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Learning to see as an architect:

Actions and semiotic resources in critique sessions

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I would also like to show my appreciation to my friends if they were all mentioned by name would make this reading a long and dull experience who. Still I can not help giving an overdue regard to Niklas Pettersson who has been a good friend in good times as well as bad.

"No one looked at the subject from that point of view then,
but that's the truly humane point of view, I assure you."
Fyodor Dostoevsky
Crime & Punishment, part iv, chapter i.
Translated by Constance Garnett.

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Actions and semiotic resources in critique sessions

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Summary:

This study investigates so called critique sessions at a school of architecture. The questions addressed and answered in this study are: How are students and professionals interacting during a critique session? How are problems of understanding solved during a critique session? And, how can a 3D-model be used to present a project in a critique session?

The study has its foundation in the naturalistic tradition of studying talk-in-interaction and ethnomethodology. This foundation is represented mainly on the works by Charles Goodwin. The study makes use of video-recordings as a primary source where interaction and encompassing activities occur.

The analysis concerns the collaboration between students and professionals in the act of jointly making a city-planning project understandable by interaction done by a range of semiotic resources. This raises the question of how interaction is performed during critique sessions. In the first part of the study two-dimensional sequential pictures are used, and in the second part of the study the entering of a perspective is done by the use of a 3D-model. By using such a tool, actions take place inside a virtually constructed spatial context. The study investigates how moving about inside such a closed space is performed, and how pointing is done within the space.

The results of the study are discussed in relation to the theoretical framework of the study. Questions debated about in the discussion are how a perspective can be used to facilitate understanding, in what way problems are solved during critique sessions and how a 3D-tool can be used to present a project during a critique session. This is then related to how this

technology can be utilized in presentation of projects and how the results relate to professional vision.

Keywords: 3D-models, talk-in-interaction, perspective, collaboration, professional vision, ethnomethodology, video analysis.

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1 Introduction

Learning to 'see' from a certain perspective enables you to be able to understand the world from that perspective later on in life. The way of seeing can be a new way, as when a certain profession is learned. In this study I will show how architect students learn to become professionals by being educated in how to use talk and tools providing such a perspective. The students respectively use the perspectives of a car driving through an area and a pedestrian walking. These perspectives are utilized to make a representation of a projected area in a city understandable during a critique session. In the later part of this study the perspective will be maintainable through the use of a modern tool in the form of a 3D-model. This model makes it possible to experience the city space as if it already exists.

The critique session is a situation where human behaviour comes to light as situated activities. This study analyses human behaviour as situated activities and in what way these activities can be said to be a way of seeing as a professional. Situated activities are thereby investigated as to how they are relevant for students who are to become experts in a profession. The audience of critique sessions consists of teachers, experts and fellow students (further elaboration of the premises of a session is found in section 2.4 of this study). Both of the two students succeed in conveying their design of the area to the audience. This is achieved by the helping instructions of teachers and fellow students in the audience.

Instead of addressing 'vision' as something placed inside the head of someone, this study supports the position that vision is something that can be experienced by many at the same time. The collaborative setting of critique sessions provides the possibility for all present in the audience to take part of the educational instructions. Thereby the study is uncovering and explicating the methods and resources by which students learn to become part of a professional community. The investigation is done by analysing the students' and professionals' multimodal interaction and encompassing activities as they jointly make a city planning project understandable by the use of a 3D-tool.

Research addressing higher education, which is the case in this study of architectural students at the university level, actions can not be regarded as isolated incidents. Instead actions have to be regarded in the light of what the actions are a part of, namely the larger activity

(Goodwin, 2003). This study will analyse the way in which actions are related to the larger activities, thereby making it possible to 'see' a project with an architect's eyes.

2 Analytical approach

In this section the analytical approach of the study will be focused upon. The main points of this section are to introduce how critiques historically have been studied and what professional vision is. Since this study analyses talk in interaction this is brought up in regards to conversation analysis and ethnomethodology which at the moment is one of the ways used to analyse talk in interaction.

2.1 Analytical framework

The aim of this study is to investigate human behaviour as a social accomplishment. Investigating can be done by relating different means of encompassing human activities to each other. This study shares the position that action, cognition and language are to be seen as situated practices which are specified by Goodwin (2003). There action, cognition and language are said to have its primordial site in a "situation in which multiple participants are attempting to carry out courses of action in concert with each other through talk, while attending to both the larger activities that their current actions are embedded within, and relevant phenomena in their surround" (Goodwin, 2000, p. 1492). In this approach human interaction is under study, and finding out how talk and actions relate to each other is of importance for understanding interaction. Exploring the actions and the relevant details in the surround in relation to a larger context makes it possible to uncover the occurrences of a situation. The larger context being the session in which the actions performed take place.

The present study makes use of the naturalistic inquiry of praxeological studies of classroom interaction. A field whose tradition has been described by Macbeth (2003). The naturalistic tradition has a background in ethnomethodology and conversation analysis. The naturalistic approach has contributed to a more open, public and reachable approach to how competences and skills in classrooms are conceived. Instead of focusing on collecting material after the actions have taken place in which the students and teachers are asked about their experiences of the critique session, this approach investigates how the session evolves as an ongoing joint activity, collecting material during the actual session.

Charles Goodwin, representing this ethnomethodological (Garfinkel, 1967, 2002; Livingston, 1987) approach is utilized together with conversation analysis (Sacks, 1992; Schegloff, 2007) in seeing actions as social and practical accomplishments. Since the material under scrutiny in this study is talk-in-interaction (Goodwin, 2003) the unit of analysis is the situated activity system (Goffman, 1961; Goodwin, 1996b; Goodwin & Goodwin, 1987).

Goodwin (2003, p. 225) gives an example of how the situated activity system can be used:

> …a concurrent assessment (e.g., two participants simultaneously evaluating something through both overlapping talk and visible embodied displays of affect and appreciation…) integrates into a common course of action syntactic and semantic structure, intonation, gesture, participation frameworks and inferential processes projecting events which haven't actually occurred yet, into a common course of interactively sustained action.

Goodwin's position is that human actions are possible to understand during the actual act of interacting also states that people are acting together in joint actions to reach results with the help of a range of different syntactic and semiotic resources. The same approach is utilized in this study.

2.2 Social actions

In this study, the position that action and talk are closely related is a premise. Within situated interaction the construction of action through talk is accomplished through the temporal juxtaposition (Goodwin, 2003) of very different kinds of semiotic resources.

According to Goodwin (2000, p. 1489) "material structure in the surround such as graphic fields of various types can provide semiotic structure without which the constitution of particular kinds of action being invoked through talk would be impossible". Actions are thereby dependent on the graphic field that is provided by the situation within which the actions are performed.

> The accomplishment of particular concrete actions requires that these structures be deployed in conjunction with other relevant meaning-making practices, such as the game-relevant body of an actor jumping through the hopscotch grid, pointing elaborated by relevant talk… (Goodwin, 2000, p. 1516)

The graphic field of a hopscotch grid provides a framework for the actions where the actions become meaningful. In that way the environment can put up the realms which by necessity have to be taken into account when interacting, as when taking part in a game or participating

in the joint venture of trying to understand a project by the use of a 3D model. Actions can not be understood only as isolated events unconnected to each other and other semiotic resources.

How the boundaries are related to human activity is illustrated by Goodwin (ibid.) studying girls playing hopscotch. When playing hopscotch the participants react by talk and pointing upon whether a participant has landed her foot within the line of the grid or not. Thereby displaying how the graphic field is connected to other semiotic resources such as talk and bodily motion such as pointing. In another example Goodwin (ibid.) brings up a tool called the Munsell colour chart, which is utilized by archaeologists trying to identify the colour of the dirt they have uncovered while excavating a site. This is a tool that helps archaeologists determine the colour of a spot of dirt and helps classifying the colour. The Munsell chart is not solely a representation of categories of colour, but it is also "a space designed for the ongoing production of particular kinds of *action*", as Goodwin (2000, p. 1516) puts it. The chart works as a classification schema of how to look at a colour.

The Munsell colour chart is thereby a tool designed for the purpose of archaeologists comparing findings by the use of a colour classification schema. The tool makes it possible for researchers to trade experiences with each other. Hence the tool helps the organisation of the cultural historical knowledge of the profession.

In the use of the Munsell chart, as well as a hopscotch grid, humans organize their actions. This makes it possible for others present as well as the person performing an action to "be able to systematically recognize the shape and character of what is occurring" (Goodwin, 2000, p. 1491). These properties are what a social action is made up of.

2.3 Professional vision

Investigating how learning is accomplished is not a trivial task. The concept of professional vision brought about by Goodwin (1994) as a way to investigate how professionals analyse actions can be used to facilitate this task. In the present study vision is approached as "a set of socially situated, historically constituted body of practices" (Goodwin, 1994, p. 186). Taking such a position, previous studies have investigated how specialized terminology and specific forms of a subject are used by professionals of a trade and then passed down to newcomers to the subject (Grasseni, 2004), and how an understanding of the specialized categories of a

discipline is apprehended by the application of them in specific instances for specific purposes (Lindwall, 2008).

Phillabaum (2005) has defined language as only one of many semiotic resources: "While language is the most powerful means of semiotic expression available to humans, it alone cannot account for the complex learning that occurs in professional communities" (ibid. p. 171). Phillabaum, who has studied professional vision in educational settings in the form of photography education, shows how students in a photo studio are taught the "skills for making technically informed judgements about work as well as the specific language practices for doing so" (Phillabaum, 2005, p. 160). The students learn this by trying to find the right term to employ to the colour balance of their photographs and how they in this process are guided by their instructors whom elaborates and calibrates the students' visual and discursive competences. Even though this setting is quite similar to the study of architectural critique there are differences. One difference lies in the fact that architects can make changes to their work before the product is actually finalized. Language and other semiotic resources are used by the students in their presentation to give the others the opportunity to try to understand the unfinished and tentative project. This makes the use of language in an architectural critique more exposed and dependent on the semiotic resources utilized by the designer of the project. Therefore it is not only of importance to learn the correct terms, but also to learn to be consistent in the use of the language practices of architects.

Another statement made by Phillabaum (2005) is that more investigation is needed in the study of how meaning making as a multimodal activity occurs in professional communities: "future investigations into professional learning and professional vision would benefit by employing an approach that examines meaning-making as a multimodal activity involving talk, the body and interaction with the material world" (ibid. p. 171). This approach is in line with what Goodwin (1994) stated about seeing as a joint activity, a practice that is socially situated and enjoyed with others. It can be said that 'seeing' as a professional is to become a member of a community of practice, and becoming a member of a community of practice by learning to 'see' as a professional can be done jointly.

2.4 Ways of studying critique sessions

Maybe the most common way of studying critiques has been the social psychological aspect. These studies are addressing the critique session as an event that stirs up strong emotions. Among these studies is Anthony's (1987) who found that students have a tendency to be nervous and defensive in their attitude toward critiques. Webster (2005; 2006) found that critiques can be experienced as a frightening event where reproduction of the teachers ideas were appreciated more than the students' own creativity.

