

# Creativity Greenhouse – Communication Technologies in the Facilitation of Cross-disciplinary Research Ideas

Holger Schnädelbach\*, Xu Sun\*\*, James Norris\*, Paula Duxbury\*\*\*, Richard Bailey\*\*\*, Dave Lloyd\*

\*Mixed Reality Lab

\*\*Horizon Digital Economy Hub

University of Nottingham

Nottingham NG81BB, UK

\*\*\*Transformative Research & Creative Strategy

\*\*\*\*RCUK Digital Economy Theme

EPSRC

Swindon SN21ET, UK

## ABSTRACT

The EPSRC employs a variety of mechanisms to award funding, among them those that incorporate the targeted facilitation of group creativity. The latter involves people being co-located for a period of time and such events are highly intensive and competitive. They are also very costly, and they demand the commitment of a block of time, which makes them un-attractive for particular groups of individuals, for examples those with family commitments. This paper reports on work conducted in a collaboration between the HORIZON DEH and EPSRC to investigate the feasibility of conducting facilitated creativity events when participants are distributed. We present the first two stages of an iterative development and evaluation process that aims to select the most suitable communication technologies and to derive the most appropriate facilitation process for the task. Initial results indicate that facilitated group creativity can indeed be supported in this context, while the technology still provides significant challenges in practice.

## General Terms

Human Factors

## Keywords

Creativity, Groups, Facilitation, Collaboration Technologies

## 1. INTRODUCTION

The EPSRC aims to be truly innovative in the processes used to stimulate creativity and potentially transformative research and as such runs a range of activities where targeted facilitation of creativity is employed, from ‘Think Free Retreats’ to five-day funding ‘Sandpit’ events. At the first EPSRC Think Free Retreat in June 2009, the attendees developed the concept of the ‘Creativity Greenhouse’ - using digital technologies to facilitate the commissioning and development of cross-disciplinary research ideas. Could facilitated creativity activities be conducted with participants remote to each other, supported by digital communication technologies?

The currently employed co-located events, the relatively common funding sandpit might serve as an example, are highly intensive. Sandpits are five-day events, with participants brought together in a venue to compete for funding resources with a dedicated team of facilitators guiding the event. The process involves a stage of pushing participants to develop research ideas beyond what they already knew they wanted to do, a result of them always being set up to be cross-disciplinary. They require participants to commit a

substantial amount of time away from ‘home’, which can be unattractive for people with family commitments.

The use of communication technologies in this context has the potential to enable such events across physical and/or time constraints. Their use could also enhance the pool of people involved in contributing to meetings and generating ideas and it could support more efficient and cost-effective ways of working, e.g. result in significant savings on meeting costs.

Remote Collaboration technologies (Audio, Video, Shared Digital Resources) have of course been at the heart of CSCW research for a considerable time, exploring different application areas. Work with video conferencing for focussed meeting support has been followed with that on Media Spaces, supporting always-on collaboration [1, 2], with the study of 3D collaborative technologies providing a particular angle on this field [3]. Currently, support for distributed collaboration is both supported through high-end technologies [4] and through freely available tools, such as Skype, SecondLife and GoogleApps. Arguably, it is those technologies that have made distributed collaboration widely accepted for a number of different purposes and practical for everyday use. Although distributed collaboration has been extensively studied in a variety of contexts [5], to the best of our knowledge, no work has been reported on the use of such technologies for the support of facilitated creativity in a funding context.

## 2. PREPARATORY TRIAL

EPSRC began to investigate whether group creativity could be supported with participants remote to each other in 2009 and approached the Horizon Digital Economy Hub for support in March 2010 with the stated aim to conduct the resulting research ‘in-the-wild’. This resulted in a preparatory trial towards the end of 2010 with the following two objectives: Objective 1 was concerned with investigating which collaboration tools are most suitable in this context. Objective 2 was concerned with understanding the best way to structure such remote events.

In collaboration with EPSRC, Horizon developed a focussed event and trial structure to be able to test two technology combinations in a pseudo-realistic formative study. Those combinations were chosen after a detailed review of available system and they were chosen to support both synchronous and asynchronous collaboration. This was aimed at supporting the process of facilitation through event directors and mentors as well as the off-line collaboration of participants when it suited them. Both technology combinations used Google Apps as the backbone for data storage and exchange, which was combined with either Adobe Connect Pro (multi-party web video conferencing) or Teleplace (collaborative virtual environment and audio conferencing) as the synchronous communication tools.

The study involved a technical moderator, a session moderator and a study observer, who took two teams of 4 participants each through 5 sessions of activities. These sessions were developed to closely resemble activities (including facilitated creativity) typically found in co-located funding sandpits. Qualitative and quantitative data was collected through surveys, focus groups as well as in-session observations.

