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2010-10-01

Multi-purpose Space for architectural education
- Aspects of usability of facilities for design-reviews

Abstract

The context of this study is a pedagogical research-project in existing education of architects at Chalmers University of Technology, Sweden, studying the design-reviews. The study concerns usability and quality of space. In what ways can space support the pedagogical activities of the critics in architectural education? The main empirical material was video-recordings and a questionnaire. Results show that space can support the pedagogical activities by offering places for both examination and pedagogical dialogue. Aspects related to space that can facilitate the activities of the critics in architectural education are good condition concerning light, acoustics, ventilation and space enough. The multi-purpose use of the space is necessary, and arrangements of settings is of huge importance for creating interacting situations, and for making a dialogue at all possible.

Keywords

Education facilities, usability, design-reviews

Context

The context of this study is a research-project in existing education of architects at Chalmers University of Technology within research-project Professional competence in educational practice: The immanent pedagogies of design reviews, carried out in 2007 – 2009 by department of Education at Gothenburg University.

Research question

The study concerns usability of space and the importance of qualities of space in the design-reviews in architectural education.

The main question of this research is: In what ways can space support the pedagogical activities of the critics in architectural education?

Some related sub-questions are: What kind of aspects related to space can facilitate or obstruct the activities of the critics in architectural education? What kind of settings can support design-reviews as a pedagogical moment in design-educations? How does the multi-purpose use of the space influence the possibilities to carry out the pedagogical work well?

Background

This is one study within the research-project Professional competence in educational practice – The immanent pedagogies of design-reviews. This project started in 2006 and concerns mostly the pedagogy of critics in architectural- and design-education. The project is hosted by the department of Pedagogy at Göteborg University. The project provides an account of how architectural competencies are made visible in the work of critique in architectural education. It shows how critics enact a set of disciplined visual practices through which architectural qualities of proposed buildings become available for competent remark.

The concept of professional vision, originally defined and employed in relation to the work of archaeologists and court professionals (Goodwin, 1994), has served as the focus of studies of other practices in education, with a common interest in the "socially organized ways of seeing and understanding events that are answerable to the distinctive interests of a particular social group" (p. 606)

Basic aspects of design-theory are also of interest here. The design-process have been described as both Reflection-in-action and Reflection-on-action by the design-researcher Donald Schön, (Schön, 1983) The Swedish design-researcher Jerker Lundeqvist has broaden the concept of design to a social process for managing questions where the problems not primarily will be solved, but rather made manageable (Lundeqvist, 1995).

The researchers of the research-project Gustav Lymer, Jonas Ivarsson and Oskar Lindwall states the importance of the spatial conditions for design-reviews: "… the spatial organization of the event, how participants are aligned towards the discussed materials, and the technologies used to shoe those materials, have a profound impact on the ways in which a shared sense of the critique is achieved." (Lymer et al., 2009)

Definitions

For the reader to understand the context and situations of this kind of pedagogical work and some important aspects of physical space, some definitions are needed.

The critique, ´crit´ or design review is a central pedagogical practice in architectural educational programs around the world. It is the moment where students present the result of their design-work and where teachers and sometimes also external tutors give comments and critics to to the result of each student or team.

Room or Space is a physical area where human actions take place. Göran Lindahl argues that the room can be regarded from four aspects: The room as workspace, the room as a metaphor/symbol, the room as configuration and participation (Lindahl, 2001). This is relevant in this study, as the room for critics are workspace, their configuration has influence on their usability and the purpose of the critics is, at least in the Nordic context, to invite all partaking persons to participation. Whether the studied room also serve as symbols is highly depending on their location and other uses such as for example facilities for exhibition.

In the research-area of workspace an important aspect of the space is the possibility to use the space, rooms, or buildings intended. The following definitions are normally used to define what is characterizing the use in built space.

Usability means the extent to which a product can be used by specified users to achieve specified goals with *effectiveness*, *efficiency* and *satisfaction* in a specified context of use [ISO 9241-11]. Usability cannot be evaluated on the product - only in the situation of use that depends on users' values in culture, context, time and situation. Usability has partly to do with the properties of the product, but even more with the process of design and use. (Granath & Lindahl 2006)

Another related aspect is the functionality. **Functionality** means **t**hose *practical effects* derived from the *physical properties* of a product that might result in usability in certain situations for certain users. Functionality can be evaluated on the product.
Flexibility meant originally how easy it was to change a facility to fit new purposes, but has lately got a broader meaning of multiple use, with or without changes and rebuilding.