Communication has also been investigated with regards to design disciplines, Morton and O'Brian (2005) lifted the communicative issues of design and studied these. Their study compared two different models for how oral communication can be looked at in pedagogy. Oak (2000) outlines an overview of how the debate between "art" and "industry" in design education is shaped, by showing the exchange between free-artistic expression and how the end-user demands usability from the product. The latter study was done in a way inspired by conversation analysis which focuses on the analysis of the gestures, talk and embodied actions. That is more related to the approach in this essay where social actions are examined as practical accomplishments.

During the critique sessions included in this study a specialized language is used by the teachers as well as the students. Therefore this study discusses how such a specialized language is learned during critique sessions. This is done by investigating how different types of talk and characterizations (Hindmarsh & Heath, 2000) are used together with the graphic field and other semiotic and syntactic resources. These resources include the trade specific tools which the projects are presented with during the sessions. To make the projects understandable, uses of these resources also have to be learned. Having knowledge about how to use the trade specific tools becomes of importance especially in the second of the two presentations under scrutiny, because it is with the help of the tools the project becomes understandable. Thereby it becomes a relevant feature for how seeing as an architect is possible during a critique session.

The setting of a critique session utilized at the schools of architecture is a collaborative setting in which students are to gain knowledge of what it means to be a professional architect. "The creation of a learning environment where multiple experts are present and where students must constantly interact with each other in joint problem solving provides a powerful model

for education that we would benefit from examining" (Phillabaum 2005 p. 171). This is well put with regards to what is studied here, where students and teachers have the opportunity to learn from each other and joint problems must be solved, to enable the skill of seeing as an architect. This has similarities with how students are guided to use different means of presentation to facilitate the task at hand in Bergqvist and Säljö (1997), even though that particular study regards students in natural science.

3 Research questions

In the description of the course of architecture at a school of architecture, how to 'see as an architect' is in focus. Therefore it is relevant to examine how this requirement is met in the widely used critique sessions, which is a common way of assessing students' performances during the courses of architecture in the Western World. This study investigates how talk-in-interaction evolves during a critique session and how different tools of the trade make it possible to 'see' as an architect. The questions addressed in this study are:

- How are students and critics interacting during a critique session?
- Which semiotic resources are used by students and critics in establishing mutual understanding?
- How can different technologies contribute to establishing specific ways of professional vision during critique sessions?

The results are related to the professional vision of architects. Looking at questions about in what way professional vision is of importance to education as a subject by relating it to how someone becomes a more competent member of a community of knowledge (Phillabaum, 2005).

4 Research context

This episode brings up two aspects of this study: firstly, what goals are specified by the staff of the architectural programme. In the folder presenting the program at the academy, seeing as an architect is specified as important for the students to learn.[1] Secondly, the method used in

[1] The part 4.1 is based on a presentation folder of the architectural program at Chalmers School of Architecture (05/23/2008)

the study is addressed. The method is the investigation of talk in interaction which is carried out using video recordings of actual ongoing conversations, in which students are trying to make their projects understandable during a critique session.

4.1 The empirical base

At the school of architecture every student takes part in at least fourteen design reviews throughout their study-time before their diploma-work is presented; two in the first year and four in each of the following three years. As in most of the Western World the education is based on projects. The projects are evaluated in what is called "design reviews" or "critiques". When the design reviews are about to take place, the projects are hung on a wall or exposed by a computer projector and the group of students and teachers/professionals are gathered. A short presentation takes place giving the students the opportunity to present their projects one at a time, and the teacher or professional architect provides comments on what he/she values, what could have been better performed etc. Among the aspects they judge are the techniques used to build by, and how to use the city area once built. Students as well as teachers comment on the projects. The academy regards this process as an important pedagogical method.

The centrality of professional vision as a theoretical notion at the academy can be illustrated using a citation from the official documents presenting the architectural education to present and future students: "an important part of your development is to learn to see with 'the eyes of an architect' to perceive the qualities of buildings and physical environments that have an impact on aesthetic expression and function"[2].

Another step in the educational process of an architect at the academy is to learn how to use computer programs such as Architectural Desktop and AutoDesk WIZ, and to learn how to draw city plans and interiors with such programs as tools. Students are to use the 3D-model in the formulation of their projects and integrate these in the presentation if necessary.

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http://www.chalmers.se/sections/ar_student/programhemsidor/arkitektur_180_200_p/downloadFile/attachedFile_f0/Arkitekturprogrammet_-_folder?nocache=1177919295.71

[2] Translated from presentation folder of the architectural program at Chalmers School of Architecture (05/23/2008): http://www.chalmers.se/sections/ar_student/programhemsidor/arkitektur_180_200_p/downloadFile/attachedFile_f0/Arkitekturprogrammet_-_folder?nocache=1177919295.71

The practical reflections an architect is concerned with are of a complex art according to the presentation folder. Students who want to become true architects must be able to create meeting places for end-users, and make it into a pleasant environment. The area is to be created in an artistic way which still has to be practicable taking technical and economical considerations as well. The aim of the education is to teach a method that takes these aspects into consideration. It would not do with a project that is affordable but boring and uninviting. Nor would a city area impossible to move around in be desirable, and if an area is to be interesting, the architect has to make it possible to use the area for many different purposes. An important focus for an architect is thereby the end-user of the area.

The architect's role in this study is to design an area to be used by an end-user. In order to be able to see the area from the end-user perspective, it is of important to know what features are relevant to focus on. To see from a perspective thereby becomes to see as a professional architect. An architect is not only to facilitate for fellow architects to understand the project, but also to facilitate for anyone who could be regarded as an end-user to get an understanding of the project. Thereby the concept "end-user" has a multiple meaning connected to it. It becomes relevant to ask who the end-user is. Often during critique sessions the experts argue that the project under review is missing something. But what is missing is not necessarily specified, and for whom it is missing is not necessarily elaborated further either. By the use of a trade specific language about what is missing a professional architect might be seen as the end-user. But city areas are utilized by others as well, so the end-user could very well be seen as anyone moving about in the area. Thereby the end-user has dual layers of meaning, one layer being the professional, another the general user of the area. Therefore when the trained architect comments that something is missing it is not necessarily so that he is the one missing the feature, but he might as well believe that this feature would be missing for someone else. The area makes use of the "end-user" concept to make it possible to illustrate problems, e.g. how to create meeting places or how to move about in the area.

4.2 Data collection

This study is examining video recordings of talk in interaction during critique sessions. Included in the study are master students who have been given a project to architecturally create a city area in a central part of a town. The critique session is a situation in which different tools specific for the architectural trade are used. This study analyses human activity during two separate critique sessions. In the first session the student makes use of a two-

dimensional plan to convey his architectural project. In the second session a student makes use of a three-dimensional plan to convey his architectural project. The activity taking place during the sessions is one of many "complex, multiactor, technology-mediated work settings and learning environments" (Jordan & Henderson, 1995, p. 79) which are hard to study. But the use of video recordings helps this situation by being "a powerful tool in the investigation of human activity" (Jordan & Henderson, 1995, p. 79).

The material used in this study is from a vast audio-visual material, consisting of video recordings of critique sessions. I did not have the opportunity to be present at the time the material was collected. There are problems with not having been present when the video material was recorded. For example, occurrences of relevance for the unfolding of the activities may have taken place outside the frame of the camera (Jordan & Henderson, 1995). Someone who was not present when the material was recorded is obviously oblivious to such occurrences. This loss of information may lead to problems of understanding the context of the critique session with regards to how events in the room where the session takes place affect the presentation. As the analyst I have compensated for this by having continual contact with the researchers who collected the material, and by asking them questions about occurrences outside the frame of the camera. Not being present at the time of the recordings also made it necessary for me as an analyst to focus even more upon how the relevant features within the realms of what was captured on camera were used. The main goal of the study is also to investigate how the actual ongoing processes of critique sessions are unfolding, and not having been present while the material was collected does not necessarily have a negative effect on this goal.

Another problem for me as an analyst has been that I am not a professional architect myself. This fact separates me from experts in the field, who are able to accurately determine which features and what language used by students and teachers alike are of relevance for architects. Another type of context is also lost, to someone who is not an architect i.e. how architects experience a city area. However having access to books and other literature, such as the program folder, has made it possible for me to get a partial, yet useful, insight into some of the features relevant to the profession.

On a positive note, using video recordings to collect material is a method which loses less data than other means of collection. Jordan and Henderson (1995), in the same passage as the

citation above, concludes that: “video loses less, and loses less seriously, than other kind of data collection”. The positive effects of using video recordings can be further strengthened by what Heath (1997) states about video recordings providing a unique access to social activities. Using video recordings also provides the researcher with the possibility to investigate talk as well as gestures and the use of different objects in the surround (Heath & Hindmarsh, 2002). The studying of actual interaction also has advantages in respect of professional vision because, as Phillabaum (2005) calls attention to: it is through the study of ongoing interaction that it is possible to explore “the linguistic and embodied practices involved in the development of the professional vision” (p. 148).

The material from which the two presentations included in this study were chosen was vast. The sequences under scrutiny were chosen because a perspective was used to make understanding of the projects possible by the use of the end-user perspective. There were other examples of how understanding projects was reached in this vast material as well. So when utilizing only few examples of how understanding is achieved it is of importance to point out that this might not be representative to how understanding is constituted per se. These other examples might contribute to the understanding of what professional vision of architects is as well. But how understanding may be reached and how semiotic resources may be utilized to reach this understanding is possible to read out even from just a few short excerpts, as those chosen to be included in this study.

The material has been transcribed by the use of the program InqScribe. The process of transcribing material has complications connected to it as well, one of these are “some loss of information in relation to the event it captures” (Jordan and Henderson 1995, p. 53). On the other hand transcribing makes it easier to get an overview of the content of the video material. In a first rough transcription of the material different parts seen as being of greater relevance for the study were marked. Later these relevant parts were transcribed more thoroughly.

The excerpts were transcribed using a form influenced by conversation analysis (see e.g. Hutchby & Wooffitt, 1998; Jefferson, 1984). The numbers in brackets stand for how many seconds pauses last, “(.)” indicating a pause no longer than a single second. Square brackets are used to mark the beginning of overlap of simultaneously occurring talk, the simultaneously occurring talk is also horizontally aligned. Colons, for example “e:::::h” are used to mark the prolongment of sounds. If talk is made in a laughing tone asterisks (*) are

enclosing the sequence. Comments in italicized letters inside double parentheses are extra-linguistic actions. Finally pictures with illustrative attributes of the student pointing during the ongoing talk are complementing the excerpts.

4.3 Ethical considerations

The ethnographical character of this study calls for ethical considerations during the collection of the material, as well as when handling the material. The teachers and students alike have been informed about the project the material was collected for.[3] There is also a general will at the architectural academy to form the critique sessions in a pedagogical manner. It is the ambition of this study to contribute to the sessions as a pedagogical tool, therefore the comments should not be considered as evaluations of the performances of the individual participants of the sessions. Instead the object of the study is to analyse critique sessions as events to make them a more efficient pedagogical tool.

As noted above, the primary source for collection of the material is video recordings. This could cause concerns amongst the participants because their identities could easily be revealed. Therefore the students and teachers appearing in the material are not mentioned by their real names. In choosing the figures included in this study, have also made sure that features or characterizations that could reveal the identity of the participants are not visible. This has been done to let the participants remain anonymous. All of the participants have given their consent to the recording of the sessions and the use of the recordings for scientific purposes.

