

Contrasting the use of tools for presentation and critique: Some cases from architectural education

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Abstract This study investigates video recordings of design reviews in architectural education, focusing on how presentations and discussions of designs are contingent on the specific tools employed. In the analyzed recordings, three different setups are utilized: traditional posters, digital slide-show technologies, and combinations of the two. This range of different setups provides a set of contrasts that make visible the role of technologies in shaping the ways in which the reviews are conducted. The analysis is structured in three themes. First, we examine the sequential organization of digital presentations in relation to the spatial structure of poster-based presentations. Second, the different ways in which shared attention is established in digital, paper-based, and hybrid presentation practices are analyzed. Third, we address part-whole relations—how details in presented materials are put in relation to the overarching project or the presentation as a whole. Taken together, the analyses suggest that the detailed organization of the design review is transformed in subtle yet consequential ways through the introduction of digital slide-show technologies. These transformations are consequential not only locally, for the design review itself, but also for the instructive work that is accomplished through this practice. We conclude by discussing some implications for design, arguing that an increased awareness of how the practice is influenced by the different setups might be key for the proper adaptation of presentation technologies to particular purposes.

Keywords Architectural education · Design reviews · Ethnomethodology · Video analysis · Presentation practice and technology

Introduction

Architects design buildings, but the products of their work are not in the first instance buildings, but rather design proposals, which need to be communicated and then realized through the coordinated work practices of numerous other actors. This implies that

presentations of proposals are pivotal to the work that eventually culminates in a built environment. Presentations have strong persuasive and rhetorical elements; in order to convince an audience that a particular design proposal is the best solution, the merits of the project are highlighted. Presentation practice also has an instructive character; the communication of a proposal to an audience of different professionals needs to be instrumental in providing a shared understanding of the project, sufficient for subsequent collaborative work. Technologies mediating presentations in architecture must, thus, be geared not only toward the rhetoric of presentation, but also to the requirements of ensuing discussion and assessment.

While presentations of design proposals are important to the work of architects, they also constitute a central part of standard design studio pedagogy. This study analyzes practices of presentation, discussion, and assessment in so called *design reviews* in architectural education. In these sessions, students present their finished projects and receive feedback from an audience of professors, peers, and external architects. In some respects, the centrality of presentation practice for professional architects is mirrored in the design review – one of the aims of this practice is to prepare students for the presentations that will form part of their working lives. In other respects, the design review is very different from presentations made by professional architects; most importantly, the proposals are not to be turned into built environments. Instead, the design review could be considered a central activity for the articulation, teaching, and learning of architectural competencies. It is a site where issues of *professional vision* (Goodwin 1994) are explicitly at stake and negotiated, and thereby an important part of the *practicum* (Schön 1987) of architectural education – the institutionally organized ways in which students come into contact with the discourses and practices of the discipline (Ivarsson et al. 2009; Lymer 2009). Exploring how these practices are mediated by various technologies is, therefore, an important issue in understanding architectural education. The results should also be relevant beyond architecture, as design reviews are employed in many, if not most, design disciplines (e.g., Mitchell 1996; Phillabaum 2005). Furthermore, within CSCL, design studio work and critique has been used as a pedagogical model for educational practices outside of the field of design (e.g., Jurow et al. 2008; Shaffer 2002; Stevens 2002).

Both in professional and educational practice, the introduction of digital slide show technologies restructures the ways in which presentations of design proposals are done and consequently how these presentations are understood (Stark and Paravel 2008). By analyzing video recordings of design reviews in a Swedish school of architecture, this study investigates how presentations and discussions of designs are contingent on the specific tools employed. The university at which the empirical work of this study was conducted is currently experiencing a shift in the use of presentation technology – from poster based presentations to the use of projectors and screens for presenting digital slideshows. This results in different design review setups coexisting at the school. In order to explicate how different presentation setups are involved in shaping the design review events, we adopt an analytical and methodological approach informed by ethnomethodological studies of work (e.g., Button and Sharrock 2009; Heath et al. 2000). The aim is to unpack the interactional constitution of design reviews and their dependence on the material and spatial setup. Because the use of presentation technologies is ubiquitous in schools and universities – and because design tasks and design reviews are part of educational practices outside architecture education – the study can serve the purpose of a telling case for presentation practices in education more generally. In addition, the close parallels between educational design reviews and professional architectural presentations suggest that the results should be relevant also outside of educational contexts.

Technology, presentation practice, and critique

In research on digital slide show technologies, the most common concern is the benefits or possible pitfalls of digital as compared to traditional presentation technologies (Adams 2006; Kjeldsen 2006; Tufte 2003; Vallance and Towndrow 2007). In a critique of digital slideshow technologies, for instance, Tufte (2003) argues that the “cognitive style of powerpoint” constrains and impoverishes the information communicated by the presentation. According to Tufte, the use of such technologies results in a reduced complexity combined with a tendency of “information overload”; the information gets simplified through the constraints of the conventional bullet list structure at the same time as too much information is fitted into each slide. As these issues primarily concern the formulation of written text in the form of bullet points and because the architectural presentations rather concern the presentation of plans and sketches this common critique might not be equally applicable to the activity investigated in this study.

From our point of view, it is also hard to draw any conclusions based solely on the structure of the software and the information presented on the slides. By not focusing on the actual presentation event, Tufte’s analyses miss how the presenter commonly circumvents the ways in which the software structures and limits the information. This is an issue brought up by Knoblauch (2008), who suggests the *performance* as a more informative unit of analysis than the digital document itself. Through an analysis of a set of presentation events, he shows how presenters make creative use of pointing gestures, with hands and/or laser pointers, in order to elaborate the surface of the projected document. Such performances aided by digital slideshow technologies are found to have a number of potentially useful affordances compared to unaided ones; among other things, the technology provides something material to point to and ground the talk in. Similarly noting the importance of focusing on the presentation event rather than the digital document itself, Stark and Paravel (2008) describe what they call the morphology of presentation. The study focuses on two public performances that make use of PowerPoint like technologies: Colin Powell’s presentation for the United Nations of evidence for the existence of weapons of mass destruction in Iraq; and the presentations made by a set of architectural teams in the design competition for the redevelopment of the World Trade Center in New York. Noting the differences between working with paper notepads and digital slideshow technologies, the researchers argue that the possibility of combining different media makes for increased affordances for the construction of rhetorically effective presentations.