Education of today
Some general facts on how the education on architecture and other design-related professions is performed, will ease the reader´s understanding. Generally, the design- 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).

The way to present propositions, sketches and drawings is currently changing from paper-posters, into more use of digital technology by using slide-shows on computer-projector (Stark & Paravel, 2008). Digital presentations are often used instead of the traditional way of pinning up paper-posters on the walls or on screens. Some teachers like to perform in both ways at the same occasion, as the two methods have different advantages. The way to present propositions, sketches and drawings is currently changing from paper-posters pinned up on wall or screens, into more use of digital technology by using slide-shows on computer-projector.

OBJECTIVE

Aim of this study is to complete the picture of the design-review as a pedagogical method that is now developed by the project professional skills. There is also a pragmatic objective to gain knowledge of suitable premises for just criticism briefings. Such knowledge is an important prerequisite in all local audits at irregular intervals are at the architectural education, and which is now recognized as at least courses at Chalmers and KTH is facing extensive rebuilding and / or new construction.

Many teachers with long experience could reasonably be argued that such knowledge exists, but the problem is that it is not documented, but only as a praxis-knowledge of individuals. Thus, a third purpose is to document, analyze and structure the practice of knowledge on the characteristics of suitable premises for criticism briefings. A structured knowledge provides better decision support both at the daily teaching work at the local Court and is part of the quality work of current institutions.

METHOD

The research method chosen, is a combination of different work-methods. Combinations of methods according to similar patterns are frequently applied approaches to qualitative research (Patton, 2002).

This study is based on results from of a combination of the following working-methods:
- Observations through video-recordings made in the research-project
- Part-taking observations, through several years as a teacher in architectural education.
- A short questionnaire, as a complementary method

Video recordings were made in 2007 at the education of architects Chalmers University in Gothenburg in the project Professional and research skills, which studied the critical reviews as a method for not only the assessment or examination, but also as a teaching method to impart knowledge and to engage in dialogue about architecture based on students' representations (Lindwall et al. 2008)

Part-taking observations have been based on the author's extensive experience in critical reviews, as well as responsible and coaster teacher, assistant teacher and as an invited critic of teaching moments in which other teachers have been graduates of creative project work and thesis work in the years 1990 to 2009. This experience has mainly been at the Chalmers University of architectural training, but also from other architectural education in Sweden, and occasionally in Norway and in France.

To get a broader picture of the experiences of different kinds of criticism briefings and to broaden the test materials to several rooms or buildings, I have also conducted a small questionnaire. The title of that study is "Ten questions about space for design-review" and it has the magnitude of just 10 questions. Most of the questionnaire questions were of a type with several choices combined with opportunities to freely answer the questions, while some questions were open questions.

The questionnaire was sent out to teachers and colleagues at the department of Architecture at Chalmers and also to some colleagues at other schools of architecture in Sweden. It was distributed to Swedish architecture and design courses, both in an educational discussion organized by the Swedish Association of Architects in autumn 2009, and through mailing lists. 25 persons answered the questionnaire, 13 of them were working at Chalmers and the other 12 were active at other Swedish courses, the majority of architectural education and some at the Design Programs.

RESULTS

The results obtained in this study are thus based on a balance of observations from these 3 methods altogether, and not from each method separately.

The results from the video-recordings concerning the physical environment are limited to the kind of rooms or facilities that were used at Chalmers Architecture at the time of the video-recording in spring-semester 2007.

The first question in the questionnaire, "Ten questions on space for design-review" was the choice of the type of room where most of the criticism was. The majority of respondents (68 %) indicated that their choice of room in the first place was a traditional classroom. This refers to a common room with the approximate area of 60 - 70 square meters. This type of facility has been frequently used even in design-reviews on other architectural education as the author visited. Next, on the list of widely used types of premises came two types of room: Sub-large, open rooms or areas, where several activities such as other design-reviews, can be made simultaneously, and "other location". This last category could include Studio, corridor, review-room, full-scale laboratory and also outdoor, in the open space.