5 Results

In this section of the study the empirical material is analysed. The material is of critique sessions in which a "hybrid" (Lymer, Ivarsson, & Lindwall, submitted) between different technologies is used presenting the material. The hybrid setup consists of a mixture of posters and different projector-screen technologies. The audience switches their attention back and forth between the screen and the posters.

[3] The material is part of an ongoing project at the Faculty of Education at the University of Gothenburg. It is thereby not only used as material for this study, but also used in other scientific and educational contexts at the faculty. Therefore I can not vouch for the process of collecting the material, but as far as I am informed this is how the process has been done.

There are other ways of organizing the review sessions as well. The traditional setup is a poster-based setup where the audience attention is towards two-dimensional posters hung side by side. In the projector-and-screen setup students utilize slides exclusively to present their projects. The latter sometimes also includes models as a part of the presentation.

The first two excerpts (sections 5.1 and 5.2) are from a critique session where the student whom I have chosen to call Eric, is making use of a traditional two-dimensional plan to convey his idea of how he would like the city-area to appear in the future. These excerpts are included in the study to show how characterizations in the form of colours may be used. These excerpts thereby also display how the adoption of a perspective may facilitate the understanding of a project.

Before a perspective is possible to enter in the second presentation, an excerpt demonstrating how an idea to make use of a 3D-model is collaboratively created during a critique session (section 5.3), thereby revealing one of the characteristics of critique sessions. In the very end of this section a short excerpt shows how the teacher is recognizing that the use of the 3D-model was a good tool.

After this excerpt two short excerpts follow which illustrate how a 3D-model may be used during a critique session (sections 5.4 and 5.5). Here the use of a perspective to facilitate understanding of a project will be of essence for the audience to be able to grasp the project, as in the first two excerpts described above.

5.1 The difficulty of colour characterizations

In the following excerpt, Eric, a master student at the program for architecture is trying to give an appropriate description of a city area he has produced as a project. This is done by presenting his posters and power point projections in front of an audience consisting of fellow students, teachers and experts in the field of study. Figure 1 below shows the ground plan which is the main focus of this part of the presentation. Eric's ground plan of the area consists of small squares connected by a winding road which leads through the center, down to the marina which is at the top left corner of the plan (see for example figure 1). Some 15 minutes into the critique session, Eric is describing where cars are allowed to drive and where

pedestrians are able to walk in the area. But he has trouble describing the different colour characterizations in the plan.

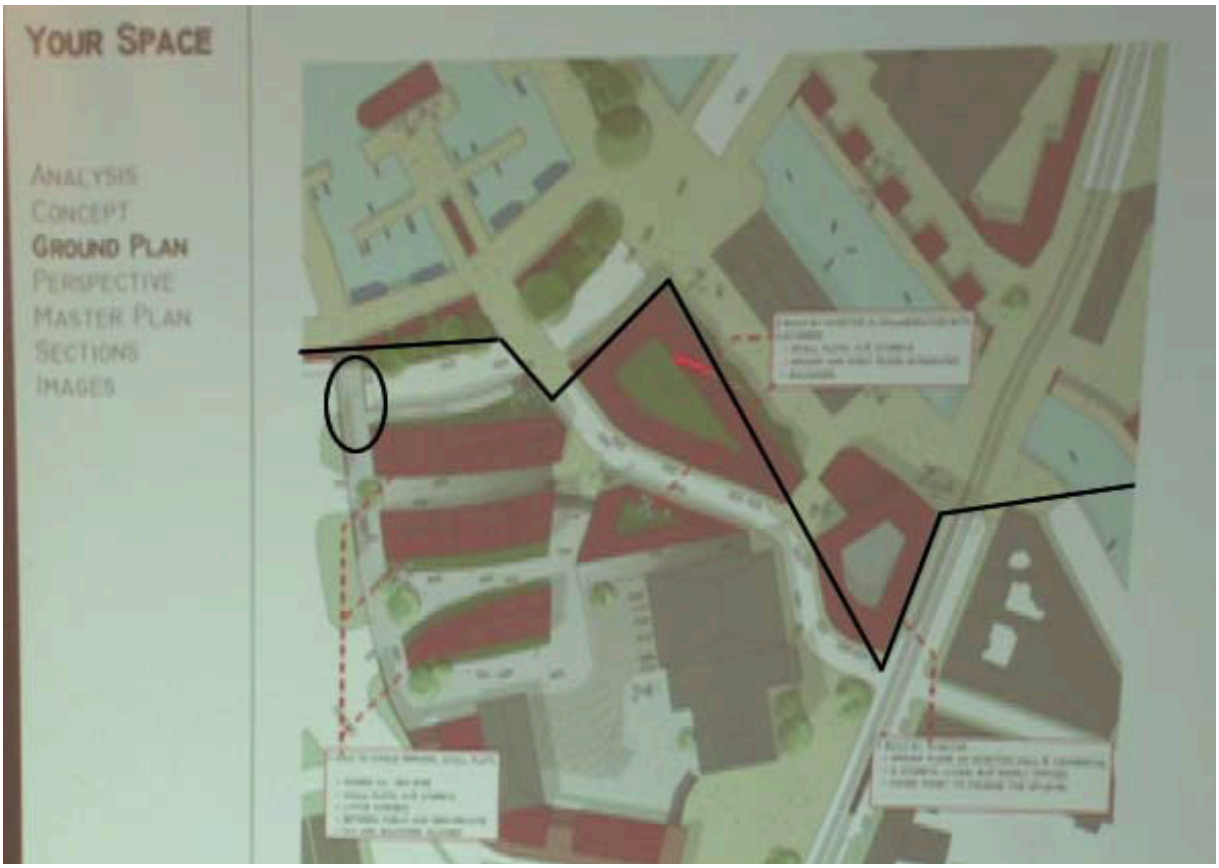

Figure 1
The grey area referred to in line 214 and 218 is below the line stretching across the whole picture from left to right. The laser-beam used to point with by the student can be seen as a little red dot in the middle of the screen.

Excerpt 1

210	Eric	I don't know where a lot of things can happen (.) here we have buildings
211		((*pointing generally to the red parts of the plan*)) so and now (1) I::
212		this is the streets going through here ((*pointing with laser along the*
213		*winding street going from the bottom right corner of the plan up to the*
214		*marina in the top left corner of the plan*)) this grey parts ((*pointing with*
215		*a bordering motion along an imaginary line that separates a more grey*
216		*part of the plan from a whiter, drawn as a line in figure 1*)) is kind of one
217		surface in a way I haven't decided really probably it is changing a bit but
218		it is a pedestrianized area is this grey ones (.) ((*again outlining the grey*
219		*area with the laser pointer*)) here ((*pointing with laser at a grey area just*
220		*below the black line in the top left corner, circled in figure 1*)) is a little
221		bridge going over (.) the streets and the cars are able to drive along here
222		((*moving the laser pointer over the projection*)) and they are allowed to
223		drive along here and they are allowed to drive here actually everywhere a
224		this (.) e:::hm okay (.) my building is here ((*pointing with laser to one of*

225 *the read areas in the plan*)) here we have a little green barrier coming to
226 the water with houseboats as well…

As is evident by the excerpt Eric has not yet finalized the details of the plan and he is not certain about how he wants the area to appear when it is finalized. Eric is trying to explain his own colouring of what he calls the "surface", but he is not sure how it ought to be in the end himself, as can be seen by his statement "I haven't decided really probably it is changing a bit", in line 217.

In the same segment Eric uses a characterization (Hindmarsh & Heath, 2000), in this case with the use of a colour to describe the surface of the ground. This can be seen in lines 214-217 where Eric states that "this grey parts is kind of one surface". What kind of "surface", or building-material used, is of cultural relevance (Phillabaum, 2005) for architects. After this in line 218 Eric's statement "it is a pedestrianized area this grey ones" contains the deictic (Goodwin, 2003) term "this" which makes it possible to recognize his pointing, this is said together with a colour characterization of the area. This area he specifies as "pedestrianized". This can be called an "action characterization" of an area, which is specifying what acts are possible and allowed to perform in the area. To know what actions are possible in an area is also something that is of cultural relevance for architects. It is thereby possible to conclude that Eric uses the same colour characterization to refer to two different features that are of relevance for architects.

Having two different meanings of the colour characterizations is confusing for experts in the field of architecture. It is confucing because it is of importance how the area is possible to use, as well as what materials are used to build the area. The more details the student brings forward as relevant for how the project is designed the harder it becomes to understand. By explaining the graphic field with the help of semiotic resources, which Eric does, it ought to become easier to understand, but this is not the case. For the plan to be easier to understand Eric has to learn how to use colours as characterizations which he later in the critique session gets the opportunity to do.

Comparing Eric's statements brought forward above, there is a difference between the characterizations but it is not clear what the difference makes a difference for, to use Bateson's (1972) formulation. There is a conflict arising between different semantical

meanings of a sign in the graphic field. It becomes questionable if the colourings are there because different types of material are used as ground or if it is there because certain actions are allowed or prohibited. Both meanings are of cultural relevance for architects. It is possible to identify a clash of two parts of the professional vision for architects. It has become a hard task for a trained architect to make out what is what without additional information.

That there is a conflict of different semantical meanings of the characteristics is something laymen maybe would not consider as something worth focusing upon. A trained architect though, as is evident in the next excerpt, is able to make this difficulty out of its surrounding semiotics and understand that it is worth focusing upon.

5.2 Learning to explain characterizations by the use of an end-user perspective

Following is an excerpt from later on in the same critique as above. It is collected from when the presentation is finished and the questions and comments are well on its way. In the segment the discussion comes back to what actions are possible to be taken in the area. The students and teachers present have the same problems understanding the colour characterizations as Eric had himself when presenting the project in the former excerpt.

In their joint attempt to understand the plan they all are trying to make use of the different characterizations as well as the placement of a car in the plan. The person called Martin[4] is trying to understand where cars are allowed to drive and where it is not even possible to drive. By asking these questions he tries to get an understanding of the project from within a perspective thereby also revealing what the different colours characterize. This will show how a perspective can be used to be able to 'see' as an architect and in what way language practices used in the profession can be learned during critique sessions.

The three figures below show the same ground plan as in the former segment of the study, and are duplicated to make it easier to distinguish the different illustrations from each other.

[4] If the person I have chosen to call Martin is a teacher or an out of school expert of the trade is hard to be certain of from viewing the material. I have therefore for reading purposes chosen to call him "Martin" or "the teacher" through this whole study.

Figure 2
This figure is displaying the winding road between point A and B, and the corner C.