Both technology combinations presented significant technological challenges but also supported the activities well within what they offered interactionally. Very generally, Adobe Connect offered tighter control to moderators, allowing them to group and re-group participants. Teleplace offered participants more freedom and structurally provided a closer resemblance to co-located funding sandpits. GoogleApps served as a highly useful backbone for the distribution of shared documents, funding pitches and evaluation surveys.

Beyond technology, the session structure broadly worked from both participant and moderator points of view. The outputs generated by participant were in line with what one would expect considering the chosen event format for the trial. The formative study also resulted in a set of materials, derived from the material originally provided by EPSRC, outlining a first version of the Creativity Greenhouse event structure and associated resources.

### 3. CREATIVITY GREENHOUSE

This early promise then lead to a formalisation of the collaboration in the project ‘Creativity Greenhouse – Supporting Distributed Group Creativity’ (EP/J006688/1), currently in progress, aiming to explore the concept through the distribution of real funding resources in two stages. Phase 1 involved the distribution of resources within the Horizon Digital Economy Hub and served as further opportunity to pilot the technology and the process. It involved the comparison between a co-located and a distributed event, both following very similar event structures. Phase 1 has been concluded in July 2011 and very much initial results are reported in this paper. Phase 2 will involve funding distribution to the broader UK research community as relevant to two of the four priority areas of the RCUK Digital Economy programme and EPSRC ICT programme.

Based on the marginally higher participant preference for Teleplace (over Adobe Connect Pro) and its better support for matching the structure of co-located funding sandpits, it was chosen alongside GoogleApps to serve as collaboration platform. A new event structure for the comparison was directly inspired by the pre-trial resources already produced.

#### 3.1 Method

A comparative study was designed to investigate the difference in user experience between two funding events in real and virtual environments. Each event was structured to be a 2-day event which required participants to develop collaborative research ideas to compete for funding. The first event was conducted while participants were co-located (14 participants). Participants in the second event (10 participants) joined remotely from their own office, using the aforementioned technology platform. The procedure for both events was consistent and included phases of meeting other participants, generating research ideas, and collaborating with other people to develop and present a research proposal.

Previous work [5, 6] highlighted the importance of integrating qualitative and quantitative approaches in evaluating complex collaboration in groups. In this study, we applied a multiplicity of

user-centred methods including naturalistic observation, surveys, and focus groups to investigate user experience, focussing on individual experience, social interaction and event performance (i.e. the results in terms of ideas generated and funding distributed).

#### 3.2 Early results

The evaluation of the comparative formative study is ongoing and what can be reported here are only indicative pointers. Very broadly speaking, when considering merely the quantitative data collected, the co-located and distributed events performed in a similar fashion with regards to reported individual experience, social interaction and project outcomes. This is despite us experiencing significant technical and usability problems with the Teleplace collaborative virtual environment, which were somewhat masked by very active and supporting orchestration work by technical and event facilitators. These problems negatively impacted the level of awareness of others, the sense of co-presence, turn-taking and the interaction with resources. However, one participant described the technology empowering, allowing them to speak up more because of the increased ‘distance to proceedings’, highlighting the future potential of such technologies. Despite the above problems, the results (in the sense of ideas generated) were on par with the co-located event, according to the panel of proposal judges.

### 4. FUTURE WORK AND CONCLUSION

The work do date as reported here provides a clear indication that the support of facilitated group creativity can be well supported through digital communication technologies and that the outcomes of the process might well be comparable to events where participants are co-located, with the caveat that our current data was collected only within the setting of the HORIZON DEH. Only ever more realistic trials across a larger group of participants (which will be conducted during Phase 2) will provide the necessary additional information to firm up the initial evaluation. However, beyond choices of technology platform and resulting technical and usability issues with that platform, the project has already delivered an iteratively refined process on how to conduct distributed events in support of the facilitation of group creativity valuable for the continuation of this project and beyond.

### 5. ACKNOWLEDGMENTS

This work was supported by the Engineering and Physical Sciences Research Council [EP/J006688/1].

### 6. REFERENCES

1. Gaver, W.W. The Affordances of Media Spaces for Collaboration. in CSCW. 1992. Toronto, Canada: ACM Press.
2. Fish, R.S., et al., Video as a Technology for Informal Communication, in Communications of the ACM. 1993. p. 48-61.
3. Schnädelbach, H., et al. Moving Office: Inhabiting a Dynamic Building. in CSCW. 2006. Banff, Canada: ACM Press.
4. O'hara, K., J. Kjeldskov, and J. Paay, Blended interaction spaces for distributed team collaboration. ACM Trans. Comput.-Hum. Interact. 18(1): p. 1-28.
5. Neale, D.C., J.M. Carroll, and M.B. Rosson, Evaluating computer-supported cooperative work: models and frameworks, in Proceedings of the 2004 ACM conference on Computer supported cooperative work. 2004, ACM: Chicago, Illinois, USA.
6. Heldal, I., A. Steed, and R. Schroeder, Evaluating Collaboration in Distributed Virtual Environments for a Puzzle-solving Task, in HCI International. 2005: Las Vegas, USA.