

SKETCH AS SKETCH CAN OR MODEL AS MODEL CAN?

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Abstract

This paper reports about an ongoing experience for the use of computers in the early design stages. It tries to evaluate how recent software developments in the field of CAAD will influence the way architects design and how we teach them architectural design. There is now doubt to us that the ongoing change in the technology will influence the way we work in future when we do architectural design. It is an important question for every school of architecture what effect these developments will have on our teaching and curricula. We use an ongoing educational project to try to find some answers to these questions.

1. Introduction

After the introduction of computers into our field, there has always been a battle between “the computer guys” and “the ones who deal with architecture”. The reason for this was that the computer started his career in architectural offices first as a word processor and for office organization but not for the architecture itself. A very short time ago – at least on an architectural timescale – it moved on into the architectural production process as a drafting machine. All the early experiments in using the computer as a design tool were quite exciting for “the computer guys” but rather disappointing for the rest of the architects. Just a second ago on this architectural timescale the computer started to really influence the design process itself. It started as an accepted tool at the end of the process of designing, creating and building architecture and is at the moment moving towards the beginning of the process. Today we have some buildings where the computer clearly had an influence on the design of the building at an early stage, but this is still an exception to the rule. As far as we know the main tool for architectural design in the very early stages amongst the majority of architects is still sketching. Therefore there has been an attempt to give designers digital replications of traditional tools (pen or pencil and paper) to use them

in a manner that mirrors the traditional way of design; but with the assistance of the computer to enhance and augment the process. But the question still is: Do we necessarily need to sketch when we are working on a design? Or is it just because we have been trained to do so and because it has been the most efficient way to clarify ideas in the past? So what would happen if we started to teach our students from the outset to design with the computer? Will it increase their design capabilities, or might it hinder their ability to generate design ideas: might the change to digital sketching be an unnatural one that ends up constraining rather than freeing ideas? Or will traditional sketching be replaced by digital model making in the long run? Is there not also a case for quite naturally starting an architectural design with the computer when it is omnipresent in every aspect of both work and daily life?

2. The beginning

One of the key aspects of our experiment is to work with first year’s students that have not yet gone through a traditional training on architectural design and CAD systems to get a more unbiased look at the possible tools at these early stages of design. We started the project in 2004 with First Years students from Austria

and England during a workshop at TUG. Because this first workshop was initially not intended to be a research program, it was not structured enough to evaluate the results scientifically. However, this “first run” had some very interesting results and those results been presented at Sigradi 2004 in Brasil. In 2005 we wanted to organize a much more structured workshop at TUG Graz in this field but due to the problem of having to fit the project into the restraints of two different national curriculums and existing courses in architectural education, we failed to have it structured rigorously enough to be able to compare the results on a highly scientific level. There was also the problem that we could not free the workshop week entirely for this course so the Austrian students had also other courses and business to fulfil. As it turned out also the English students had some other “interests” so the organization was sometimes a bit demanding. We still had some very interesting findings which we will report in this paper (and were able to present at CAAD-Futures 2005 in Vienna), but we want to establish a more “proper setting” without the restrictions mentioned above. Therefore we are in the process of preparing an Intensive Seminar between six European universities to do the workshop in a more controlled environment

Our Main goal was to see whether designing wholly on the computer would produce substantially different results to those produced via a more traditional design process. As mentioned above we wanted to do this as early as possible in the curriculum with the very young students to minimize unwanted influences from previous experiences - CAD courses or Design courses. Ideally they should not have any experiences in both fields. It turned out that it was not possible to preselect students that fulfilled these criteria. Because of the short time of the workshop course – one week in our curriculum – it was very intensive work for the students and the teachers. In one week the students had to cope with a lot of things they had not encountered before. The digital group even had to work with new software and the analogue group struggled with model making and untrained sketching skills.

3. The brief and the site

The Brief was a house for a couple of artists on a small site in Graz. We did not establish a detailed brief - the artists should be able to live, work and present their work in this house. The students could choose their combination of artists (clients) and describe their needs first and develop their own brief in discussion with the tutors. They could choose out of a list including Sigmund Freud / Brian Eno / Richard Long / Rachel Whiteread / Damian Hirst / Adolf Loos / Michael Clark / Edgar Allen Poe / Massimo Tamburini / Germaine Greer / Tracey Emin / and Karlheinz Stockhausen.

The site was on a small urban corner site adjacent to a parting wall and consisted of a small slope and a significant tree, so it was quite a demanding task for our inexperienced students.

Overall we had 16 students from Liverpool and 16 students from Graz. They were divided into two groups of 16 students each, one group working digitally and the other traditionally on the above mentioned scheme on the same site. Both worked on the problem simultaneously in an environment that allowed a controlled analysis. Students from each institution were paired and worked with tutors from both institutions.

4. The workshop

The initial workshop was one week in Graz where they started on Monday morning with the introduction into the project. Afterwards they were split into the digital / analogue groups and were paired into English /Austrian teams. This was followed by a trip to the site and some research on their proposed clients on the internet. In the afternoon they had to present their choice of clients and started to describe what they thought their clients would need. There were some interesting client combinations like Sigmund Freud and Damian Hirst. Most of the groups did a very thorough presentation of their clients using digital media they collected from the internet. Then the groups split to work on the design in either the computer lab (digital group) or the seminar room

(analogue group). The digital group started to do Tutorials on the software (Sketchup 4) and the analogue group worked on a site model. The digital group were not be allowed to use any analogue means in the initial design phase and the analogue group was not allowed to use the computer for design purposes. As mentioned before both groups of students were first year level who had in theory similar levels of both CAD and traditional skills.