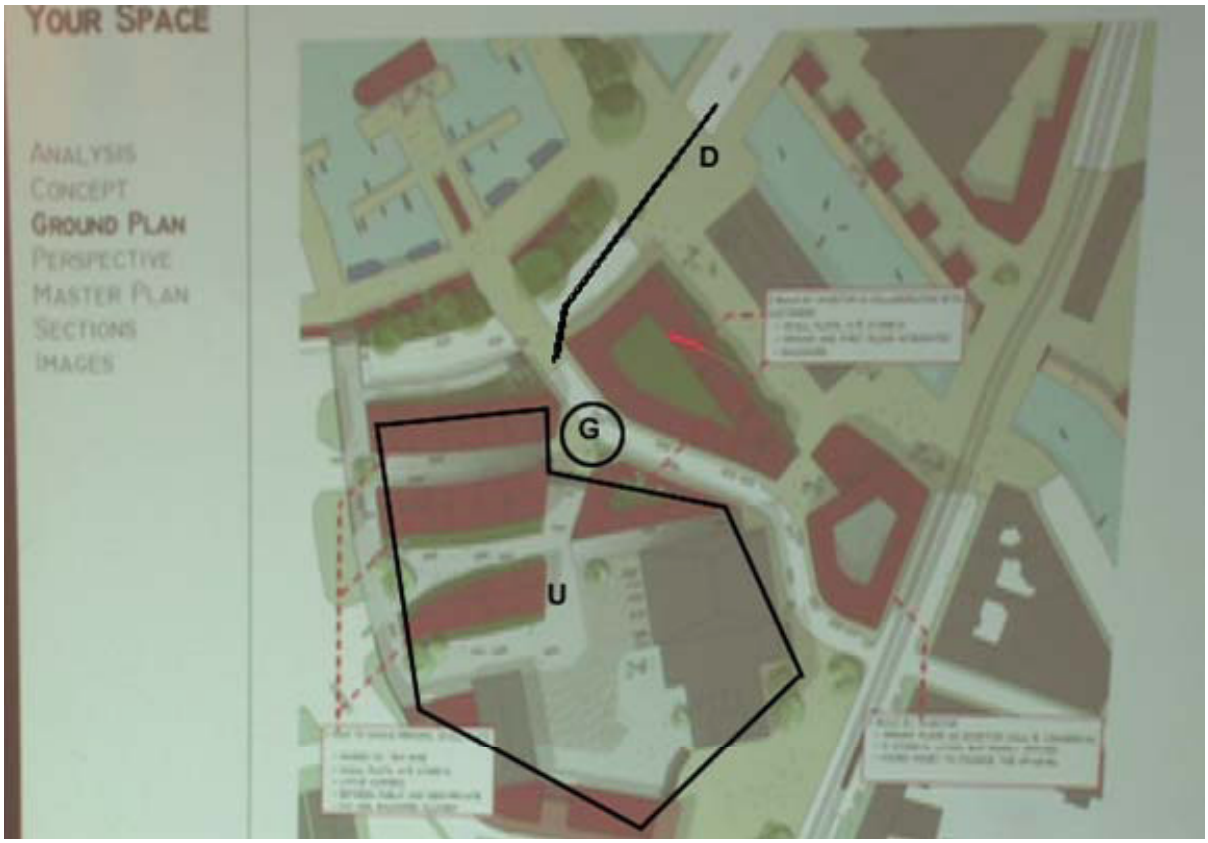

Figure 3
The area one level up is enclosed with a line and named U. The students pointing to the ground level in line 567 is outlined with a circle and named G. Finally the line named D is where the student points to where cars can "just drive up" in line 568.

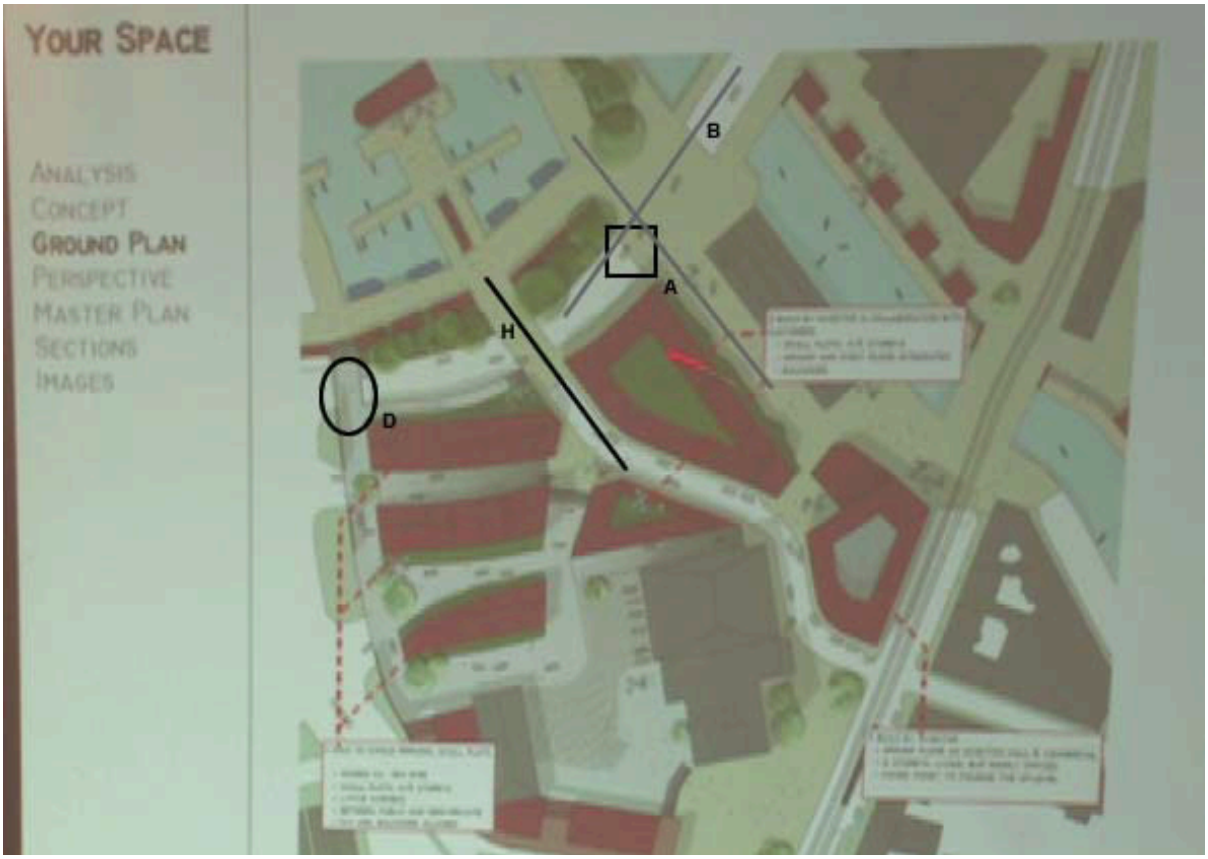

Figure 4
Here the different colourings and different levels are continuously explained by the student And the plan is becoming easier for the audience members to understand.

Excerpt 2

544	Eric	here it becomes quite narrow and the little square again and narrow, little
545		square and then coming out to the marina so this is the way ((*Eric is here*
546		*following the winding road from point A to point B seen in figure 2*))
547	Martin	those that goes go through here right there where does it land, does it land in
548		the marina (.) or can it turn left or right somewhere (.) or is it a dead end
549	Eric	I mean for me I (.) I take this ((*pointing to the middle of the plan, in the*
550		*center*
551		*between the A and B in figure 2*)) as actually the center point (.) so (.) so
552		to speak this ((*pointing with laser to the same road as above*)) is the centre
553		so every street here is entrances in getting in the domestic area so: what do
554		you mean by dead end?
555	Lisa	((*laughter*))
556	Martin	dead end
557	Mary	it's the same question that I asked you are you
558	Eric	ah, you mean here ((*sweeping the laser pointer around the corner named C in*
559		*figure 2*))
560	Martin	Yes ((*nodding his head*)) it can? ((*nodding his head*))
561	Eric	Yeah allowed to (.) cars are allowed to drive in this grey (.) area ((*pointing to*
562		*all the grey area in the plan, below the line in figure 1 in the first excerpt*))
563	Martin	okay
564	Eric	cars are allowed to [drive

565 Martin [that is one level up?
566 Eric this one is one level up, this here up to this edge ((*outlining the area named U*
567 *in figure 3 with the laser pointer*)) and this one is ground level ((*circling*
568 *the area named G in figure 3*)) over here they drive just up ((*moving the*
569 *laser pointer over the surface from the road up to the top right corner, line*
570 *named D in figure 3*)) this is not bordered ((*pointing to the border where the*
571 *colour shifts in the square marked with an A in figure 4*)) that's why I
572 placed the car on the edge
573 Martin aha
574 Eric yeah this is one surface but different flooring ((*pointing to the thin lines called*
575 *B in figure 4*)) (.) to show this is a pedestrian crossing ((*pointing along the*
576 *line named H in figure 4*)) that's why this floor is the same as here ((*pointing*
577 *the endings of the line named H in figure 4*))
578 Martin aha that is the same level
579 Eric yea same level but just (.) here here (.) this one is in fact ((*pointing to the area*
580 circled and named D in figure 4))
581 the first one
582 Martin yeah, starting from level two
583 Eric yea
584 Martin key

In lines 547-548 in the above excerpt, the teacher Martin is asking if the winding road leading up to the marina is a dead end. Doing this he is trying to understand the plan by the use of a specific activity (Goodwin, 2000), that of driving a car inside the area. Martin asks if it is possible to drive of the road to the right or to the left. The teacher is not able to judge if it is possible to drive a car off of the road by the information given to him by the graphic field. Since Eric has been unspecific during his explanation of the characterizations earlier, as could be seen in the former excerpt the teacher has not been helped by Eric's talk either.

Eric is trying to understand what the teacher means by the statement about a dead end. But he does not understand the teacher's question, which can be seen by Eric asking the teacher what he means by "dead end" (lines 553-554). The student does not understand how an answer to the question placed by the teacher Martin can give meaningful information (Goodwin, 1994), which is a complex task (Phillabaum, 2005). But since the examinations of the architectural school is in the form of a critique session Eric has the opportunity both to get to hear the question of the teacher *and* place a question in return when he does not understand. This possibility makes it possible for Eric to learn how to use colours according to the language practice of architects.

The communication is at a rather fragile point here (lines 553-554) where no one seems to understand the other. The communication difficulties come about because the student has not been successful in explaining the consistency of the characterizations to the teacher. This difficulty of communication is noticed by Lisa, a fellow student to Eric who gives up a short laughter in line 555. The teacher repeats his wondering by saying "dead end" again in line 556, and other fellow onlookers are trying to clarify the query by pointing and bringing up questions they had themselves earlier on in the critique (line 557). And suddenly Eric reacts (line 558) and points with his laser to a difference in colouring in connection to a corner (C in figure 2).

In line 561, Eric forgets to state that he has started to explain the plan from the perspective of a car driver by leaving it out saying: "yeah allowed to", but then he notices this and starts over, this time including the car in the statement: "cars are allowed to drive in this grey (.) area", in the same line. He clarifies that cars are allowed to drive in the grey area by pointing out the perimeters of where cars can drive with his laser pointer in line 561. This is done by using a combination of both iconic (by outlining the area) and deictic (by the use of the word "this") components in his pointing (Goodwin, 2003). Explaining the plan from where cars are able to drive, makes it evident that Eric steps into the perspective of how it would be to drive a car in the area. Driving a car is the activity since it gives the others a chance to 'see' the plan from within that perspective. The teacher cuts Eric of in line 565 to ask if it is possible to drive a car of the winding road to the left, thereby continuing the use of driving a car as the perspective.