The mentioned studies focus exclusively on how technologies shape the presentation. A major aim of the present study is to expand on previous work by providing a stronger focus on the ways in which presentation technologies influence not only the presentation but also the ensuing *discussions, negotiations, and assessments*. While in some settings rhetorical effectiveness might be the primary measure of a successful presentation, the design review is done in order to enable particular forms of learning and instruction. Consequently, the detailed character and relevance of *feedback* must be considered of central significance. That is, design reviews require the unpacking of the design in such a way that it becomes available for reasoned architectural argument. The practice has to establish a kind of material, public, and indexical ground (e.g., Cakir and Stahl 2009; Hanks 1992; Zemel et al. 2008) verbally elaborated representations in relation to which participants can accomplish the fundamentally embodied and responsive work of critique (cf. LeBaron 1998; Lymer 2009). The focus on the ensuing discussion in this setting also implies that additional demands are placed on presentation technologies. In particular, these technologies must allow for easy access to the presented materials after the presentation is finished and the

critique ensues. In fact, the whole presentation phase must be designed as instrumental for enabling the ensuing discussion.

In relation to this interest, some work on the collaborative use of shared displays becomes relevant. Crabtree et al. (2003), for instance, study the use of displays in domestic environments. By taking “display” as a verb rather than a noun, they focus on the act of communicating something by way of visually represented information. When applied to the architectural design reviews, displaying becomes an issue of how participants verbally and gesture wise elaborate two dimensional surfaces displays in Crabtree et al.’s usage to convey architectural ideas. As extensively discussed in relation to the empirical material below, such acts of displaying are contingent on the presentation setup employed.

A body of work done on media spaces highlights and seeks to alleviate problems with shared reference and awareness, caused by the distribution of participants (Baecker et al. 2008; Gaver 1992). Luff et al. (2006) provide a detailed study of an experimental system supporting collaborative distributed work over paper documents. The study highlights the central role of gesture; in order for participants to achieve a shared sense of their collaborative work, it is absolutely critical that they are provided with resources for establishing mutual alignment to the concrete material objects around which their work is organized (also see Gutwin and Penner 2002; Kuzuoka et al. 2004). The reported studies of media spaces deal with issues raised by the *remoteness* of participants with regards to mutual alignment to concrete objects. Shared reference, however, is not only an issue for remote interaction. Colocated actors too must address the establishment of shared reference in interaction (cf. Hindmarsh and Heath 2000). In an activity such as the design review, the spatial organization of the event, how participants are aligned toward the discussed materials, and the technologies used to show those materials, have a profound impact on the ways in which a shared sense of the critique is achieved.

Methods and analytical approach

The study part of a larger project investigating learning, interaction, and the use of technology in architectural education (see Ivarsson et al. 2009; Lindwall et al. 2008; Lymer 2009) is based on approximately 70 hours of video recordings of architectural design reviews, in total 143 sessions varying in length from 15 minutes up to one hour. Focusing on how “tools and technologies feature in work and interaction in organizational environments” (Heath and Luff 2000, p. 4), the analysis builds on the consideration that “in order to produce and to interpret recognizable accountable actions, co participants orient to the details constituting the local order of talk and action and mutually display their orientations in their conduct” (Mondada 2006, p. 118). To textually represent these details which, among other things, consist of complexes of gestures and talk we adopt a simplified version of the conventional conversation analytic format for presenting extracts from talk (Jefferson 1984), accompanied with images used to convey the embodied conduct of participants. The analyses of the video recorded material have been conducted collaboratively through repeated viewings and discussions. Relevant analytic observations have been organized into themes, and for the presentation, a number of episodes have been selected to illustrate the themes and observations. The episodes displayed in Excerpts 1, 2, and 3 have been translated from Swedish; the remaining episodes were drawn from sessions that, due to the international composition of the student group, were carried out in English.

Analysis

In their original form at the 19th century *École des Beaux Arts* in Paris design reviews were done as closed assessments with only jurors present (Anthony 1987). Today, design reviews are commonly conducted in interaction with students, and with other peers present as audience. At the school of architecture investigated, the review consists of two distinguishable phases. First, the students present their proposal. This usually takes 5 to 10 minutes. Then, the discussion phase starts, in which critics comment on the students' design and presentation. Generally, this review is considered to work both as an assessment of the presented work, and as a learning opportunity for the participating students, including the audience (Wilkin 2000). During the entire five year program, students go through approximately 15 critiques of their own work. Considering that students also participate in their peers' review sessions, this practice becomes a central and recurring component of the program; in total, each student participates, with varying degrees of engagement, in 150-200 sessions.

As noted in the introduction, the review sessions at the school of architecture investigated are in a process of change. This yields a variation concerning the ways of organizing the review, technologically and spatially. Three main types of review setups can be distinguished. We illustrate these setups with schematic sketches (Figs. 1, 2, and 3). Note that, in these sketches, only one student and one critic are drawn. Empty chairs represent further participants, and show how these are spatially oriented in the different setups.

In the traditional poster based setup (see Fig. 1), students are pinning up their proposals in the form of posters on screens, with several students' proposals hung side by side. This is usually done in a central atrium, with several reviews going on simultaneously, and each group moving from one proposal to the next during the course of the day.