The inquiry also had the options "Small Rooms" and "lecture hall". The responses indicate that these rooms were used to a lesser extent. The lecture halls were used least of all the alternative room types.

Do you have any kind of ´crits´ or review in the students' regular work space (studio or similar) and if so, what are the benefits of this choice? The responses of this question were distributed fairly evenly, just over one third responded that there were sometimes, and clarified that it was then "middle"-crits´ or reviews more with the purpose to follow-up than for examinations. As many persons answered yes, as those who answered no to the question, but many persons commented on their answers to this question.

Questions concerning the selection of space, room or facility are intimately linked to the type of representation that was used at the time. Therefore, although the issue of choice of representation method relevant. The majority (64%) of respondents worked with the students' projects represented on paper-copies posted on walls or screens. 9 persons (36%) answered that they mostly used computer-representations, projected on a computer-screen on the wall, and the same number of answering persons mostly used the combination of both paper-copies and computer representations. None of the respondents answered that they used two or more computer representations.

What do you consider to be the most important aspects of the facility for design-reviews? The respondents could grade the importance from no importance at all up to huge importance by using the numbers 1 to 5. The aspect that was considered most important was that the room or facility has suitable equipments. (It could be screens, furniture, computer-projectors etc.) The second most important was that the equipment was in place and that it was really working!

The fact that more than half replied that it was very important that the equipment was in place and functioning, can be considered to reflect that they had experience of this not been the case. Even good acoustics were considered very important. Good lighting, good ventilation and appropriate room size was considered important but not essential by most of the respondents. The fact that the room had a central location and advertising was considered by most respondents as not important at all. Some people had added their own comments on this issue:

"That you can get concentration. Possibilities to arrange settings in relation to posters and projector - no one should "left out". "Comfortable chairs." Flexibility in terms of furniture and possibilities to pin-up paper. "" The room is easy to find for external critics and other interested persons."

A small remembrance that it actually is a teaching moment for aspiring architects, show the following comments: "The room should be beautiful and pleasant to be in - which is rarely the case." "A representative and presentable place - good architecture that increases the presentation of something important."

The poll's fifth question related to what purposes was considered to be the main purpose of the design-review. A design review may have several purposes. Questionnaire responses show a great number of purposes. They would roughly be broken down into objectives which either are related to education or to control of the student´s knowledge.

For the knowledge-controlling purposes are no special requirements on the use of the premises.

For purposes related to education, however, requires from the fact that teaching is reaching more students than the one or those whose projects are reviewed at that time. The basic requirement is of course that all participants can see and hear what critics and student are doing, in order to keep up with their reasoning. This applies, for example, that presentations are either large enough to be seen by many participants, or to the participating group of students is small enough. The teaching of architecture conducted at Chalmers and other architectural schools in Sweden, means that the dialogues between teachers/critics, and students are important. Thus, the requirements for premises used for design reviews, are that these will facilitate the participation of all be involved and to participate in the dialogues.

Therefore, when we look at the answers in the questionnaire, it turns out that most respondents considered it to be very important to have a dialogue with students about architecture issues based on specific examples of presentations (80%).

Just over half responded that it was very important to highlight the architecture issues from multiple perspectives through the participation of guest critics, or more that one teacher. (13 of 25)

When one chooses to aggregate the responses from those who think it is important and very important, it becomes clear that design reviews also have an assessment purposes. 72% of respondents believe that the purpose of assessing the performance of individual students or student groups is important or very important. 60% of them believe that the purpose to control knowledge in a course is important or very important. Just as many believe that the purpose of teaching the practical

aspects of architecture based on presented examples is an important or very important purpose.

The purpose which was considered least important was to be a good ending to a completed project. Only 20% felt this was very important.

Some other objectives were highlighted in the comments:

- Linking to past projects and to pass on to the next project in the education.
- That the students get an opportunity to practice on performance, participation and critical thinking in groups. One respondent says it is practicing the communicative tools; oral performance, image, layout, etc.
- That students are trained in professional way to think about the architecture, concepts, terminology and so forth. An opportunity to develop the internal language, to make students both aware of what he has done and also give the student the opportunity to deposit their work in a larger context.
- Providing "formative testing" and "monitoring" of the learning process.