The teacher accepts that cars are allowed within the grey area by his "okay" in line 563, but he is still wondering about the use of the different colours as characterizations within the plan, the grey colour is not the only difference of colours in the plan. He formulates a new question and asks in line 565 if a part of the area is one level up. This area being the one Eric by an iconic pointing already has started outlining (area U in figure 3). The teacher's question is placed when the student's laser pointer is at the exact spot the teacher is wondering about, not hesitating for a moment to interrupt the student to be able to time his question right.[5] The student restarts his iconic pointing marking the boarders of the difference of height in line 566. This difference of height is only consistent with a difference in colouring of the plan at

[5] For more on timing of gestures see for example (Koschmann, LeBaron, Goodwin, Zemel, & Dunnington, 2007).

some points, as can be seen in figure 3 where the white parts is not included in the iconic outlining of the area marked U.

From the last excerpt together with the teacher's questions it has become evident that the characterizations of colours in the plan are not consistent. This is needed for the characterizations to be understood since it otherwise is possible to interpret the colours differently at different times. The characterizations with the use of colours do not have the consistency of the Munsell chart (Goodwin, 1996a, 2000). That is why the trained architect has problems to recognize how it would be to drive a car in the area. Since the colours are not used consistently it proves that the student has not understood the specific language practice (Phillabaum, 2005) of how colours as representations are to be utilized. But the teacher's questions are helping the student to understand how to use characterizations by the use of the perspective of a car driver.

In line 574-577 another difference in colouring is detected by the student himself, but this time the colouring does not depict a difference in levels but a difference of flooring to show that it is a pedestrian crossing. This shows that the usage of colouring as characterizations here is confusing and not easy to get understood without other semiotic resources than the graphic field alone. But by the teacher's questions bringing out meaningful information about the characterizations and by the use of different encompassing activities the student manages to convey his use of characterizations. The teacher asking relevant questions for architects makes the student able to get a deeper understanding of what it is to make an architectural ground plan and learn that it is of importance to show how vehicles are able and allowed to move within the area.

5.3 Collaboration and technology as means for understanding the main concept

This study will now turn to how the use of a 3D-tool is introduced into a presentation during an ongoing critique session. This is done by examining the presentation of another master student Paul, and his project, which is complicated in its forms and angles by the hovering buildings and parks on top of roofs. The excerpt begins after the one sided presentation by the student has ended and the discussion is well on its way. One of the teachers, whom according to her own statement has been following Paul's project closely, has before this said that Paul's

presentation does not give the project justice. The dynamics of the project are lost by the posters presenting it with a "birds eye view" making it hard to see the hovering buildings and other relevant features.

The difficulty of coming to grasp with the project is evident by the lack of comments and questions in the following excerpt, so the teacher tries to formulate questions to help the process along. That is why the term "main concept" is introduced in the beginning of the excerpt. This is a broad term used frequently during critique sessions. This time the teacher uses it to try to lift the view from the details to the whole of the project. With the help of the term the audience, here represented by "Steve", is trying to come to an understanding of the project, but he is not sure of what to make of the project and not of the term either.

Excerpt 3

591	Martin	but you can understand the *main concept*?
592	Steve	from the plan
593	Martin	Yeah, no from the abstract poster (3)
594	Steve	still a little bit confusing though (3) it will be like a couple of sections (7)
595	Martin	What
596	Steve	At least that's what I think
597	Martin	Yeah (3)
598	Lina	I think we should just put it in the laptop and everyone could turn it and that
599		would be really really easy
600	Martin	is that possible, can we see it (.) hahaha
601	Paul	(nodding) hahaha ((*walking over to the computer and starts meddling with*
602		*the projecton on the screen*))
603	Lina	sorry, hahaha
604	Paul	((laughing))

Here the teacher is trying to find out what other students think of the presentation. He does this by introducing (line 591) the term "main concept". During the critique session under scrutiny the term "main concept" is not further specified, and therefore hard to define. The difficulty of defining the term can be seen in line 592 where the audience member and fellow student to Paul, Steve is confused about what the question is referring to, and in line 594 where Steve confesses that it is confusing. The ensemble is discussing back and forth about what the main concept is, collaboratively trying to get a hold of it. There does not seem to be a solution to how to understand the project or how to understand the term. The discussion comes to a standstill, there is an unsettlement within the group and nobody seems to know how to go on (Wittgenstein, 1953).

After a while an audience member Lina, gives a suggestion about how to get closer to an understanding of the main concept of the project (line 598). Her suggestion is simple, using artefacts such as the computer and projection screen which already is there in front of them. Even so, coming up with the idea is not a simple thing as is visible on the long pauses (lines 593, 594 and 597), and which has been evident on the longitude of the whole question and commenting phase of the critique session so far. Her suggestion even produces a lot of laughter and she excuses herself for coming up with the idea in line 603, maybe because it requires more work from the fellow student performing the presentation.

The excuse also shows how hard it can be to be creative and sticking out your neck in a setting such as the critique session (Webster, 2005, 2006). But Lina dares to overcome these dilemmas and hinders and proposes a solution in line 598-599, where she suggests to "put it in the laptop" so "everyone could turn it". It may seem a little far fetched since she cannot be sure that the program exists on that specific computer, but since the program is used in other courses at the academy, it is a qualified guess, and as will be evident in the excerpts following it is a successful suggestion. It is successful not only in the respect that the program exists, but also in respect of coming closer to what the main concept of the project is.

With the creative solution to use a 3D-model the mood shifts from being dejected, to becoming full of expectation. It is as if the audience members ask themselves what the use of this, in the situation new program will produce. Is it to provide the missing link to the understanding of this term "main concept", which was proven so hard to grasp?

Collaboratively they come up with the idea to use a tool to get to an understanding of the main concept. This is made possible because the presentation is done in this public setting, a critique session in front of an audience. The students learn "…the whole body of practices from the interaction with each other and with more experienced members of the community" (Phillabaum, 2005, p. 170). The students are able to learn from the teachers that the main concept is worth focusing upon to understand the project. And the students are allowed to give suggestions themselves how to fulfil this need. The students are not only there to learn from the teachers but from each other as well, and in this case they get to learn how to integrate a new tool into their presentation. This shows how to get to be a part of that practice is jointly learned by the whole ensemble figuring out what is needed in the presentation to make it understandable.

Below is a short excerpt where the teacher is confirming that the use of the 3D-model was a good idea. This is at the very ending of the critique session and the use of the 3D-model. But the 3D-model has only been used during a five minute period, an eleventh of the total duration of the critique session. This is a relatively short period of time with regards to the positive reactions the utilization of the tool gets.

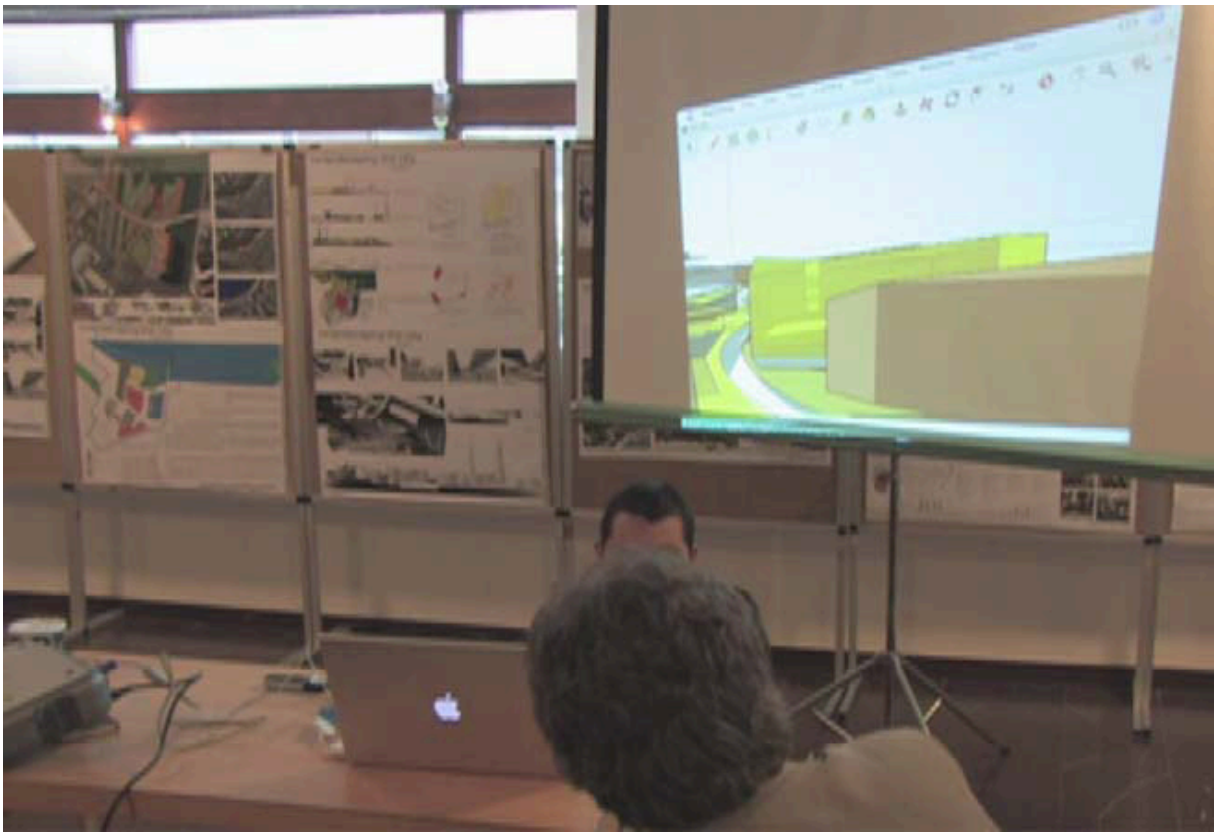

Figure 5
In the foreground the teacher Martin is visible. A glimpse of the student is seen behind him, and in the top right corner the projection of the 3D-model can be seen.

Excerpt 4

756	Martin	this makes it much more understandable
757	Paul	((*laughing*)) yeah
758	Martin	I would recommend to put some of this into the presentation (2)
759	Paul	okay
760	Martin	there is also a lot of forms sections etcetera etcetera

The teacher makes clear that the use of the tool makes the project more understandable (line 756). He recommends Paul to make use of this tool in future presentations (line 758). The teacher stresses that there is a lot to take in; forms and sections are his examples in line 760.

These aspects are of importance to take into consideration when creating an architectural project.

The confirmation of the positive effects of how the 3D-tool is used shows them what tools can be used in presentations. The "main concept" is accepted as understood, and this by the use of the tool to help the audience to enter the end-user perspective.

The recommendation of the tool can also be regarded as an indirect acknowledgement of the idea. Thereby it is a compliment to Lina whom came up with the idea (see above).

In the following excerpts included in this study the practice of being able to move about within the plan with the help of the 3D-tool introduced here and to use language practices of architecture facilitates this way of having professional vision as an architect.

5.4 Constituting shared perspectives in 3D-models

In this excerpt the student Paul has gotten the 3D-model started and is on his way of making use of it. In this and the following two sections of the study, there is not a person moving about in the plan, but instead there is something that I have chosen to call a "projection". This is what is visible on the screen while the 3D-model is used during the session. And the screen is what the audience attention is directed to. This means that the aspect changes from a "birds eye view" as exemplified in the former presentation, to a "human" position of the projection. That is, the circumstances changes so that the audience as well as the others present at the presentation is actually able to experience some aspects of how it would be to experience the area when finished.