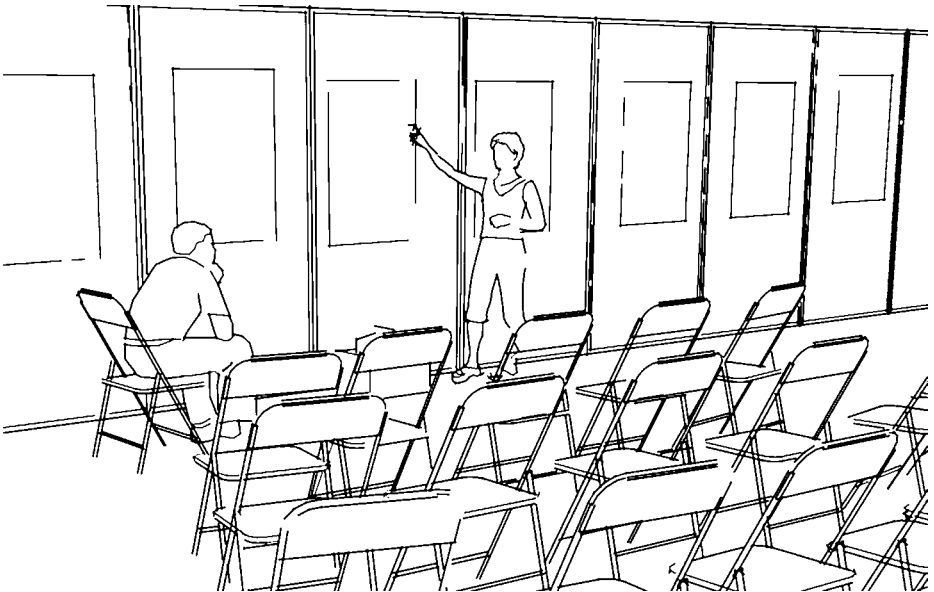


Fig. 1 The poster-based setup

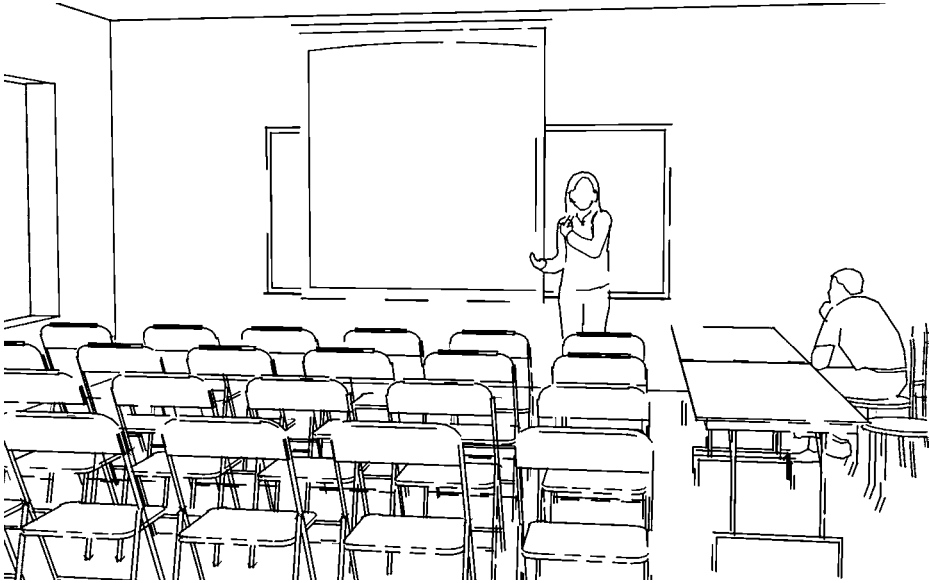


Fig. 2 The projector and screen setup

The projector and screen setup (see Fig. 2) involves students going through a prepared sequence of slides during the presentation, sometimes complemented by models of parts of the proposal. These sessions typically take place in traditional lecture rooms, with peers positioned as students in a class, and critics positioned behind a desk on one side of the room.

The hybrid setup (see Fig. 3) involves a combination of posters and projector screen technologies. Students and critics shift between attending to the screen and the posters. In



Fig. 3 The hybrid setup

the observed cases, these sessions have been done in a corridor adjoining the atrium, with the same basic spatial configuration as the poster based setup. Proposals are pinned up side by side, and the group repositions itself, and the projector screen setup, for each new session.

In the following, a set of analyses of presentation and discussion practices during design reviews are organized in three interrelated themes. First, we discuss the sequential organization of digital presentations in relation to the spatial structure of poster based presentations. Second, the different ways in which shared attention is established in digital, paper based, and hybrid presentation practices are analyzed. Third, we address the part whole relation how details in presented materials are put in relation to the context of the whole presentation.

Presenting and discussing designs: Elaborations of posters versus slide by slide disclosures

Like all talk, a presentation is by its very nature a sequenced activity one thing must be said first and another second. Unlike most communicative situations, however, presentations are commonly done without interruption. Save for clarification questions, students are allowed and expected to present their proposal as a coherent chunk of information. This makes the sequential organization of presentations different from that of ordinary conversations. It is commonly hard to prepare for a conversation, because what one can say is contingent on the conditional relevancies set up by the actions of other participants in the interaction. In contrast, the format of a presentation provides opportunities to plan what is to be said first and what comes second.

When using digital slideshow technologies, the students are required to prepare a sequential structure, which in the course of the presentation is unpacked slide by slide. Compared to the presentations done with the projector and screen setup, the poster based presentations have more of a sequential openness. Even though the pinned up posters themselves can be read as telling a story about the project through the included texts and images the presentation event does not have to adhere to any predefined order of unpacking this information. The presenter can move freely between different parts of the posters. Sometimes, the students seemingly produce the structure of their talk on the spot. As the students are expected to present their proposals as a coherent and well planned chunk of information, however, they commonly use manuscripts to circumscribe the openness of the poster based presentations. By bringing a prescribed sequential structure to the scene, these students resolve the tension between the sequential openness of the medium, and the expectation that they are to deliver a relevant, comprehensible, and well timed talk.

Although the ordered structure of the digital slideshow provides a useful resource in the presentation, this structure might be of hindrance in the subsequent discussion. It is the student who has decided on the sequential order of the slideshow, whereas the order of the ensuing discussion is typically initiated and controlled by the critics. In the poster based setup, all relevant visual information is persistently present in plain view. In the projector screen setup, in contrast, only a subset of the proposal is conventionally shown at a time. Although one could conceivably design a single slide presenting roughly the same content as the typical poster, the resolution of the projectors places serious limitations on how much detail can be included. The critics thus navigate through the sequence of slides, at times by relying on the presenting student to perform the adequate actions. When this happens,

navigation can itself turn into an activity that becomes foregrounded, which, in turn, could influence the topical continuity of the talk.

EXCERPT 1

101 Hans: and then perhaps in the plan you don't really see the
102 relation to the campus, that I would have wanted,
103 where we have seen many other more direct, structural
104 relations to campus [I don't know that big,
105 Tim: [yeah I think eh that=
106 Hans: =that big shop-window. to where's it turned now (.)
107 that you had, ((Tim picks up the remote and starts
108 stepping through the presentation)) it almost looks
109 a bit too much like our university building maybe
110 (.) eh that big shop-window to the world (1.0) ((Tim
111 halts)) e::h there for example what- what- yeah
112 that's right we see that, so it's that northward
113 turning window that Sarah commented on,

Having just commended a student for the overall qualities of his project, the critic Hans begins to formulate a problematic aspect of one of the main buildings: its "relation to the campus." The student's proposal does not solve this relation in a way that the critic "would have wanted." Comparing with other projects, which are formulated as having had "more direct structural relations to campus," the critic thus sets up two interrelated contrasts—the discrepancy between the student's solution and what the critic would have preferred, and a relative lack in comparison to other students' projects. In the first lines of this brief excerpt, we catch an initial glimpse of some of the work of assessment and instruction characteristic of critique: the production of evaluations of students' proposals couched in recognizably architectural language, and mediated through the formulation of contrasts.

To specify the comment, Hans refers to "that big shop window" (line 106). This window, however, is not visible in the currently displayed slide. Hans poses a question about the orientation of the window—which has bearings on the yet not spelled out comment on the connection to the campus. By the question, he highlights that there is a lack in the visually displayed information, which makes it difficult for him to continue. Furthermore, he specifies the window as one that Tim "had" (line 107), thus referring backwards in time in the sequence of presented slides. Tim hears this as a request to find a suitable projection: He picks up the remote and starts stepping backwards in the digital document. While Tim is searching for the slide, Hans provides two specifications of the sought-for window (lines 108–110) as resources for the search. After a hearable pause, a visible inspecting of the projection, and an extended "e::h" he indicates with an emphasized "there" that the correct slide is now in view. Upon seeing the window, he also recognizes that it is the same window that Sarah, another student, had commented on previously, "that northward turning window."