Question 6 and 7 was the time-use of the design-reviews. Almost 90% of respondents reported using a clear timetable for the time allotted. 68% add pauses after approximately one hour, while the other takes break after about 2 hours.

The eighth question in the questionnaire was: Do you think that a paper on how the ´crits´ can be implemented, a kind of handbook, would be good? 60% of respondents felt that this would be good. All of those offered to participate in the development of such a document. Some comments are:

- Yes, as inspiration.
- Yes, it's far too much personal discretion today.
- Important that the criteria for assessment in each case is clarified.
- Perhaps the "10 Commandments" or a very rough guide would work.
- Yes, if aspects of the diversity and educational advice included.
- Absolutely! As an analysis of what we achieve by design-reviews and how students perceive these occasions.

Some are uneasy about the idea, and one respondent think that the educating part and the assessing part of the design-review must be structured in different ways.

- Only if it is not describing how the criticism will be.
- Hardly a handbook, but a collection of examples where ideas can be retrieved.
- Perhaps it is a support but it depends of course on what is in the manual.
- No, it's so situational. But perhaps for understanding, not recipes.

Criticism that educational component in the architectural education in Sweden is a natural dialogue-oriented. We have a conversation on the students' statements, in comments, but above all we are using these as a starting point for various discussions. Part of the profession is to learn how to reason about architecture, the themes addressed. This knowledge we acquire through participation in the ´crits´. That is why I believe that a manual would be of limited value.

One teacher suggests a review sheet, which gives each student the opportunity to review another proposal.

Many of the respondents want to have a discussion about how moment of design-reviews can be developed.

The poll's final question concerned the proposed improvements.
A number of proposals that were mentioned about the locations of critical reviews or use of space:
- Better system for reservation of rooms.
- Coordination of space-resources so that the premises be allocated according to need, not for who book the fastest.
- Improve facilities, especially for the final critique. Better and more representative rooms are needed. Also several small group-rooms for the more informal ´crits´ would be needed.

- Make sure that the scheduling of design-reviews and rooms are coordinated.

- No competing activities (scheduling conflicts). Highlight the ´crits´ as an essential part of teaching, ie it is not the first few days following holidays.
- That ´crits´ is advertised so that outsiders know what is going on.
- Make sure that the digital projector starts with the push of a button.
The final ´crits´ is of course usually at the end of the semester, when there is intense competition for suitable premises in particular if the impugned material will also serve as a "show" or an exhibition. Then it is often hard to get access to more useful areas.

But also suggestions for improvement related to the criticism in general:
- We need a seminar and a course for all those responsible for the design-reviews.
- Seminars to share their various criticisms forms, and to put up strategies for criticism.
- A continued dialogue around the teacher's role and to develop the knowledge field guide and critique. Teachers shall present their thoughts on the ´crits´ of the college.
- A document that makes clear to all involved what role design-review plays and how it is supposed to work.
- Visualize the assessment criteria (part of the curriculum). Make a schedule with breaks after about 60 minutes. Give equal time to all students and all projects.
- The development of forms of criticism, where different variants can be used at different times and provide variety. Students can criticize each other in organized form before visiting critic begins, the involvement of lay people can be useful sometimes, hanging in the form of a poster presentation in which students are at their posts and jury / critics go around and comment is another form that can contribute to demystify the critical moment.
- Find ways to activate the students during the critique. Too often, the students who are not in a critical situation themselves appear too nervous (before his own view) or busy to thinking about the recently received ´crits´ for actually absorb what is going on.
- Not all teachers or critics respect that all students should have the same opportunities to discuss their work.

Some suggestions also came up related to resources and resource allocation:

"More teaching-time = fewer courses per teacher." "More resources to be the guest critic, teacher training specifically tailored for criticism in the architectural education." "Smaller student-groups will help."

