
Conversational spaces for learning and designing

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Abstract

In this paper we describe a project to trial and evaluate 'information spaces' in which learners are more freely able to engage in the kinds of conversations that are beneficial to the practice of design and its education.

Keywords

Design, Learning, Tabletop interaction, Face-to-face interaction, Conversation

ACM Classification Keywords

H5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

General Terms

Design, Learning, Tabletop interaction, Face-to-face interaction, Conversation

Introduction

In this paper we report on a project to configure and evaluate novel 'information spaces' to support students learning design through face-to-face conversation in a co-located, small group setting. The 'crit' is a widely used tool in design education, and allows students to receive feedback and critique on their ongoing work and is an example of learning through conversation (e.g. see the work of Diana Laurillard and others).

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A common problem with an approach that relies heavily on interaction is a lack of engagement by learners in the conversation. One reason for this is when available technology either fails to support, or actively stifles, productive conversation by creating distractions or additional cognitive demands.

In this note we report explorations of the design of 'information spaces' – clusters of technology embedded in physical spaces configured so as to remove some of these barriers and better support a face-to-face conversational style of learning. A guiding principle has been to make the technology as seamless and unobtrusive as possible. In practice, this has meant deploying what seem 'low-tech' and simple solutions, rather than using cutting edge technologies.

Context

The focus for the study was to intervene in the support for postgraduate classes in Interaction Design, being studied by a small group of students from varied backgrounds. Students worked autonomously on individual, self-defined projects, and reported progress peers and tutors in a regular 'crit' session.

From presenting to discussion

In a crit, each student gives an account of progress, and receives critical feedback from peers and tutors. Such sessions work best when a student's report provokes a lively interaction within the group, with an exchange of ideas, reframing of problems, restructuring of design knowledge, and co-construction of a new understanding of the design project that moves the student and their project forward. Report-backs often take on the air of formal presentations, where one person delivers to the others, with time for comments

or questions afterwards. However, a more conversational encounter, where several participants are able to contribute, may offer more to the collaborative learner.

Table as a focus

An early intervention highlighted the value of tabletop interactions, and suggested ways of further exploiting the potential of the table as a site for action, collaboration, and learning. Initially, students chose conventional forms of presentation (e.g. using Powerpoint) when reporting on their work. An initial modification to practice was to use a downward pointing projector, making the table into a large display surface, and the effect of this change was immediate and striking.

From a situation where single presenter performed for a largely passive audience, we moved to one where group members engaged more directly with the presented materials (**figure 1**). Standing up provided a



figure 1: Engagement around the table

better view of the table and projected image; reaching into a presentation to point and comment became natural for all members; writing on the table surface provided a convenient way of annotating the presentation, raising new ideas, and so on. With the table projection, more members made more contributions, and the nature of the activity shifted from a one-to-many presentation, to a multi-party conversation around a collection of props including presentation slides, notes, sketches and other artefacts.

Requirements

Some key requirements for encouraging and supporting conversation were found to be:

- Open access –technology should be easily accessible, for instance without complex login or setup procedures being required before use.
- Shared spaces - technology should create a shared experience, rather than taking individuals into private spaces (e.g. by allowing prolonged 'head-down' use of a traditional computer).
- Lose nothing – familiar interactions, including sketching and writing, with physical as well as digital artefacts should be supported.

Elements of an information space

At the core of the information space being trialed here is the idea of design conversation taking place around a table. The table can be the focus for many activities: showing digital or physical artefacts; recording and documenting emergent themes and ideas through writing, drawing and other actions that supplement the conversation; editing, augmenting, or adding to

emerging design ideas. Central elements of the prototype information space to support these activities are:

- Projection and display: allowing learners to bring digital materials (e.g. slides, video, photographs, software and so on) to the physical conversation space, alongside physical objects (documents, devices, physical prototypes, and so on)
- Interaction: learners must be able to control presentations and any other facilities of the information space. it is desirable for the locus of control to be shared or easily moveable between people.
- Capture, replay and reflection: capturing key points for later review and reflection is clearly important. Traditional note-taking is cognitively demanding and removes the note-taker from the conversation, so support should be provided for capturing the content of a session and making it available for later review.



figure 2: Writeable table surface

Physical setup

The group of students and tutors work at a large table, whose surface is a standard whiteboard and are encouraged to write on this surface to take notes, express ideas, and so on as a session progresses. As shown in **figure 2**, during a session, not only are notes and annotations made on the table surface, but a range of other physical artefacts are recruited as



conversational props.