Interestingly, issues of searching and remembering crop up in this excerpt. The past tense used for referring to parts of the project highlights the temporal and sequential organization of the slideshow. The fact that Hans did not see the identity between "his" window and the one that had been the focus of an earlier comment, moreover, indicates that this organization not only creates new activities of searching, but also invites a kind of dissociation between different pieces of critique during the session. While critics in all the observed setups regularly use the

past tense to refer to such things as the students' *verbal* presentations, and to previous review sessions, the projector screen setup introduces such references in relation to the presented materials of the current session. With the spatial and persistently present organization of materials characterizing the poster based setup, activities of searching and remembering in relation to the current project are rare. The pinned up posters serve as a static indexical ground for participants, most relevantly referred to in the present tense.

This excerpt illustrates an issue tied specifically to the discussion and assessment of presented materials, rather than to the presentation itself. The presentation does not need to take into account the visibility and accessibility of materials after they have been delivered, whereas the critique phase of the design review works on the presented object in a very different way. Aspects of the design are topicalized in opportunistic ways not immediately related to the logic of the authored presentation, and different parts may, therefore, be juxtaposed in order to articulate structural features of the design or the coherence of the proposal phenomena not necessarily visible or accessible in any individual slide. We will return to this issue in the last section of the results, which deals with part whole relations in the presented materials.

The sequencing of sessions over the course of the day further highlights the differing visual availability of previously presented material. As noted, in the poster based setup, all the students' proposals are pinned up next to each other, usually on screens placed in the central atrium of the school. A short excerpt from a first year critique serves to illustrate how this is utilized as a resource in the work of the critics.

EXCERPT 2

201 Ben: then if we move over to the actual volume then (.)
202 it's very obviously two volumes that are connected.
203 the next proposal that's two volumes that are (.)
204 superimposed.
205 (1.0)
206 and e::hm that has its own problems I think (.) one
207 very apparent technical problem is, (.) this solution

Here, one of the critics moves from one topic, the interior design of a student's proposed atelier building, to another, the overall design of the building's volumes. He highlights a distinction between "connected" and "superimposed" volumes by comparing the current project to the next. The significance of the contrast is not communicated by the lexical terms alone, but also by gestures that highlight the two volumes of each proposal, their interconnections, and crucially doing so in the context of simultaneous visual availability of the different designs. The contrast establishes a frame for understanding the critic's ensuing remark that the connection point of the roof of one volume with the wall of the other creates a pocket ("this solution," line 207) that will cause problems with sealing. While being "apparent" to an expert, learning to see and avoid technical problems of this kind is an important part of what it means to become a competent architect (see Lymer 2009, for some further analyses of this episode).

As this fairly simple example illustrates, in the poster based setup, unlike in the projector screen setup, the temporal succession of sessions are available for reference in and through the spatial configuration of posters. This configuration is regularly used as a resource by critics, referring backwards to what was presented previously, and forwards to what comes next. Thereby they can indicate and elaborate, verbally and gesturally,

similarities and differences between proposals to bring out significant aspects of the critique.

Establishing shared reference through talk and gesture

In this section, we address the different ways in which shared attention is established through talk and gesture. Both presentation and critique is characterized by extensive use of the body in elaborating the artifacts under scrutiny. Gestures are employed to highlight details in proposals, to suggest alternative designs, and to formulate and describe designs in assessment. Establishing a shared understanding of formulations by referring to details in plans requires the mutual availability of those details. Indeed, the whole business of design reviews hinges on this establishment of shared attention to detail. In a study of a telephone services control centre, Hindmarsh and Heath (2000, p. 3) note that participants' ability to "notice, discuss, and investigate particular features of their immediate environment" is a necessary requirement for the accomplishment of much collaborative work. In the different setups studied here, participants have different possibilities of establishing such shared references. The public availability of gestures can be hindered, leveraged, or otherwise influenced by the technologies and spatial organizations employed; the *displays* in use shape the detailed production of *displays* by participants (cf. Crabtree et al. 2003).

Touching on these issues in an analysis of the use of PowerPoint, Adams (2006) claims that this software "enhances, quite literally, the ability or power to point [...] A teacher can now point more accurately, vividly, and rapidly at text and image [...] Indeed, pointing, or the act of signifying, is a central activity of pedagogical practice" (p. 398). Although we concur with the centrality accorded to pointing or signifying for instructional practice (see Roth 2001, for a general review and discussion), it is important to note that Adams is comparing the use of PowerPoint to the traditional lecture with unaided speech (and gesture). Furthermore, while pointing is indeed a central resource for the participants in the architectural design review, signifying involves a broader range of gestural action of which the basic deictic is only a subset. In relation to this broader range, and contrasting as we do here the detailed ways in which *different* tools are employed in design review practice, a more complex picture emerges.

In the poster based setup, participants are positioned in immediate proximity to the presented materials. The presenters deliver a narrative with a basis in the spatial arrangement of the available materials. The work of coordinating the talk with certain places in the poster is often carried out by gestures. In this setup, there is a wide array of different kinds of gestures, which vary in duration and precision. The marking of location can be done in swift motions or as prolonged steady actions. As for precision, pointing is sometimes done with the flat of one's hand, with a pencil, or the index finger, while at other times the expressive potential of the hand as a three dimensional object is utilized.

One way of elaborating design ideas is to organize the gesture in close connection to the printed material provided by the poster. In Fig. 4, a student traces the extension of two parallel walls of the proposed building with her right thumb and index finger while she simultaneously says, "the hotel is very transparent." This is part of an elaboration of how she has worked with staircases and elevators to get light into an internal courtyard. The gesture indicates the unobstructed flow of light through the glass and steel construction. While the reference of "the hotel" in the talk is very unspecific, hearable as indicating that the transparency is a feature of the hotel as a whole, the gesture specifies the particular structures that are intended. The graphical elements of the plan simultaneously provide the



Fig. 4 An environmentally coupled gesture over poster

student with a structure for the delivery of the gesture, and a resource for understanding the talk. It is an example of what Goodwin (2007) refers to as *environmentally coupled gestures* – the mutual elaboration of action, talk, and the material surround. Studies of the work of architects and of instruction in architectural education (e.g., LeBaron 1998; LeBaron and Streeck 2000; Murphy 2004, 2005) have demonstrated the central role of gesture for the accomplishment of architectural reasoning. Murphy (2005) shows how architects elaborate two dimensional plans and drawings through the production of what he calls *gestural objects*, ephemeral but locally referable shapes, created by way of gesture, and temporarily available as interactional resources. It is concluded that these, along with the material surround and verbal accounts, all serve as integral aspects of the communicative process of formulating building designs. In a similar vein, LeBaron (1998) analyzes talk and action during architectural critiques and argues that, “gestures are used to simultaneously accomplish and display architectural knowledge: its production, distribution, and evolution” (p. 57).

