A comparative study on traditional design process with computer based
Second Year Design Studio in National University Malaysia (UKM)
as Case Study

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Abstract: Birth of technology and its entry to various fields, especially into education systems has its own pros and cons. But the important issue, here, should to acquiring the impact of this presence in order to enhance benefits and reduce drawbacks on educational systems. Digital software has opened a new era into designers and students of art and architecture. Understanding and learning the rules of this new era not only can help designers to keep up abreast to the newest knowledge and technology but also it can help novice designers to rescue from trap of this new world. Main goal of this paper is to study the impacts of using digital technology in design studios in second year architecture student in university Kebangsaan Malaysia as case study by analyzing and comparing student’s process and progress during one year.

Key-Words: architecture education, traditional studio, computer aided 3D software

1 Introduction

One of the important aims of education should be to help students acquiring a functional understanding of the subject studied. In the other word learning is seen as developing certain abilities and values enabling the learner to handle novel situations in powerful ways. But in design profession variety of fields from natural sciences to social sciences is needed more over artistic skills. Architects should be able to translate mental pictures to the drawing boards. Similarly, architecture education curriculum consists of courses that develop design knowledge, artistic and technical skills [1]. So architecture students are placed in the difficult position of attempting to understand complex drafting conventions without the benefit of years and experience. Most design students begin their education without or with limited personal experience in observing and understanding the spaces and forms. The first two years of architecture education are the most crucial for architecture students because during these years students form attitudes that they carry with them throughout their careers. During this time, students struggle with concept of architecture as a hybrid of art and technology. Also they have to represent their ideas through free hand sketches or computer aided three dimensional visualization technologies. Some believes that students should use free hand sketches to show different perspectives of the design and they mention that this ability helps student to develop their idea and reach better results. On the other hand emergence of computer and 3D software and the facilities it brought to visualization process made this question that does it affect student’s design process and their result? The general objective of this paper is to present an investigation In student’s progress in traditional design methods compared to the progress of similar students when they use computer to develop their ideas and designing project. So first of all we will discuss about the potentials and reasons that digital software has imported to architecture
education and then by revealing the importance of second year in architecture education, we will introduce university Kebangsaan Malaysia (National University Malaysia-UKM) as a case study and by analyzing and comparing students design process and tutors and jurors satisfaction level we will came to the conclusion that how using 3d software can be helpful in design education.

2 Presence of computer aided 3D software

New representation techniques, made possible by the new computer-aided 3D software packages, exceeded the traditional means of graphic illustration and scaled models [2]. This technology has been primarily developed to decrease the amount of abstraction between architecture and its documentation[2]. In addition this new technology offers unattainable qualities such as motion, texture, real-time shadows, and so on, in order to more enhance in situational awareness[2].

Traditional 2D architectural representation is capable only of depicting aerial or planar concepts and implies a spatial dimension only when these concepts are used in series [2]. By merging motion with computer-aided 3D visualization techniques, spatial concepts can be easily conveyed [2].

In the second year studio must form a bridge between the abstract design principles and ideas taught in the first year and the synthesis of a building that is the focus of the third year. In the second year, design problems are formulated to instill an awareness of the impact of the space and form, as well as space making, use, and tectonics on architecture. Students must learn to use their knowledge in a flexible manner, producing multiple alternatives to design problems [3].

2 Education in second year design studio in UKM

The second year of design studio education in student’s training as it introduces significant issues that the students must address in subsequent studios. The second year builds upon the knowledge, skills, and enthusiasm that students bring with them from the first year, where they have acquired basic drawing and modeling skills and have been taught to think in spatial terms. The second year studio must form a bridge between the abstract design principles and ideas taught in the first year and the synthesis of a building that is the focus of the third year.

23 students were part of our design studio and in each semester more over some small- small projects one main project defined.

So we chose second year design studio as case study for this study and first semester (seven-and-a-half weeks) to work base on traditional drawings and modeling while during second semester (ten-and-a-half weeks), students introduced to use computers in enhancing design possibilities. First semester took place on drafting tables and in second semester all students were assigned their own workstation as part of their drafting table. Students arbitrary were able to choose working with computer digital design media, and 3D modeling to develop a critical design sense of the fundamentals of architectural form, systems, and vocabularies or again based on traditional model.

It should be mentioned that before students enter the studio they had limited experience with software modeling packages and simultaneously during the semester they had some sessions to help them to improve their skills in working with 3d modeling software.

3 RESULTS AND DISCUSSIONS

During first and second semester student started design process with data gathering and studying similar case studies and done projects with famous architects. Then site analysis and checking about obstacles and opportunities of the site. Then choosing a concept and developing idea to form. All these processes were under supervision of 4 lecturers and took place in crit sessions which were one to one crit, panel discussion or jury sessions.
In all of these sessions instructors were obliged to use a predefined evaluation sheet to leave their comments on this evaluation sheet. Figure 1
These evaluation sheets were included different tasks and criteria based on studio objectives.
On the other hand a simple verbal scale was used for each criterion such as: Fail, Poor, Average, Good and Excellent and a verbal grade description applies to given assessment task[5]
Observations during two semesters has shown that Students in second semester produce 75 percent more design alternatives that the traditional studio with the highest number of alternatives. Figure 2. Producing more alternative solutions will have positive effect on students learning. [4].

<table>
<thead>
<tr>
<th>Fail</th>
<th>Poor</th>
<th>Average</th>
<th>Good</th>
<th>Excellent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

![Figure 1](image1.png) Sample of evaluation sheets defined for second year studio in UKM

Also the positive impact of a larger number of alternatives is reflected in the student evaluations, and this is reinforced by the results of the faculty crits.

<table>
<thead>
<tr>
<th>Number of alternative design solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>SEMESTER 1</td>
</tr>
<tr>
<td>WEEK 1</td>
</tr>
<tr>
<td>WEEK 2</td>
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<tr>
<td>WEEK 3</td>
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<td>WEEK 4</td>
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<td>WEEK 5</td>
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<td>WEEK 8</td>
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<tr>
<td>WEEK 9</td>
</tr>
<tr>
<td>WEEK 10</td>
</tr>
<tr>
<td>Average</td>
</tr>
</tbody>
</table>

![Figure 2](image2.png) Average of alternative design solutions in two semesters in UKM

The obtained results from evaluation sheets illustrate that the averages of given fail and poor marks are 22 and 8 percent less in second semester respectively. Figure 3
In addition excellent, good and average marks, significantly have improved.

![Figure 3](image3.png) the comparison on averages of given marks to students in two semesters

On the other hand given comments by instructors and their satisfaction level reveals that not only students proposed more alternatives but also the founded solutions were in better quality. Jurors believed that it in this way they found more chances to see different perspectives and views of
their design and this has leaded to self criticism before each crit session so using computers can help students to be more aware of complex nature of architecture.

Of course it is undeniable that some students in traditional design studio in first semester produced flashy models and many high quality alternatives so we should confess that powerful visualization tools do not guarantee a better understanding of space or better designs. In fact, they may increase the potential, for students in particular, to become more concerned with creating outstanding models than with the experiential qualities of the space that they are designing. Computer-based modeling will allow good students to produce better designs; it will not turn bad students into good designers.

5 Conclusions

We have found that the use of computers in studio instruction increases the number of alternative solutions to design problems that students are able to produce and in this way we can improve student’s learning level. So it is much better to attempt to guide students to enter into new design world through right direction and path and from main entrance which is traditional design process instead of denying the positive impacts of digital technology on architecture education.

References