The table is also used as a display surface (**figure 3**) onto which one or more ceiling-mounted projectors can project. A final hardware element is a webcam, also mounted on the ceiling, used to record all sessions for later review and reflection by the students concerned (**figure 4**).

Reflection and conversation at a distance

Central to making useful video recordings of crit sessions is embedding the recording in an

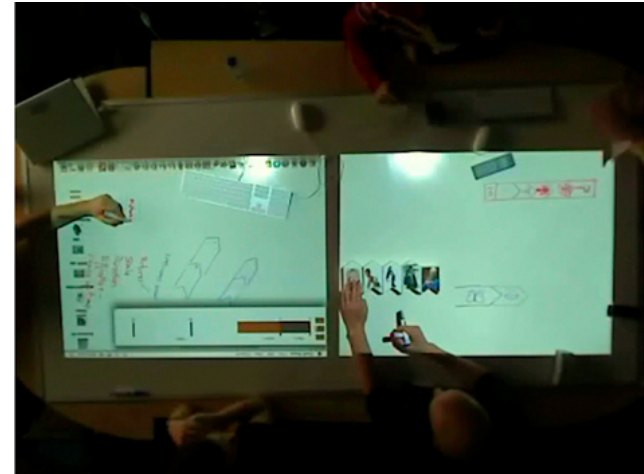


figure 4: Image from podcast of a crit session

infrastructure for allowing videos to be captured easily, and seamlessly made available to students after (or during) the session. Apple's Podcast Producer system was used to capture video podcasts and automatically post them as entries on blogs. Students are encouraged to make use of their personal blog outside of the sessions, to record reflections, post ideas, and assemble media that may come in useful later on in the project.

Findings and themes

An early and informal analysis of the crit sessions yielded a number of interesting themes.

From presentation to conversation

The move to a table-focused space for presentation and action engendered a significant change in the way that participants orient towards one another, and towards the materials being presented. Presentations became

less a transfer of information from a speaker to an audience, and much more and opportunity for conversation around the slides and other materials the 'presenter' had brought to the table.

Territoriality and 'public' and 'personal' space

Researchers (e.g. [1]) have noted people are adept at segmenting the space around them so as to coordinate their activities with those of others. Distinctions are made between 'public' areas, where anybody can manipulate objects, and 'private' or 'personal' areas whose contents are treated as being owned and manipulated by only one individual.

A similar distinction was observed in interactions around the table, with areas close to an individual, being reserved for more personal note taking that could form the basis of a later conversational turn or action in a more central, public space.

Structuring conversations

An early high-level analysis of the video data collected showed that while crit and review sessions are highly varied and may unfold in quite different ways depending on the individuals present and the maturity of the project work, there tend to be three common elements: reporting and reviewing progress; engaging in discussion; setting targets or agreeing objectives.

The functions of writing

Writing and annotating in personal and shared space was found to have several functions, including: a temporary memory that would trigger later questions

or interjections; notes for later reflection, made in the knowledge that a permanent video recording would be made; making links and connections between items already written by self and others.

Challenges

The goal of configuring learning spaces that smoothly allow learners to draw on an appropriate range of materials to progress their design work and their design skills through conversational interactions present many technical challenges. However, a more significant set of challenges remains in the area of evaluation. The analysis conducted so far has begun to yield a qualitative understanding of some of the effects of technology change. However new methods and conceptual tools that go beyond those of traditional HCI will be needed to further our understanding of the relation between technology and conversation, and the educational value of the kinds of conversation produced.

Acknowledgements

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References

[1] Scott, S.D., Carpendale, S., Inkpen, K.M. Territoriality in collaborative tabletop workspaces. Proc. CSCW 2004.