The 3D-model is a virtually constructed spatial context and is thereby a representation of the "real world", but some aspects can be made similar to "reality", therefore it is commonly known as a "simulation". For example, if the angle of the projection is at the height of about 6 feet above the ground it is possible to simulate how someone about 6 feet tall would experience the area if real. In addition to this the projection and movements are possible to be shared by everyone present through being presented on a projection screen so all can participate in navigating through the area.

In this excerpt it is possible find out how a 3D-tool can be used in a presentation. When entering into the session the use of the 3D-tool has just started and the teacher Martin wish to begin navigating from a certain position (line 642), in this case a well known existing square in the projected city called "Järntorget", which is in connection to the project area.

Figure 6
This is the position of the "projection" when Paul says "we find ourselves in this place" in line 646. The "ramp" is to the right in the projection and marked with an R, the first path he points to in line 649 is in the middle one marked with a P, while the last path he points to in line 652 is to the left marked with an O.

Excerpt 5

642	Martin	If we go through from Järntorget
643	Paul	through from Järntorget?
644	Martin	yeah
645	Paul	we can (2) having this entrance here (.) going through
646		there we just go through there (2) then we find ourselves in this place ((*Paul*
647		*has "walked" the projection up to the position shown in figure 5*)) we can use
648		this ramp here ((*pointing back and forth with the mouse cursor up the ramp*
649		*named R in figure 5*)) or go through this path here ((*pointing with a back and*
650		*forth motion where the P is in figure 5*)) or
651	Martin	yeah
652	Paul	through this path here ((*pointing to the path at the O in figure 5*))
653	Martin	yeah

In the second line (line 643) of this excerpt Paul is repeating what the teacher says. This is confirmed by a "yeah" in line 644 by the teacher. Paul starts the movement with the comment "we just go through there (2) then we find ourselves in this place", in line 646. Here Paul talk makes the audience aware of the actions taken within the graphic field. This is a feature of relevance for architects because it is relevant to know how from one location to another in the area for architects. Pointing to this feature Paul thereby demonstrates "a level of professional understanding sufficient for judging appropriate" (Phillabaum, 2005, p. 160) features to clarify. The describing of the actions taken is done in a language specific for the trade by marking how the artefacts can be used which shows how the end-user concept is a part of an architect's professional vision.

In the 3D-model it is possible for Paul to show how the buildings and paths are intertwined by the simple moving of the projection. This is done in line 646, where Paul states: "we just go through there" at the same time as he *moves* the projection through a path. This shows that Paul is not only able to state what possible actions that are possible to perform within the area, but it is possible for him to actually perform these actions. This changes the audience's perspective, as well as Paul's perspective from an onlooker's perspective to a perspective of a participant. It is as well possible for Paul to point to alternatives of where to walk, pointing to different paths and ramps, as in line 649 where he states that it is possible "go through this path here" simultaneously pointing to path P in figure 5.

As Paul is pointing at the ramp R in line 648, he is making use of a pointing action. This even if Paul's physical body is not used as a visible indicator of pointing (Goodwin, 2003). Instead there is a motion of the mouse cursor to emphasize what is pointed at. The physical pointing is done exclusively with a tool within the model; namely the cursor of the mouse (I will come back to this when analysing the next excerpt). This is complemented with the deictic term *here* "which instructs the hearer to attend to something beyond talk itself, i.e., the point, to locate what is being indicated" (Goodwin 2003, p. 7).

When pointing Paul says "we can use this ramp here" (lines 647-648). In this phrase he utilizes the verb "use", and in line 649 he makes use of the verb "go". In doing this he lifts forward the actions possible to take which are of interest because they are of the cultural structure of architects. By informing what individual actions are possible to be taken Paul

makes them part of how it would be to walk about in the area, thereby also making the actions part of the larger activity.

The domain of scrutiny is where the target of the point is to be found in the projection, and here the target of the point is an object in the form of a ramp. The target of the point does not exclusively have to be a singular specific object in the domain of scrutiny, but can be an object possible to make use of as well. The pointing can be to a possible action within the larger activity, an "action characterization". Pointing does not exclusively have to be a depiction of a specific feature. The student is not saying "this is a ramp", as if he is depicting it and using it as a representation of something. Paul is not only referring to the object in the projection when he is talking about a ramp.

The pointing is actually putting in focus to a possible social action. So there is a difference of altitude is the pointing is to where it is possible to transcend this difference instead of being to the symbol which is to represent such a difference. The pointing can be said to be to possible actions instead of to symbols.

Using the 3D-tool to be able to walk about within the area becomes a joint activity since it is possible for all present to see the screen thereby having the opportunity to recognize what is occurring within the model. So moving about within the simulation is a social action (Goodwin, 2000). Paul does not have to use different colours characterizations to represent differences in height, instead all present can jointly experience this difference first hand, e.g. by Paul moving the projection through the path in line 646.

5.5 Pointing within the 3D-model

In this shorter excerpt, Paul, whose silhouette is seen to the right in the below figures, is continuing to use the 3D-model, moving the projection about within it. The jointly experienced projection is moved along a path and ends up at a building. This is where the entrance to the building is located and this fact is pointed out by Paul. The place where the door according to Paul is located is shaped as a triangular sloping part of the building (figure 7).

This is still early into the use of the 3D-model, but late in the critique session, which has been going on for over 50 minutes out of a total of 55 minutes by the time of this excerpt. Figure 6 is displaying the path to a housing block which is marked with an O in the figure, and figure 7 shows where Paul has stopped the projection to point at the door. This excerpt shows how relevant features for architects are pointed out within the 3D-model and how these can be said to be a part of the activity framework (Goodwin, 2000). The use of the 3D-model helps the students to learn the language practice and the pointing is helping the audience to stay in the perspective.

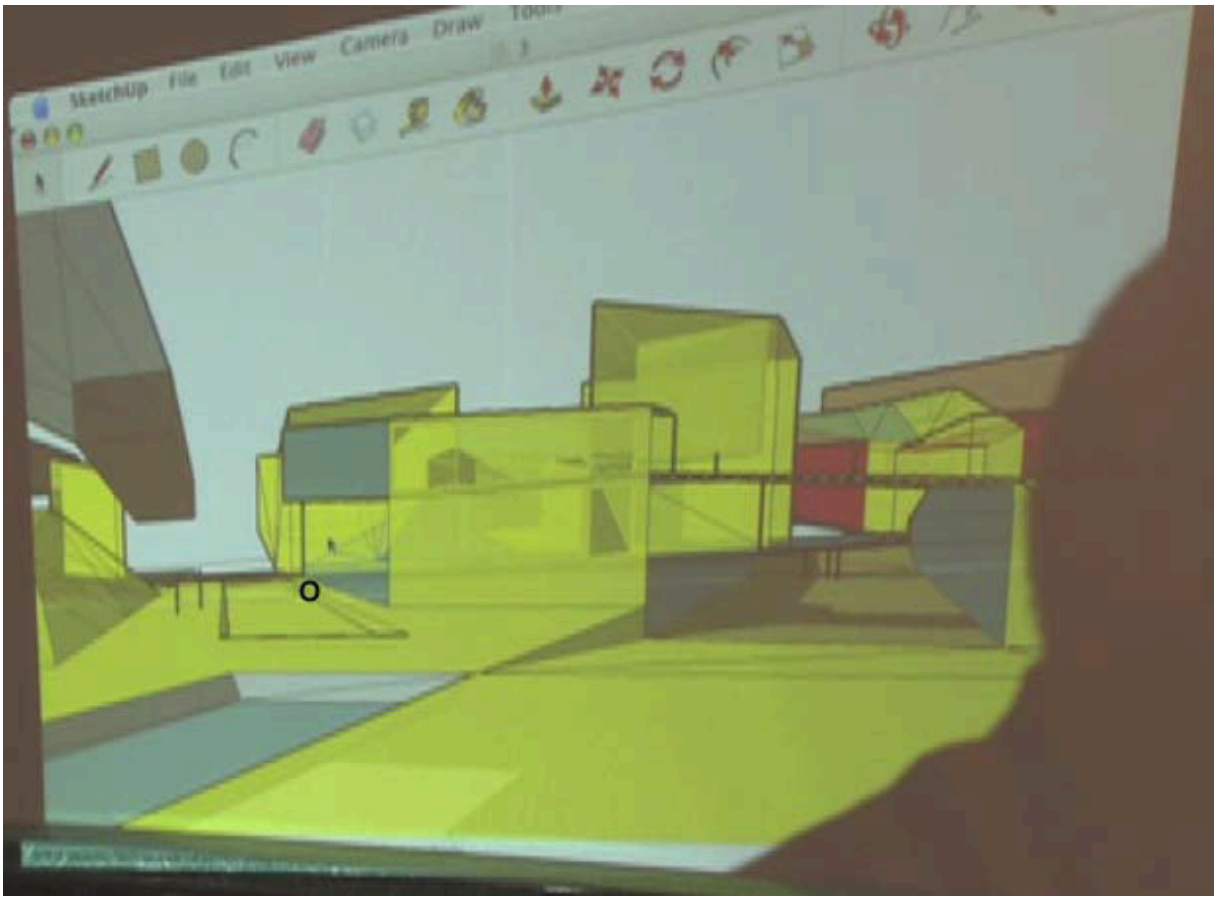

Figure 7
The path leading to the housing block is the one to the left, which is marked with a capital O. This is the same path as the path marked with a capital O in figure 5.

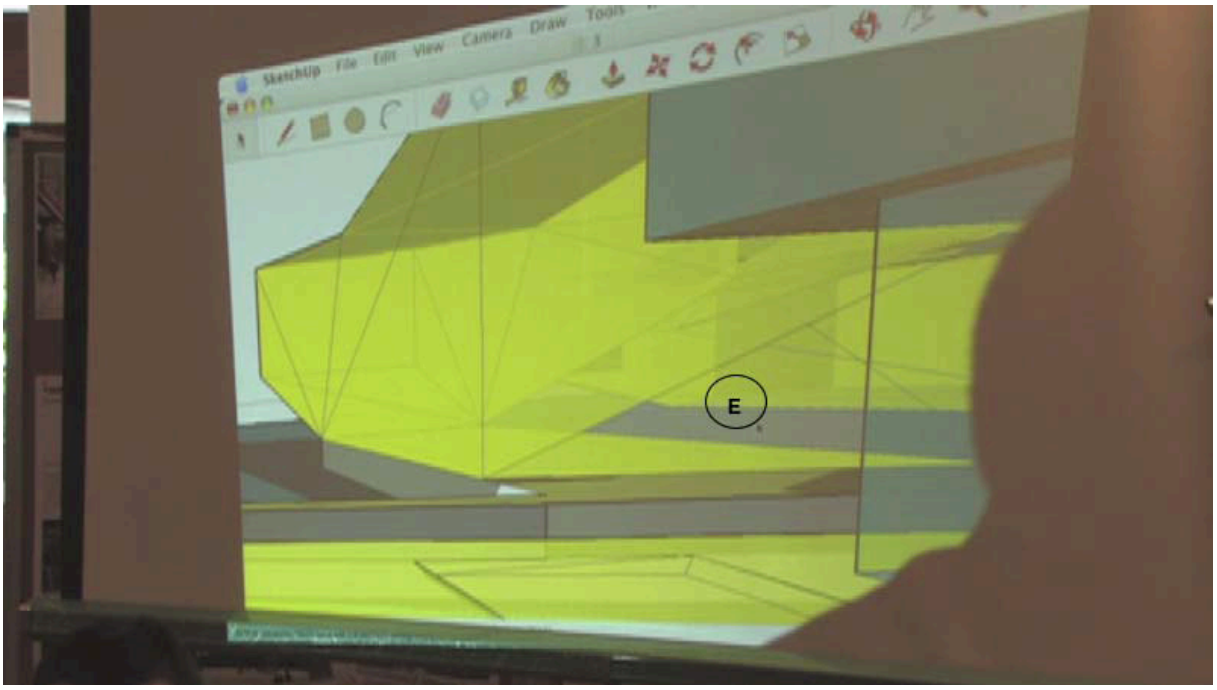

Figure 8
This screenshot is from where the student is pointing to the entrance of the housing block marked with a capital E, in line 712, with the circular movement by the cursor of the mouse illustrated with the black circle surrounding the capital E, and the cursor of the mouse itself in the bottom right corner of that circle.