In stark contrast to the gestural objects created in the interplay between hands and posters stands the practice of using a laser pointer, which is common in conjunction with projector screen technologies. Depending on the size of the projection screen, and the physical placement of presenter/critic, the presented material is sometimes out of reach, making the laser pointer a convenient option. The laser pointer, as a prosthetic gesturing device, could be seen as coupled with its own class of gestural objects.

In Fig. 5, one second of laser pointing has been superimposed on the projected view (for the talk accompanying this gesture, see Excerpt 6). There is a “restless” quality to the produced markings, stemming from the fact that it is practically impossible to keep the pointer completely steady: Even the tiniest of movements are multiplied by the distance to the screen. Further contributing to the restless character is that a point of light sometimes can be hard to see; moving it back and forth might thus be a strategy for increasing its visibility for the audience. Another defining aspect is the inescapable two dimensionality of the laser point. The pointing gestures can only “buy into” the third dimension from the presented displays (as, for instance, in a perspective like Fig. 5). In contrast to a three dimensional gesturing hand, the laser point can never add dimensionality to a flat surface. In an evocative formulation, Bill Buxton (Baecker et al. 2008, p. 2247) describes cursor like tools for referential action such as the laser pointer as giving participants, “the gestural and referential capability of a fruit fly” (see also Luff et al. 2006).

However, some caution should be exercised when downgrading the gestural objects created by the use of the laser pointer. As demonstrated by Knoblauch (2008), the use of

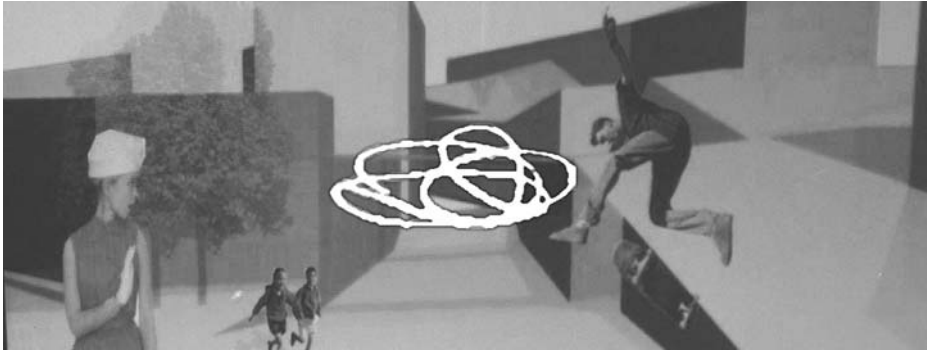


Fig. 5 The anatomy of laser pointing

laser pointers can indeed provide useful resources by which “the objects talked about can be identified and ordered” (p. 81). Furthermore, the movement of the laser point can animate otherwise static images and introduce dynamic elements of movements and processes. Note again, however, that in Knoblauch’s analysis, as in that of Adams (2006), these functionalities are seen in terms of the contrast with unaided speech (presenting without the support of visualizations). As compared to the gesturing hand, the laser pointer does have some serious limitations, influencing what it means to display a given content for an audience.

In the projector and screen setup (see Fig. 2), the critics are often positioned behind a desk to one side of the room. This entails remoteness to the screen, which is subsequently managed in a variety of ways: by gesturing from a distance and/or by using the laser pointer. Getting up and moving around the table is less frequent in the material. It could be noted that this strategy introduces the problem of casting shadows on that which is being referenced.

The following excerpt exemplifies another recurrent way of managing this problematic, a critic resorting to gesturing over his private printouts of the presented project. As was commonly the case, members of the audience in this session do not have copies of their own. Furthermore, no attempts are made to get the corresponding slide displayed in the projection, as in Excerpt 1. When producing environmentally coupled gestures over privately held projections, the visual aspects of this work become accessible mainly to the critic him or herself.

EXCERPT 3

301 Dan: I think that in spite of the references in my
302 opinion it’s completely warranted in your proposal
303 (.) and that you almost make it more credible than
304 the Jussieu library is in eh Paris (.) or never was
305 in Paris (.) actually (.) the vertical diagonals eh
306 the lines the lean- the inclining ehm joists that
307 also get their imprint in the construction which I
308 believe feels very refreshing in my mind (.) this eh
309 framework principle which gets a displaced dimension
310 which becomes something, (.) so where the inside also
311 makes an imprint in the façade and in the
312 construction

Excerpt 3 is drawn from a design review making use of the projector screen setup, with participants organized as in Fig. 2. In this excerpt, the critic has at length commended a student's proposal for a combined media library and local transport hub. A central component of the critique is the comparison of the student's proposal with two well known library projects: the public library in Seattle and Rem Koolhaas' proposal for the Jussieu library in Paris (which actually, as the critic notes, never was built). In architecture, apparent similarities to existing designs are not in themselves problematic. Quoting a feature of a famous building can be a way of doing homage, and of situating one's design within a tradition. This can be done in more or less aesthetically legitimate ways, however, with plagiarism and lack of individual creativity being potential issues; the critic's emphasizing that the references are "completely warranted" in this particular case implies and highlights the delicate nature of the practice. In order to ground the positive assessment, the particular qualities of the students' proposal need to be detailed. This is done by way of gestural elaborations of the plans, explicating amongst other things the sophisticated use of the construction in creating an aesthetically appealing exterior expression.

In doing this, the critic formulates how the student has used inclining joists and a "framework principle," which "gets a displaced dimension." Along with the expression "displaced dimension," he also makes a sequence of gestures superimposed on his own copy of the façade drawings (see Fig. 6). In line with the argumentation provided by Goodwin (2000), we hold that the communicative action carried out by Dan is built through the conjunction of talk, gestures, and details of the printed materials. The gesture printout parts of the action complex are not adornments to the talk; they are a potential resource for understanding the critique. As Heath and Luff (1992, p. 333) phrases the matter in a different context, "the talk gives sense to and elaborates the gestures, and the gestures themselves illuminate and provide a vehicle for the interpretation of the talk." Thus, because the visual aspects of Dan's delivery are inaccessible to most participants in this excerpt, one must acknowledge that the audience is left with only parts of the actions that are used to work up the meaning of the notion "displaced" in this situation.