One of the responses has been summing up pretty well what all of them said about necessary improvements:

A. Better adapted facilities

B. The responsible teacher shall in advance go through what he/she wants out of criticism

C. To make it clear for students the intention of the design-review already in their first year.

ANALYSIS AND DISCUSSION

Qualities and disadvantages of space in use can in general derive from a number of aspects such as: position, connections, square-metres, volumes, open or closed, sound-disturbance, constantly or not-constantly, sound- absorbents, light; natural and artificial, ventilation, colours, furniture; for the design-review activity, for other activities etc.

Some aspects of the physical environments are crucial and able to measure:

- The total areas of the actual studied space
- the measures of the actual space; proportions
- Ventilation of the area as well as lightning-conditions
- Acoustics in the space, as well as the materials in Surfaces, Interior layout, Furniture and other relevant Equipment.

All of the studied facilities showed to fulfill the basic preconditions of these aspects.

In the questionnaire was showed that the lecture-halls were used least of all the alternative room types. This may be because they often have floor in different heights, gradengs, for better oversight during lectures. But this was also the only response option, where the respondents indicated that these were used as the last alternative, ie, when other local facilities were not available.

Use of space and time

Most of the presented experiences in use of space are related to experiences of the students and teachers who are taking part.

The aspects of usage of space are seldom presented. Still some interesting questions remain. What took actually place? Where? What was the character of the space? How did the different partners act and move in the room? What method was used for presentations; paper-copies, power-points or a combination of both?

Organization in the meaning of organization of the use of time and space, goes hand in hand with, and may be seen as a part of the use of space. One example: To maximize the length of lessons to approximately 45 – 50 minutes, in order to enhance result of the ventilation system and at the same time adjust to the human brain, which cannot work in concentration for longer time than approximately 40 – 50 minutes.

Good organization makes the students more interested to stay and listen to other presentations and critics of other projects than their own ones, even after their presentation is finished. Organization in space and time are most often related to each other.

Some first general aspects are that there almost always is a need for multi-purpose use of the existing facilities of any School of architecture. In the architecture schools of Sweden and also in the other Nordic countries, there is a culture of offering individual workspace for all students. The costs for available space is a huge part of total costs and this culture makes it even higher. Thus the education-space must be useful in several different ways, to many different purposes.

Two parts can be observed in the design-reviews. The actual work done during the critics can be characterized as of two categories regarding the use of space, settings etc: Presentation and discussion. Presentation means the students presentation of their project and is a monologue. Discussion means the teachers comments and remarks on the presented projects, plus the discussion that may take part afterwards. We consider this a discussion in Swedish context, as it very often tends to be a discussion between the teacher and the student or students who are listening. In another context, for example in the southern parts of Europe, one may very well prefer to regard it as a monologue. These two, the presentation and the discussion, can also be seen as two different phases taking part after each other. When the teacher´s comments are not interrupted it may be seen as three phases – presentation, critics and discussion.

Teaching hours are limited and the use of time during design-reviews is important to get most results out of the time spent. Teachers and critics can support the process by presenting in advance a time-schedule for the crits and also by before-hand arranging the settings to ease movements and translations between different phases of the review.

Good organization makes the students more interested to stay and listen to other presentations and critics of other projects than their own ones, even after their presentation is finished. Organization in space and in time is most often related to each other. Organization is seen as going hand in hand with, and may be seen as a part of, the use of space (Worthington, 1998). Let us just look at one example that is most relevant for this study: To maximize the length of lessons to approximately 45 – 50 minutes, in order to enhance result of the ventilation system and at the same time adjust to the human brain, which cannot work in concentration for longer time than approximately 40 – 50 minutes.

The setting

Results from the video-recordings show examples of how the critics stay seated beside the screen, not using the pedagogical tools that they were used to in the poster based design-reviews. They are not pointing at important details and not using gestures to further explain.

One way of understanding a building is to regard the different layers, which constitutes the building. Steward Brand describes them as the 6 S: Site, structure … service and settings (Brand, 1994). Settings means what is loose in rooms and facilities, such as furniture, curtains etc. Settings are also the part that is easiest to change, and that makes the facility adapted to new or different purposes in the least costly way.

A large open space can work well for multiple concurrent teaching situations, for example, several critical reviews simultaneously. But that assumes that there is access to screens that can define and that there are staff who can help to arrange these. It also requires planning by the responsible teacher to get this in place in time.