Excerpt 6

710	Paul	the street to the housing block (.) you would (.) take this other path (.)which
711		is kind of more private then you arrive to the main entrance of the housing
712		block here ((*pointing to the sloping area marked with an E in figure 7*))
713	Martin	yeah
714	Paul	it's more of an enclosed path ((*again moving the projection*))

Within the model as a graphic field there is a lack of relevant details which therefore have to be pointed out by the use of other semiotic resources. There is usually a physical body in the visual space which can frame the domain of scrutiny, or made use of as a visual part of an act of pointing (Goodwin, 2000). But in this example there is not any physical body to link the environment to. The body is not used to highlight relevant details in the surround, and it is not used to frame the domain of scrutiny. Present instead is the projection, the shared perspective of walking and the cursor of the mouse. By the fact that everyone are looking at the same projection stopping the projection is made relevant for pointing. For example as where Paul is pointing to the door, in line 712.

The act of pointing, as exemplified in line 712, is emphasized by the simple movement of the cursor of the mouse. There is no action possible to be seen in front of the screen by a part of a

physical body. The addressees' orientation is towards the projection screen. But there is not any physical body doing the actual pointing in front of the projection screen. Instead it is possible to see the mouse cursor moving in a circular movement within the projection. The circular movement of the cursor is an emphasis of the act of pointing.

The use of the deictic term "here" in line 712, suggests that the hearer ought to attend to something beyond the talk itself and since it is a locative formulation it makes clear that it is a location in the graphic field of interest to pay attention to. This is also of relevance for how the end-user will experience the area, and a part of how it would be to walk about in the area. And the semantic structure of the formulation "main entrance to the housing block" in lines 711-712, suggests that this is a cultural feature that is relevant to architects (Goodwin, 2003).

The door as a detail in the plan becomes a relevant feature which is a part of the larger activity (Goodwin, 2003) by being placed in relation to the movement of getting there. The pointing out that the detail is a door answers the questions "why do we use this path", or "why is this path in the city plan", as well as the question "how and where do we enter that specific building?" questions highly relevant for architects. By pointing to the door in a deictic manner and stating that it is a door by the use of talk, the properties for that detail have changed and it has become a relevant feature which is possible to associate other actions to. One of these actions is the possibility to enter the building by the use of the relevant feature pointed to, the door.

It is possible to come to the conclusion that pointing here as well is not only a reference or a depiction, but it is a depiction related to the social action. The pointing is helping the audience to understand what the area would be like if it was real and thereby keeping them within the end-user perspective. Keeping the audience within the perspective is done by adding information to how it would be to move about in the area. In this case showing where a building is entered. When the audience is kept in the perspective it is possible to understand how the pointing is related to the larger activity.

To learn to point to what are relevant features in the graphic field for architects and what questions to answer by pointing them out, is a part of how to talk about objects and environments (Phillabaum, 2005) that are of essence for the profession under study. The

students get to learn the language practices of being an architect which thereby are handed down to the students from expert members of the community (Phillabaum, 2005).

6 Discussion

In the above sections this study described and analysed situation of talk-in-interaction during critique sessions. First of all, in sections 5.1 and 5.2, the study brought up how the teacher assisted in the understanding of a project by the introduction of a perspective. This introduction made it possible for the student to easier convey the relevant features of his plan. Secondly, in section 5.3, how mutual understanding is formed by collaboratively coming up with ideas was analysed. Thirdly, in sections 5.4 and 5.5, how a 3D-model can be used was examined together with how pointing within such a model is done, and what language practices are used as navigating through the model.

Below this study brings up these results in relation to the theoretical framework and the literature that was introduced in the methodological part of this study. My focus will be on how the use of a perspective can facilitate the understanding of an architectural project; on how the critique is a joint activity where collaborative activity has the possibility to take place, and how the use of a 3D-model makes it possible to enter the end-user perspective in a facile manner. I will also point out that knowledge of this tool and how the utilization of the tool is of relevance for persons studying to become architects.

6.1 Renegotiating colour characterizations

Starting here with how the student Eric in sections 5.1 and 5.2 is making use of a ‘ground plan’ to make his project understandable. He is trying to use talk to describe the features of the ground plan. When trying to convey semantic meaning with the help of talk it is of importance that the graphic field is used consistent. While designing the plan the student himself has decided what the characterizations should represent, but during the critique session he is trying to convey the characterizations to others. This proves to be difficult, the student has to learn how to master the language practice (Phillabaum, 2005) of using characterizations as representations.

This two-dimensional plan does not make it possible to move the projection about within the area. Therefore Eric has to choose a perspective and explain the characterizations he has made

from the chosen perspective. In excerpt one Eric stated himself that he was not sure of how he wanted it. This also becomes clear during the discussion between him and the audience in the later part of the critique. The colours Eric has used are at one instance depicting a difference in height and in another instance depicting a difference of the materials used. In this way it differentiates itself from what Goodwin (2000) shows the children doing in the hopscotch court and how archaeological professionals use the Munsell chart, where consistency is what makes the graphic fields understandable. Since Eric does not withhold a consistency the meaning of the characterizations has to be negotiated, and this is done by the teacher asking questions about where cars are allowed to drive and not. Thus by the questions the teacher asks, the student learn that the consistency must be withheld to make the colour characterizations possible to be understood. The student thereby learns a language practice, something that is possible since he is participating in a critique session. If it would have been a closed event, where students were not allowed to take part in the teacher's critique but only get the grades, this language practice would have been harder to learn.

By the end of this excerpt the characterizations of the colours has been cleared up, but in what way was this possible? The student had to renegotiate and redefine his characterizations to make them understandable. This was done by explaining the colours from within a perspective. In this case the perspective of a car was used. The influence of the experienced architect helped the student to adapt to a certain perspective, and to explain what was allowed to perform and what was not allowed to perform according to the characterizations by the use of colours. By the use of verbal communication and by the introduction of the end-user perspective the communication ran smoother. Hence in this case the introduction of a perspective was an important part for the communication between the student, his embodied actions, the graphic field and the audience, to be successful.

6.2 The collaborative setting of critique sessions

Thanks to the critique session being a collaborative setting a suggestion which solves the problem of how to understand the project is born.

Problems of understanding arise in the second presentation included in the study as well as in the one discussed above. During the presentation the graphic field together with semiotic resources has not given enough information for the audience to understand the project. The

positive parts of the project have not come into light. This has led to a silence among the group, they do not know how to go on (Wittgenstein, 1953). The critic is therefore introducing the term “main concept” to try to get someone in the audience to comment on the project. This is a term that works as an opening for the members of the audience to air their views on the project. Thereby the use of such an open term promotes collaboration. In another setting the term might mean something else. It might lead to other suggestions to come up, and it could make it possible to understand the project in another fashion. The term includes the whole project and at the same time the single details of the same project. It becomes hard to understand the project and it becomes equally hard to understand the term. But in the void that the introduction of the term has created the ensemble collaboratively come up with the idea that understanding the project might be easier if another way of presenting the project is used instead of the two-dimensional plans. The idea to use the 3D-model thereby comes up in a joint process.

What is required for such a suggestion to come up? First of all it requires that the critique session is in a stage where comments on the presentation are welcomed. It is a premise which allows the audience to place questions, and come with suggestions to solve problems. The questions and commenting phase of the critique session, is “a learning environment in which multiple experts are present and where students must constantly interact with each other, in joint problem solving”, as Phillabaum (2005, p. 172) puts it. An environment that Phillabaum is convinced would benefit from examining. He is indeed right; it is possible to see knowledge being traded in this critique session. And it is not only the teacher who provides knowledge; it is also given from students to other students and from teachers to students and even from students to teachers.

Let us look a little closer on what happens when the idea of making use of the 3D-model is born. For the suggestion to come up there is the premise that questions are culturally accepted (a), and then, when this foundation is laid, it requires that a problem arises and that the ensemble jointly try to find a solution (b), and here, in this creative space of collaboratively putting their finger on what they want to do (c), and recognising that there is a problem getting to where they want (d), (an understanding of the main concept), a creative solution is created (e).

As it is possible to read out of the last excerpt in the study it was a successful suggestion they jointly came up with. This shows the importance of letting everybody have their say in a collaborative setting as the critique. When a suggestion has come up it is also of importance to recognize the suggestion. Therefore the critic is to have credit for embracing Lina's idea, making this important step in the presentation take place.

6.3 The significance of the 3D-model in creating a shared perspective

By the use of the 3D-tool in critique sessions the students get to use one of the cultural artefacts of importance for the profession. The student is guided in how to use the tool in a presentation by the teacher's instructions. These instructions are to navigate through the simulated area starting at a certain location. The instructions are followed by the student moving the projection to the desired location. Thereby Paul as well as his fellow students gets to learn a way of using the tool in a presentation and learn the language practice. In other words the teacher by his instructions is letting the students know the "ways of talking and the ways of using the professional tools that characterize the profession" (Phillabaum, 2005, p. 149).

Turning to how pointing is done in the example in part 5.5 of the study, it is possible to read out that everything that Goodwin (2003) has stated as necessary for pointing is there, except the possibility to use the body as a visible indicator of pointing. This leads to some consequences to what Goodwin (2003, p. 219) states:

> Within such a field, pointing is constituted as a meaningful act through the mutual contextualization of a range of semiotic resources including at least (a) a body visibly performing an act of pointing; (b) talk that both elaborates and is elaborated by the act of pointing; (c) the properties of the space that is the target of the point; (d) the orientation of relevant participants toward both each other and the space that is the locus of the point; and (e) the larger activity within which the act of pointing is embedded.

He argues that pointing "is constituted as a meaningful act through the mutual contextualization of a range of semiotic resources including at least 1) a body visibly performing an act of pointing" (ibid. p. 219). But in this case we do not have a body visibly performing an act of pointing, instead we have the motion of the cursor to emphasis that a pointing action is performed. The body is in that respect not needed as a visible feature

performing the act of pointing when a 3D-model is used, and what to look for is instead a deictic movement of the cursor of the mouse to be able to identify what emphasizes an act of pointing.

His second requirement is "2) talk which both elaborates and is elaborated by the act of pointing". This is found in the two examples of pointing in this part of the study, e.g. as deictic terms. Therefore this does not have to be elaborated further here.

