9]. The questionnaire statements are listed below:

1. I was very engaged and absorbed using the visualisation. I enjoyed it and would do it again.
2. I was prompted to generate ideas that were new and varied.
3. I was able to work together with others easily.
4. I felt able to explore many different options, ideas or outcomes.
5. I could easily identify relationships and patterns in the data that contributed to new ideas.
6. It was easy for me to gain an overview of the data using the visualization.
7. I was able to combine my existing knowledge with insights from exploring the visualization to generate ideas that I had not previously considered.

This questionnaire was successful in capturing responses to our main concerns and its shortened length meant that it was no longer a chore for participants to complete. Yet it remained a questionnaire. When our work moved on from this experimental study to a public workshop in which we investigated service design with staff and customers of a major UK energy provider, we did not want to draw attention to academic concerns which, whilst important to us, were of no significance to participants and should not impact on their experience or design activity. We therefore wanted to address the same concerns but in a different format.

STAGE 3: REFLECTIVE POSTCARDS

We thought long and hard about different formats for gathering the evaluation data we required. We knew that the responses should be relatively short and we also knew that they should be directed towards answering specific questions. Finally we wanted them to feel in some sense creative and personal. The first idea we considered was to ask participants to respond in tweets. We would design an activity in which we would ask them to write a tweet in response to each of the concerns covered by our questionnaire. They would then hang these tweets on a 'Tweet Tree' for collection. This idea was rejected for three main reasons. First Twitter is a technology that can polarize people, dividing those who love it and those who do not. It is also a relatively new technology and we were concerned

that it may not necessarily be familiar to all our participants. Thirdly writing tweets on paper so that they could be hung on a 'Tweet Tree' would mean removing the message, the idea of a tweet from its normal digital medium or domain.

Further thought led us to the idea of postcards. These similarly restrict the amount of text that can be entered but are natively paper-based and are a technology that should be familiar to all. They are also individual artifacts and flexible enough to give participants the opportunity to be creative in their responses. Finally, they immediately suggested a playful means of collection and so we also made a small red postbox for participants to use to 'send' their postcards.

We now had to decide on the best way to elicit the types of responses that would be helpful in our evaluation. This meant something more open ended than simply repeating the questions from our earlier questionnaire. At the same time, in addition to collecting evaluation responses, we were hoping that the activity we planned to design around the postcards would help to reinforce any insights gained exploring the visualization. In discussing how we could achieve this, reflective learning techniques seemed an appropriate source of inspiration. We therefore decided that each participant would be given three separate postcards, each with a different reflection prompt to respond to. These prompts we derived from the questions used in our earlier questionnaire.

Reflection Prompt 1

The first reflection prompt addressed our concerns regarding engagement and collaboration. It performs a similar function to question statements 1 and 3 in the questionnaire.

"Please reflect on your involvement in the previous two activities. Write a few sentences thinking in particular about how engaged you were, how absorbed or distracted, and how easily you feel you worked with other members of your team. Try to think about the extent to which the technology helped or hindered you in this regard."

Reflection Prompt 2

The second reflection prompt addressed our concerns regarding the generation and exploration of alternative ideas, and the ease with which participants could utilize their knowledge and experience. It performs a similar function to question statements 2, 4 and 7 in the questionnaire.

"Please reflect on how you used the data visualization to first create your household and then to devise competition answers. Write a few sentences, thinking in particular about how easily you were able to explore possible options and come up with different ideas. Did you use your prior knowledge as well as the information shown? And how easy you found it to relate that prior knowledge to the data?"

Reflection Prompt 3

The third reflection prompt addressed our concerns regarding participants' ability to gain an overview of the data and also to identify relationships and patterns within the data. It performs a similar function to question statements 5 and 6 in the questionnaire.

"Please reflect on your understanding of the information contained in the data visualization. Write a few sentences, thinking in particular about how easily you managed to gain an overview of what was represented. Also think about how quickly you grasped what the information meant, did you spot clear patterns and relationships or did you find it confusing? Did it prompt you to think of ideas you had not previously considered?"