A different aspect of the spatial configuration and visual availability of the presented materials concerns their size. In posters, space is a limited resource. For architectural practice, moreover, there are norms regarding what scale to draw things, and hence, for the actual size of the projections included in paper based presentations. In the projector screen



Fig. 6 An environmentally coupled, but private, gesture

setup, the resulting size of the presentation is contingent on the technology and the students' design of the slideshow. This implies the possibility of making even minute details accessible to all observing participants. Regardless of the size of the objects attended, however, there is a need to create some sort of mutual alignment to and understanding of these details, which again highlights the differing affordances for gesture in the different setups.

Coordinating parts and wholes

One important aspect of pointing and referring during the design review is the ways in which participants establish part whole relations between details in plans and drawings, on the one hand, and the whole proposal, on the other. Both the presentation and the discussion phase involve zooming in on details, which requires the establishment of a shared awareness of where this detail is situated. A grasp of the whole is a requirement for an understanding of remarks on parts of that whole. An understanding of the whole structure of a building can also be achieved through the assembling of different projections (e.g., plans, sections, elevations, and drawn or computer rendered perspectives). That is, although a student proposal can be said to have an existence apart from the particular representations employed to show it, the actual set of renditions build up what becomes, for all practical purposes, the proposal (cf. Hindmarsh and Heath 2000). Relations between parts, and between parts and wholes, are thus critical for the ways in which the design review unfolds.

Here, a parallel can be drawn to the analysis made by Stark and Paravel (2008) of the finalists' presentations for the redesign of the WTC site. In noting presenters' rhetorical use of the rupture between slides, the authors describe presenters as:

Moving abruptly from one kind of image to another from site plan, to digital rendering, to technical drawing scaling up and down, here moving forward in time to present a glimpse of the final product and then moving backward in time, within an overall logic that tends toward completion. By doing so, the demonstrator allows the spectator both to understand the concrete detailed arrangements of the abstract future project and to give her a good sense of how it could stand up and fit in the landscape. (p. 41)

The authors thus provide a predominantly appreciative view of the rupture effect, claiming that a coherent and understandable image of the project is built up through the sequential presentation of different projections. The analyzed presentations, however, were ones where interaction with the audience was at a minimum. These were large scale public presentations and not events where the details of the designs were to be scrutinized and dissected. The contention that presentations gave the spectator a "good sense" of the project was, therefore, not based on analyses of spectator actions, but rather on the authors' own observations. But attending to a presentation in order to be able to provide criticism in the next turn entails another "mode of listening" (cf. Ekström et al. 2009) than does adopting the position of "spectator"; the critic is accountable for a very different understanding of the project than the mere onlooker, one that is to be shown in the production of reasoned discussion of the qualities of particular solutions.

In an episode from a fourth year review (Excerpt 4), one critic, Sam, notes a discrepancy in the positioning of a ventilation shaft in different parts of the building. In negotiating this issue, the student, Sue, and the critic coordinate pointing gestures over different parts of the displayed posters, utilizing the simultaneous availability of different views of the building.

In the excerpt, <numbers> correspond to where participants point during the course of their utterances, represented by the numbers in Fig. 7.

EXCERPT 4

401 Sam: what is <1> this
402 Sue: that's a shaft
403 Sam: and where does it go from there
404 Sue: it goes down <2> to the basement (.) here and down to
405 the,
406 Sam: <3> it comes down in a different position <4> from
407 that one <5> as far as I can see you have the lifts
408 here (.) if it had been <6> just under that <7> it
409 would have been here

In the production of architectural plans, it is absolutely critical that different projections, and, as in this excerpt, plans of different floors of a building, match; there can be no discrepancies in the positions of, for instance, load carrying walls, ventilation shafts, and other structural and infrastructural parts of the building. Despite the very basic nature of this for architectural design, it is not self evident that novices (or experts for that matter) will produce plans without faults and glitches. Learning to see architectural plans, and coordinate different parts of plans, is, thus, a central part of professional vision in architecture.

In relation to the affordances for seeing such glitches, the spatially organized presentation in the poster based setup allows for an opportunistic juxtaposition of different views of the proposal. Excerpt 4 shows how two different floors are coordinated in talk and gesture that shift between pointing at different parts of the poster. References of words and gestures alternate between the two floors. These shifts occur rapidly; during the course of the utterance of the word “that” in line 408, the critic refocuses the attention from the ground floor plan to the basement. In subsequent turns (not included), yet other parts of the presentation a section, as well as plans from other floors are included.

As illustrated and discussed in relation to Excerpt 1, the sequential delivery of slides in the projector and screen setup creates obstacles for such concurrent use of different views. Compared to the rapid shifts of deictic reference in the poster based setup fitted to the duration of a “that,” for instance coordination in a sequence of slides requires jumping between views that may or may not be in immediate succession in the presentation.

An excerpt from a design review session making use of the hybrid setup serves to illustrate both issues of coordinating views in sequential presentations, and how these issues are addressed by recourse to resources made available through the additional presence of posters. Figure 8 shows the situation. A student, Rico, is presenting his proposal. He is mainly using the laser pointer to point to both screen and poster.

EXCERPT 5

501 Rico: and here <slide A> we have some views of what I'm
502 thinking (.) this is the main view, (.) caught from
503 (.) here, <poster> (.) through here (.) <slide A> and
504 we can see the (.) path underneath that goes
505 underneath (.) and how the landscape rises (.) just
506 (.) at this point <poster>