After this first day they had three days to develop their design and on Friday afternoon they had to present the results of this initial first workshop week. After this workshop all the students had five more working weeks to finish their design individually. As a final result all of the students had to present a digital and analogue version of their design.

5. Some observations

Some main questions involved in the evaluation of architectural design in our educational setting were as follows

- Is it an interesting design solution?
- Is it a complex design?
- Is it an appropriate design?
- Do the students understand their own design?
- Does it increase their design abilities?

During the workshop week we tried to supervise how typical schemes developed when students used wholly traditional and wholly digital techniques respectively. The evolution of the designs shows a number of contrasting features that can be summarised as follows.

In the manual scheme much of the development was through 2D sketches and explorations in drawn 3D are rarer events. Although they produced 3D working models, this happened mainly after the 2D sketch design phase and most of the time only one model was produced. Although they had the big site model to hand, they tended to forget about working in the context of the site. Sometimes they had already worked on larger scale sketches to work out details of their design - this did not

happen among the digital group

In the wholly digital scheme the evolution of the design was in 3D. This is clearly necessary and directed by the chosen CAAD system (Sketchup). Some of the students had problems working wholly in 3D and tried to find a way to work in 2D. This time nobody tried to sketch in 2D on paper, but there were people trying to do additional 2D plans using AutoCAD to clarify certain aspects of their design. This turned out to be when people already had previous experiences with CAD software and traditional design experiences – they had problems using Sketchup which requires a different approach to more conventional CAD software. The digital group produced significantly more design alternatives and usually tested them in the context of the site and building rather than in isolation. Some of the alternatives have been forced by crashes or mistakes in the software. This brought sometimes frustration but also led to interesting serendipitous solutions.

We had two interesting occasions to evaluate the designs during our project. The first was at the presentation after the first workshop week and the second was five working weeks later at the final presentation.

There were some interesting observations to be made. At the presentation of the results of the first workshop week there was a significant difference between the digital and the analogue group. At the presentation the digital projects “looked” much more developed than the analogue ones although this sometimes was only superficial.

After this first week the digital group in general seemed to have a better understanding of the architecture they created – at least in their spatial aspects. But we also had people with interesting solutions who did not understand them at all.

The analogue presentations after this first week left the impression that many projects were not yet developed as far as those from the digital group. Additionally the lack of sketching and presentation skills of the student made many of the projects “look” less interesting than the digital ones.

One interesting finding was at the final presentation

(five working weeks later) that there was not too much development of the projects in the digital group. Most of them decided that the main design work has been already done after the first week and just “polished” the models for final presentation. They also made their analogue model just to fulfil the brief and not to find anything additional or new. The projects of the analogue group developed more over the next five weeks.

Interestingly many students from this group did their main design decisions still using analogue tools. Although they had to make a 3D Sketchup model many of them just did it to fulfil the brief and did not get much further out of it.

6. Conclusions

As we can summarize after two experimental educational projects the statement of Rauhala, (2003) - “It seems impossible to use computers as a creative adviser or as a generator of totally new design solutions. Likewise using computers for generating new and creative associations seems to be in principle infeasible.” – is not true anymore.

With our findings we can clearly say that modern CAAD software is at least an additional possibility to start a design with clearly new benefits and still some disadvantages.

It is clear that in using software like Sketchup in the early design stages leads to a different design process. In fact the name of the software should be “Modelup” because it is much more about working with models than working with sketches. We definitely do not always have to sketch when we start thinking of a design! As a traditionally trained architect, it seems to be the ‘natural’ thing to do but this will change for future generations. There are advantages with that and also some disadvantages. Firstly it’s not the right tool for all designers but has definite potential. It leads to interesting complex design solution with a better control of spatial aspects even for inexperienced designers. Using easy to handle 3D modeling software helps to find appropriate design solutions because it emphasizes the use of the model “on site”. It sometimes allows

the students to understand their own design better and definitely increases their design abilities in a rather short time because they tend to be more adventurous – at least when they loose their “respect” and use it as a playful tool. There are still some drawbacks at the moment and as a traditional designer you are tempted to take the pen and make a sketch when something is not working like expected in the 3D model.

So we clearly have to use all tools available to us when we do a design but 3D modeling software like Sketchup will definitely change the way we design and gives us additional possibilities which sometimes will substitute traditional methods.

7. Outlook

As mentioned above our next step will be to do a workshop exclusively on this topic without the restraints of having to fit it into the normal curricula. We are preparing a Socrates intensive seminar which will bring together first year students and teachers of six European countries to do a similar project. We hope that in this workshop we will be able to introduce a more rigorous structure to have a more scientific setting but still be able to have the creative atmosphere necessary to do architectural design.

As a second strand we also want to get an overview about the use of CAAD in the early stages of design in the “real world”. Therefore we have prepared a web review form for architectural practices which will go online this September.

We will present the results at SIGRADI and hope to find some partners to do the same review in South America.

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