The third requirement I will come back to below. Here I will go on to state the forth requirement on Goodwin's list where the participants bodies are in focus: "4) the orientation of relevant participants toward both each other and the space that is the locus of the point". This is not the case in these examples where the presenting student's attention is towards a small computer screen rather than the big projection as the audience is directing their attention to. Instead there is a standing still, a non-motion of the projection framing, and highlighting of the point (Goodwin, 2003). Some details are hastily gone by thereby these are treated as irrelevant. Others are stopped at; thereby arresting the projection is actually functioning as an indicator to what is relevant to focus upon. Goodwin (2000) states that participants highlight relevant features by the orientation of their bodies. Here highlighting is done by the help of the non-movement of the projection.

The fifth listing is the relation to "5) the larger activity within which the act of pointing is embedded" (ibid.). If I may direct the attention to the third requirement listed above and elaborate this together with this fifth listing, it is possible to say that the student by the properties of talk states that there is a door at a certain location construes what is being pointed at as something of cultural relevance to architects. The entrance showing where it is possible to enter the building is at the same time as pointing to a door which is making the building accessible to the end-users of the area.

Instead of pointing to the properties of the space, there is something else that the pointer here is making use of, something that I earlier in the essay called an "action characterization" of the target of the point. That is, Paul is by the semantic structure of the term "door" informing the hearer that this is where the building can be entered and puts the target of the point in relation to the larger activity; this by specifying what can be done with the artefact he is pointing to. The entrance is a part of how the end-user will experience the area, it is a part of

the actions that can be taken within the area, and it is an answer to why end-users would use the path leading up to the entrance. This is also recognized by the student who uses a language that helps the audience to stay within the perspective. Keeping the audience inside the perspective is done by pointing out relevant features in the surround as well as relating actions to each other within the plan by talk, things that makes it possible to understand how these figure into the larger activities. Thereby the pointing can be said to be from *within* a perspective.

6.4 Future use of the 3D-tool in students' projects

The use of the 3D-model in the episodes included in this study is not always in the most proficient way possible. There is always room for improvement of how to utilize such a tool. But this is not necessarily something that should discourage the use of it. Rather it is possible to advocate a wider use of the tool, maybe even advocate that it is made a necessary part when the project is to design a city area. Making it a part of such an assignment would make the students learn more about how it is to be used since the critique sessions provide valuable instructions on how it can be used. This could also help enhancing the students understanding of how the area would be experienced for someone utilizing it when the project would be realised.

It is evident in the excerpts that not only the student performing the presentation, but the other students within the audience are engaged in the learning process of the critique session as well. The students get to see what the experts are looking at, thus they collaboratively come up with what the "professional vision" (Goodwin, 1994) of the subject is. This is an example of how seeing is "a dynamic, interactive, and emergent process that involves a number of professional practices that do not exist alone in the head of the individual … but which must be learned in joint activity with others" (Phillabaum 2005, p. 148). The instruction from the teacher to move from a certain position and to see how it is to move from that spot to another is possible to read out as a way of seeing an area for an architect. All of the students have the opportunity to see such a program as the 3D-model come to use during a naturalistic setting and they all have the opportunity to see how to use these programs. Hence it is of importance to use the program in a collaborative setting like the critique to learn how to make use of it.

A tool such as the 3D-model which makes it possible to enter a perspective can be seen as a joint activity by all persons present doing the same thing at once. It is a social activity that more than just one person can be a part of and which makes it possible to navigate through an area as if it was real. This makes it a good tool for conveying how an area is designed. By the use of this tool as a part of a presentation it is not necessary for the ones trying to understand the presentation to have full knowledge of the architectural language but still possible to appreciate the advantages of a project.

An advantage of using the 3D-program in a critique session is that the students learn more "than just to hand in an assignment they learn through interaction using relevant cultural artefacts" (Phillabaum 2005, p. 170). The students learn what relevant information for architects is by the use of the 3D-tool and they learn how to convey this important information for architects to others. To get knowledge about this is to get trade specific knowledge of the ways of using the tools (Phillabaum, 2005) which is needed to be able to make it possible in this way to convey the end-user perspective.

The setup of the presentation with both the posters and the projection-screen is a hybrid setup (Lymer et al., submitted). In the latter presentation of this study the 3D-tool is a part of the projector-screen technology. The 3D-tool does not make use of a sequential structure but rather a virtually constructed spatial structure. This makes 3D-model into a hybrid with uniting qualities. By the use of the 3D-model it is possible to zoom, to turn and to stand still. All these possibilities are included in the properties of the 3D-model, it unites different forms of representation into one. This makes it possible to talk about, and discuss the projects from different perspectives. A problem with such a hybrid though, is that it requires the audience attention to be directed to the screen at all times since it can be in constant change if the projection is moved. This separates a hybrid from other presentation forms making use of a sequential structure, where it is possible to discard the projection, or poster for a moment as it is not constantly changing.

A technology such as the 3D-tool puts pressure on the user to be active during the presentation. The user has to guide the audience through the area by the use of a variety of keys on the computer at the same time as he is commenting what is seen in the projection screen. If the 3D projection tool is programmed before the presentation it requires knowledge of how to do this in a proficient manner. Thereby there are problems following the

introduction of such a tool in presentations, but may be worth them if they facilitate understanding of the projects making use of them.

During a critique sessions commenting phase it is common that other parts of the project are commented on than the one visible at that moment. Since the projection of a mobile hybrid is changing constantly it could be recommended that it is used together with posters to facilitate commenting on other issues of the project. Neglecting to facilitate commenting by also making use of posters could involuntarily make the presentation drag on and may contribute to loosing the audience attention. Even though this problem is not unique to mobile hybrids as these problems could occur also when utilizing sequential projector screen technologies.

To adjust the tool to better suit the use in architectural presentations the tool could be made to facilitate the staying in the perspective of an end-user. This could be done by making it possible to "lock" the "projection" in different heights above the ground, to better be in line with how a human would experience the area. It could also be made possible to set the movement of the "projection" at different levels of speed facilitating how it would be to navigate through the area by different means of transportation. Other features that would make it more in line with a perspective and facilitate the use of such a tool could be to make it impossible to transcend walls and other hinders.

Finally, it can be said that the making use of a 3D-model as a way of entering a perspective does make it possible for the whole ensemble to see the shapes of the buildings and where doors are located. It becomes easy to see where paths lead by the mere action of moving the projection down the path. It makes up a harmless way of combining many features of relevance for architects (Phillabaum, 2005) and making it easy to judge what the features will be like in reality. Since it is the "projection" which is moved about within the area this makes it easier to position the "projection" in a way that lines of sights can be experienced instead of trying to understand what they would be like by leaning over a physical model or looking at an overhead shot of the area as for example a ground plan. This also makes the lines of sight accessible to anyone, even the layman.

6.5 Professional vision of architects

This study has brought up two examples of how part of what 'seeing' as an architect is to be able to 'see' a project from within a perspective. It is in this study argued that this is one aspect among others as of what it is to have professional vision as an architect. In the first presentation examined in this study two-dimensional posters and power points were utilized together with characterizations in the form of colours. While in the second part of this study a 3D-model was utilized together with the calling attention to possible actions. In both of these entering a perspective made it easier to understand the students' projects.

In the first presentation the student does not at first see the need of getting the audience into a perspective. But after the teacher has asked what it would be like to drive a car within the area the student adapts to the perspective of driving a car and thereby an end-user perspective is entered.

As I hinted at above the teacher and the student look for different things in the presentation. The teacher is trying to place himself inside the area, moving about within it. He is looking for how someone would experience the area when it is finished; he is looking for the end-user perspective. The student is looking at the plan more as from above, from a "birds eye view", he does not see how it would be to walk, or drive about within the area.

In the second presentation a collaborative discussion, possible because the naturalistic setting is a critique session, has led the ensemble to the possibility of entering the end-user perspective as well. When pointing out possible routs inside the area the student uses a language which uses the present form, as if he was actually walking down these routes. This makes it possible for the students to understand how to use the tool and what language practice to use while making use of the model. The student is able to actually perform the actions as well as referring to them as possible. This shows that a perspective has been entered. The perspective is of someone walking about in the area actually performing these actions. The gap between the fictional world of the simulation and reality has thereby become somewhat diminished.

The 3D-model is projected onto a screen visible to all of the audience. This gives the audience a chance to experience the end-user perspective all at the same time. They all have the chance of becoming participants in the act of walking about inside the model. Entering the

perspective of an end-user gives the audience a possibility to understand the main concept, which by the use of the 3D-model becomes the larger activity (Goodwin, 2000), by the fact that all actions taken within the model being embedded within it.

When the use of the 3D-model begins it is possible for the ensemble present at the critique session, to adapt to the act of walking. That is, by being led through the plan by the student, it is possible to talk about the whole ensemble, as a unit taking the same actions, therby sharing the same perspective. The ensemble becomes participants in the joint activity of walking about in the area. The moving about in the model has a "public, prospectively relevant visibility, so that multiple participants can collaborate in an ongoing course of coordinated action" (Goodwin, 2000), which makes it into a social action.

Entering the end-user perspective makes it possible to come to grips with the "main concept" as the teacher asked for. To put it in other words: to be able to experience the area from within the perspective of a person navigating through the area makes it possible to understand the main concept of a project.

Utilizing a perspective makes it easier to understand characterizations in an architectural presentation and shows what it is to walk about in a city area as an end-user. By utilizing a perspective the teacher highlights (Goodwin, 1994) parts of what architects find important. Utilizing a perspective makes it possible for the students to learn the "ways of talking and the ways of using the professional tools that characterize the profession" (Phillabaum, 2005, p. 149). The use of a perspective facilitates one aspect of the task of 'seeing' as an architect.

7 Future studies

The above sections discuss the results of the study in relation to the theoretical base of this study. Below I would like to come with a few suggestions how the themes brought up by this study can be further researched upon in the future.

First of all making use of the 3D-modle and entering a perspective changes the language to present tense and the use of action-characterizations become more frequent. This makes it possible to study how such a model is used from a perspective of acts performed with in the 3D-model. This will make it possible to put under scrutiny what the implications are for the

theoretical base of this study. Inquiries into how the perspective relates to the "framework" Charles Goodwin (2003) asks for, can be placed.

By looking at the semiotic resources in relation to the activities the participants are performing it is also possible to contribute to the elaboration of the vocabulary for a theory of action, as well as to address such issues as tacit knowledge, the notion of reflective practice and the theory-practice distinction.

Something this study has brought up is the use of the term "main concept". This is a term frequently used by the experts during critique sessions. It is a general term in the way that the meaning of the term varies. Sometimes it is used as the beginning of an inquiry about what is missing, e.g. that a building is missing a *main concept* thereby only being a building and not architecture. Or else it is used by the experts to make it possible to focus one the whole project, to get a holistic view of a project, as is the case in this study. The term is thereby general with multiple meanings and uses, something that makes it a preferable term to research further upon.

Something else worth focusing attention to in future research is what the missing of a body in the 3D-model get as consequences. Thereby studies on how 3D-models are used and how interaction is made in relation to the 3D-model are questions that would benefit from being examined further. The way interaction is performed in relation to a 3D-model can be linked to questions about professional learning and professional vision, as Phillabaum (2005) points out with regards to interaction in relation to the material world.

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