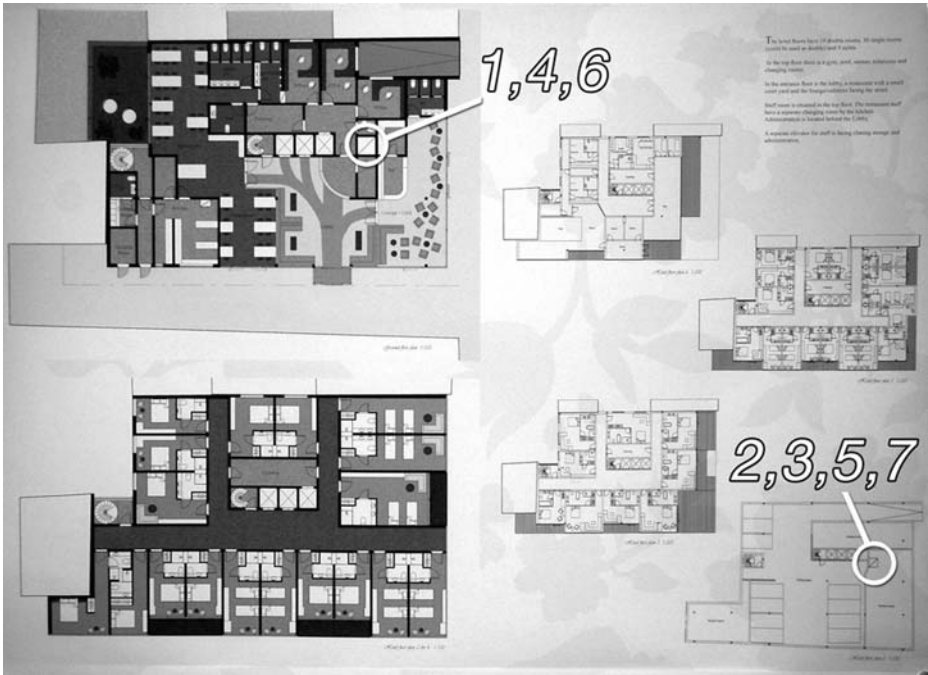


Fig. 7 Poster, and positions of pointing gestures

In Excerpt 5, the presenting student Rico projects computer renderings of his urban design proposal. Rico formulates what he is doing as showing “some views of what” he is “thinking.” His thinking here is specified as the specific design choices he has made, the consequences of which the viewers are invited to “see” (line 504): “the path underneath” and, “how the landscape rises.” These are the central elements to be seen, produced by Rico as parts of his argumentation for the overall design. Because the argument is built on the assumption of a shared perception of the elements, and as the renderings represent views from a particular place in the planned area of the city, the issue arises of positioning those

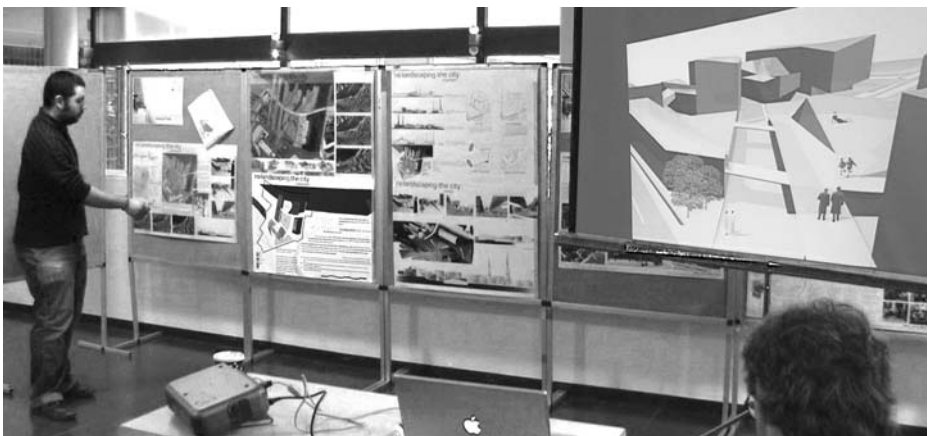


Fig. 8 Rico, presenting with poster and screen

renderings in a way accessible to the audience. The purported seeing of the inclusive “we” on line 504 needs to be *achieved*. Here, Rico turns to the available posters (see Figs. 8 and 9), indicating the point from where the projection is taken, and the line of sight corresponding to the depth dimension of the image.

In Excerpt 6, a few turns after the end of Excerpt 5, Rico continues his presentation by shifting to the next slide (Slide B, see Fig. 10). This slide contains a projection from the same point in the overall plan, but taken at a lower altitude, closer to ground level. Rico starts describing the structures that can be seen in the projection:

EXCERPT 6

601 Rico: <slide A to slide B> here we can see (.) a path in
 602 the middle going (.) straight to the the eh housing
 603 block and the=
 604 Sven: =can you point there too
 605 (0.5)
 606 Rico: <poster> it's this path (.) seen from here

On line 604, Sven, a teacher in the course, interrupts Rico’s description of the new slide, urging him to “point there too,” referring to the posters. Thus, Sven is asking for a similar positioning as the one initiated by Rico in Excerpt 5. Rico does so, indicating the same trajectory of the laser point as in Fig. 9. For the reader of this paper, the two slides are available for inspection and comparison, allowing the matching of corresponding details. The fact that slides A and B represent views of the same structure can be discerned, albeit with some effort. Due to the sequential organization of the slideshow, however, the audience attending Rico’s presentation does not have access to this juxtaposition of slides.

The possible trouble noted by Sven in Excerpt 6, and also oriented to by Rico in Excerpt 5, was due to the sequential and discrete nature of the shift between slides. Rather than orienting toward this kind of rupture as a “compositional effect” (Stark and Paravel 2008, p. 33), the participants seem to address it as problematic for their understanding of the presentation. In the hybrid setup, resources for a workaround were available through the pinned up posters next to the screen. In the projector and screen setup, on the other hand, access to an overview is harder to achieve ad hoc. Of course, such projections can be



Fig. 9 Slide A and detail from poster, with arrow indicating trajectory of laser point

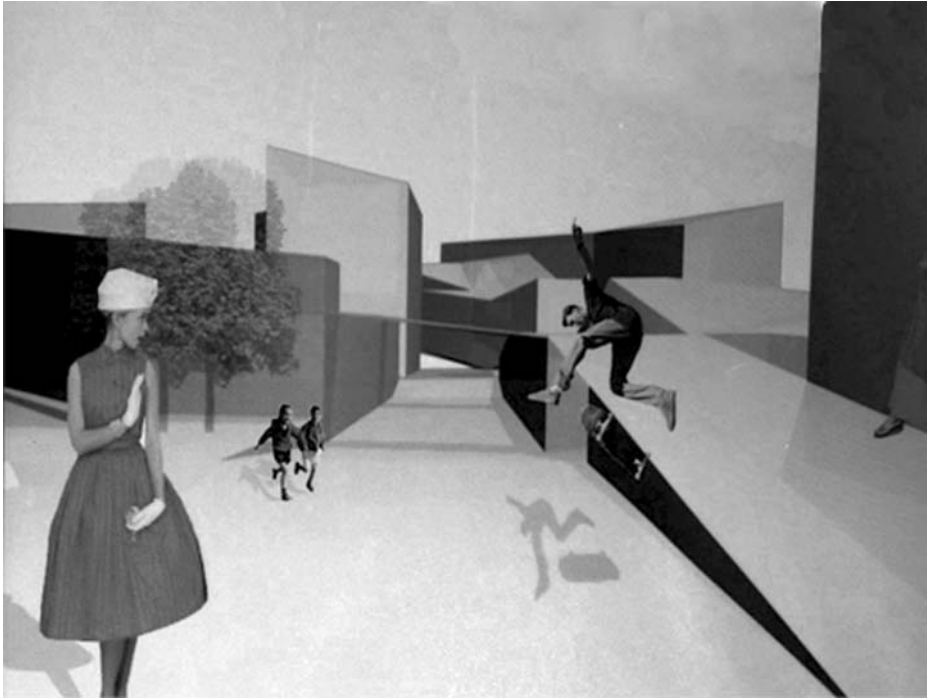


Fig. 10 Slide B

included in each slide, but this necessitates a choice of which overview to include. The hybrid setup allows for creative solutions to a range of occasioned troubles.