EXAMPLE RESPONSES TO REFLECTIVE POSTCARDS

Participants responded to the postcards and appear to have taken the time and effort to provide considered responses, something that may not always seem to be the case with questionnaires. We have listed a couple of responses to each of the postcards as examples below.

Reflective Postcard #1

"It was easy to work with the group, we were open to each others opinions. Technology was useful for us to investigate our views and to help discussion. The display of the information was interpreted differently by others but this helped with discussion."

"I felt engaged and absorbed with the tasks and comfortable working with the other members. Some of the information in task 1 was a little overwhelming. The technology was very useful."

Reflective Postcard #2

"The iPad data visualisation was very useful as it made it surprisingly easy to look at each piece of data and also caused the data to be better laid out. I could also use it with my own knowledge which I had to do for the first task."

"Did use prior knowledge and so did other team members. Needed to focus back on house and empathise what they were like. iPad data didn't really contribute to ideas."

Reflective Postcard #3

"Definitely. You had a broad overview and you could drill down to get clearer answers. This interactivity flowed very well and really demonstrated well how this family behaved."

"It was easy to get an overview about each group of data due to how it was laid out and that made it very easy to compare the data and come to assumptions about it."

ANALYSIS OF REFLECTIVE POSTCARDS

Our analysis of the content of the thirteen participants' reflective postcards indicate that postcard #1 and postcard #3 successfully elicited responses relevant to the concerns we were seeking to address. Postcard #2 was less successful. Whilst almost all participants' responses discussed their ability to use insights gained exploring the

visualization to build on their existing knowledge, very few discussed idea generation or how well they were able to explore ideas. Analysis of the reflective postcards is shown in Table 1.

Evaluation Factor (Q = Questionnaire, P = Postcard)	Positive Responses	Negative Responses
Engagement (Q1, P1)	13	0
Collaboration (Q3, P1)	12	0
Generating Ideas (Q2, P2)	0	1
Exploring Options (Q4, P2)	1	1
Building on Existing Knowledge (Q7, P2)	7	0
Patterns & Relationships (Q5, P3)	10	2
Overview (Q6, P3)	8	1

Table 1: Analysis of Responses on Reflective Postcards

DISCUSSION

The responses to postcards #1 and #3 seem to suggest that this can be an effective approach to collecting questionnaire type information more creatively during co-design workshops. Postcard #2 suggests we need to refine the technique further and explore its limitations. We think that the reason participants did not specifically address the question of idea generation may have been because the activities undertaken with the visualization were not obviously ones requiring divergent thinking and rapid idea generation as primary tasks but were more exploratory and involved creating a narrative picture. Quite why the question of exploring options was not addressed is more problematic. This seems to be addressing a core part of the activities which involved creating a descriptive collage of the type of household participants thought could be represented by a visualization of energy consumption data, and then selecting five ways in which their imagined household could be smarter in their use of energy in order to complete a competition entry. However, perhaps we were addressing too many individual concerns in this prompt, as it was replacing three questionnaire questions rather than two as the other prompts had done. Or perhaps it was simply that our prompt was poorly written and did not explain what we wanted, although to us it does not seem materially different from the others.

The type of evaluation method described here plays a small but significant role in our overall evaluation plans. Here we are investigating how participants feel they are being supported in their role as a creative person whilst using interactive visualizations during co-design workshops. However it is important that this is achieved using methods that are an integral part of a workshop and that are sensitive to its overall aims and atmosphere. Complementary

evaluation techniques we use aim to investigate the effect that exploring interactive visualizations have on the creative processes taking place in co-design workshops and how the impact of insights gained during activities in which visualizations are explored can be traced through the design process to the eventual design prototypes. These are techniques we are only beginning to develop and yet, if our design approach is to gain acceptance within wider practice it is incumbent on us to demonstrate how such insights can inspire design ideas that are different in kind but of equal creativity as those inspired using other methods. How we design our evaluation methods is therefore an increasingly important aspect of our research. The evaluation of workshop techniques has to date not been widely discussed in the design literature, but as participatory co-creation becomes more widely used it is something that must surely be addressed. We hope that through our research and by contributing to workshops such as this we will be able to make some level of contribution to developments in this area

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