Settings must be arranged in beforehand to invite the critics to take more active steps during the reviews. But settings in form of furniture must also be arranged to invite and to promote an active taking part from all students, not only the one whose project is discussed for the moment. Chairs can for example be places in a firm half-circle near the screen and all tables can be taken away.

The demands for multipurpose use of all special facilities are increasing, not only at schools of architecture, due to raising costs for rent and management of built space. Another reason for the interest of multipurpose use is the development of pedagogy where new methods for learning are introduced while the traditional special learning facilities no longer can fulfill their purpose. Learning facilities in general have a low degree of use over time. This fact makes it ever more important to work with the settings, to arrange and re-arrange furniture and equipments in order to design a suitable setting for each different educational situation.

Poster-based setups allows for both student and critics to go up and down between the different scales and also between different parts of the presentation.
Lymer also talks about the presentation being by nature a sequenced activity and that the students are required to prepare a sequential structure. (Lymer 2009-10, p. 10)
At a poster-based design-review the whole presentation, all the material of the students´ proposal, is present all the time. This way the critics are free to make their comments in whatever order they prefer. This makes the poster-based design-review more useful during the phase of the critics, which is also the very moment of assessment.

Until other technologies are introduced, the combination of the two setups, poster-based and by computer, a way of presenting that Lymer calls "the hybrid setup" (Lymer et al. 2009), can offer good conditions for the design-review as a whole.

Rolf Johansson and Sofia Sandqvist have done in-dept interviews with teachers in architectural education about the ´crit´ (Johansson & Sandqvist, 2009). Their results show that the physical setting is considered to be very important. There are two different demands on the setting that might be in conflict with each other; the need for an area undisturbed from other activities on one hand and the need to exhibit ongoing activities on the other.

This way you may achieve the advantages of both methods; the presentation can be done by the students in a professional way, and the critics are able to make comments using the whole material and pointing at different drawings on the paper-posters. In specific for small-scale design-reviews, such as examination of diploma-thesis. Then, if the audience consists of a few persons, you may have the posters in the form of a report on the table between you, after the students´ presentation, and you will have the material available for all, to discuss details in the design.

The distance to the presented visualizations must be short so all persons taking part have possibilities to hear and see the activities going on.
To enhance the intended dialogue between the student, the critics and the audience, the settings have to be arranged in such ways as
the critics, for example, must not turn their back towards the audience.

The arrangement of furniture etc is of great importance. The video-recording show differences in how active the other students, the audience, were depending in how the setting was arranged. In some of the recorded critic-sessions the room was arranged as a traditional lecture-room with tables and chairs in rows. Here you could see no activities from other students, while in other sessions a close circle of chairs were arranged around the presentations, and here other students took part – a dialogue was going on.

Findings

The main research-question of this research may then be answered by stating that space can support the pedagogical activities by offering places to do pedagogical work. The kind of aspects related to space that can facilitate the activities of the critics in architectural education are good condition concerning light, acoustics, ventilation and space enough.
The multi-purpose use of the space is necessary, as all facilities are limited and the range of different activities in architectural education, is high. As a result the adaptability of the actual spaces has to be

high, if the design-reviews shall also serve as a pedagogical moment in design-education. To obtain adaptability you can use for example screens and chairs that are easy to move.

All kinds of educational rooms in the Swedish context can be, and are in reality, used for design-reviews. They all fulfill the basic requirements concerning light, ventilation and sound- absorbents. But the possibilities to work without disturbance in the actual room or area, has to be regarded.

The ways of presenting the students proposals are partly predicting the type of room or space the design-review may take part in, but in general walls to hang up paper-copies are preferred, even if the presentations is made only by power-points.

The arrangement of settings is of huge importance for creating interacting situations, and for making a dialogue at all possible.
Teachers in the Swedish context are not always aware of the impact of settings and arrangement of furniture etc in beforehand, to ease for audience to actually see and take place in the design-reviews. The summative conclusion is thus, that with smaller preparations of the settings, suitable for each specific situation, the room for design-reviews I architecture schools in Sweden would improve and be able to satisfactory fulfill its purpose.

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