Discussion

The empirical analyses present the design review event as transformed in subtle yet consequential ways by the introduction of digital presentation technologies. These transformations are consequential not only locally, for the design review itself, but also for the instructional work that is accomplished through this practice. As argued in the introduction, design reviews are central settings for architectural education, in which professional vision is exercised, taught, and learned. One central finding in studies of professional vision is the degree to which specialized disciplines rely on specific representational artifacts. Furthermore, collaborative work depends on the discursive and gestural action through which representations are highlighted and elaborated. As different presentation setups create different affordances for unpacking and elaborating the materials scrutinized during review, the ways in which architectural knowledge is exercised, communicated, taught, and learned in these situations are transformed along with technological change. This implies that there are both potentials and risks involved in replacing posters with digital slideshow technologies. In particular, technologies designed primarily for the authoring and delivery of presentations might in some ways be unsuitable for practices such as critique, which are dependent on subsequent discussion of the presented materials.

When discussing the different affordances of the investigated setups, it is important to note that we are not contrasting the technologies themselves, but rather the ways in which they are employed in the constitution of temporally organized and spatially situated events. The central consideration in understanding tools for design review practice, then, is not the contrast between digital and traditional technologies per se – screens as opposed to posters, say – but between different ways of organizing time and space in the review. That is, presentation technologies cannot be understood as simply incorporated in existing review practices, but as reshaping these practices, and also the spaces in which design reviews take place (see Figs. 1, 2 and 3).

Design issues

Although this study has presented analyses leaning toward stressing problematic aspects of the projector and screen setup, it is important to note that this might still be the preferred technology in many circumstances. Digital presentations are portable, do not require a lot of space, and can be delivered in any type of room equipped with projector and screen. If used in a productive way, moreover, projections on screens have the potential of increasing the visual availability of architectural details for the audience. The investigated presentations all used projector and screen for doing slideshow presentations. As was stressed in the previous section, it was this format of the presentation and its associated use of technology, rather than the technology per se, which contributed to the characteristics described above. Instead of simply stating the desirability of preserving the traditional organization of the review, a more productive approach might thus be to discuss possibilities for addressing the issues raised in the analysis.

In the hybrid setup, the ways in which participants shift between posters and screen, and employ different resources for different purposes, suggest that there are points where the suitability of one setup leaves off. How they are used in conjunction, furthermore, shows participants' own solutions to possible problems. One recurring issue in the literature on slideshow presentations, as well as in our empirical material, is the disorientation caused by the sequential organization of slides. In the hybrid setup, this is resolved by shifting between posters and screen.

In order to come to terms with this problematic also in situations where only the projector screen setup is used, addressing the discrete nature of the slides, and their spatial and temporal organization, would seem to be desirable. Zoomable user interfaces as applied to slideshow presentations (Good and Bederson 2002; Holman et al. 2006) represent a possible approach to some of these issues. The idea with these interfaces is to display information on a “conceptually infinite two dimensional plane” (Good and Bederson 2002), where movement through the material is represented by acts such as sliding, panning, and zooming. Rather than realizing sequential slideshows, presentations designed in this way could potentially take on other forms, more suitable for unpacking complex three dimensional designs for purposes of critique and discussion. A spatially organized and zoomable presentation setup for architectural design reviews could be obtained with relatively few interventions in existing practices. As students regularly use PDF documents with vector graphics, zooming in on details could be done in an ad hoc fashion; displays of details for the purpose of elaborating a specific argument in critique or presentation need not be predefined, but can be done opportunistically as such requirements arise. A minimal suggestion would then be to design presentations as single two dimensional vector graphics images, and build support for easy zooming and panning actions. To support the presentation phase, it should also be possible to define a sequence of moves between

different parts of the presentation, and between different degrees of magnification. This would allow problems with disorientation, in particular the establishment of part whole relations, to be alleviated, while still retaining support for authoring coherent narratives for the presentation phase.

Support for, or functional alternatives to, the kind of rich gestural action observed in relation to pinned up posters, however, might prove more complicated. Several studies in the field of media spaces have shown the importance of shared reference spaces for collaborative work, and also the difficulty of replicating the expressive capabilities of the gesturing hand with cursor like pointers (e.g., Baecker et al. 2008; Heath and Luff 1992; Luff et al. 2006). Furthermore, it has been found that users of systems for computer mediated interaction tend to employ gestures as expressive resources even when they are not immediately visible to interlocutors (Heath and Luff 1992). Similar arguments are applicable to the projector screen setup for architectural design reviews. When positioned at some distance from the screen, critics tend to point at details of student proposals from a distance, rather than produce elaborated gestures over those details; alternatively, they use laser pointers or gesture over printouts with limited visibility for other participants.

To resolve some of the issues raised in relation to the establishment of common references, the spatial configuration of projector screen reviews could be designed with an eye toward making it easy for critics to get up and approach the screen although the conventional use of projectors places some limitations on any actions performed in front of the screen. Generally, an increased awareness of the role of environmentally coupled gestures and the gestural objects they produce might itself be an argument for critics and students to engage more closely with the relevant domains of scrutiny. Otherwise, there is a risk that a range of architecturally relevant action, which is an integrated part of traditional poster based reviews, is left behind when digital slideshow technologies are employed.

Conclusion

In a discussion of the use of PowerPoint presentations in education, Vallance and Towndrow (2007) argue for the importance of “informed use” of digital slideshow technologies. That is, users need to develop an awareness of the ways in which the tools may come to shape, sometimes in unacknowledged ways, the practices into which they are incorporated. Through empirical analyses of design reviews, the study reported here provides resources for such informed use, both in the context of architectural education, and for presentation practice in general. An increased awareness of the ranges of communicative phenomena that are influenced by different presentation setups might be key for the proper adaptation of presentation technologies to particular purposes. For design reviews, assessment and discussion of presented materials are essential, which highlights a set of issues less pronounced in, but nevertheless relevant to, settings with a more exclusive focus on rhetoric. Here, we note in particular that design review practice brings issues of shared reference spaces to the fore, usually addressed mainly with regard to media spaces for distributed interaction. Furthermore, we suggest spatially organized presentation interfaces as a possibly fruitful approach to the design of presentation tools, in architecture and architectural education, as well as in other contexts where presentation and discussion of complex designs form part of daily work practice. Apart from discussing the affordances of different technologies, the study has aimed at exploring the interactional challenges involved in talking a design to life for the purposes of presentation and critique. The analyses have also attempted to highlight the instructional character of design reviews, with

a focus on the ways in which the media employed to present student proposals influence how architecturally relevant phenomena such as “displaced dimensions,” “technical problems,” “structural relations” and the like are worked up as accountably visible and learnable.

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