

THE PHENOMENA OF TEACHING CAAD AND MULTIMEDIA IN ARCHITECTURE EDUCATION AT PETRA CHRISTIAN UNIVERSITY

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ABSTRACT

The department of architecture at Petra Christian University has offered CAAD and Multimedia for almost ten years, with particular emphasis on the architectural design studios and the final design studio process.

As the beginner of CAD users, students with different of CAD skills—right after taking the fundamental of architectural CAD and Multimedia—tend to explore and use CAD in many different ways, such as very few students are using CAD as a design tool, and the others as a production tool mainly.

Multimedia has long been firmly conceived, as a great interactive-presentation tool, as an automation within the digital domain of conventional hand-worked animation techniques of presentations. For being the students of 7th and 8th (final) architectural design studios, the crucial issues of creative exploration within a design, simulation, and visualization techniques are of greater importance than those of media—blue prints production information only.

Keywords: teaching, CAAD, multimedia, architecture.

BACKGROUND

Computer Aided Architectural Design (CAAD) and multimedia have been introduced since the year of 1992 in the department of architecture at Petra Christian university. The fundamental of CAAD and multimedia teaching are organized through practiced-lecture course for the fourth semester students—“second-years” undergraduate students. It is a required courses offered in two different kinds of CAD applications that are AutoCAD and ArchiCAD. The students are free to choose the CAD courses to which they prefer to master. It is a course which is accessible to computer beginners : it assumes no prior experience of either computing or design. It is a gate-way to digital architecture design studios right after this basic CAD courses. (see figure 1)

In my course (Archicad), it contents three main sections. The first section is, the principles of Computer Aided-Architecture Design (CAAD) which takes almost half the semester courses, the theoretical and fundamental techniques of using CAD to draw either three dimensional buildings or two dimensional drafting techniques. But the later is less focus in my CAD teaching. The second section, is the digital rendering techniques—one-times class meeting. The students are, exploring the easy and power of rendering techniques of buildings and architecture materials applied to three dimensional CAD buildings, and using different kinds of lightings environment to light the spaces or buildings. The last section is the multimedia¹ architecture—two-times out of fourteen class meetings. The purpose of teaching students with multimedia interactive presentations is let the students always :

1. Organized their works—images, explanations and concepts into one well-formatted story.
2. Make outline or storyboard for the presentations.
3. Prepare or study the stories of presentations.



Figure 1. Curriculum semester 4 th to 8 th
[Adapted from Table of Curriculum Study 2001-2002 Petra Christian University]

¹ Multimedia is an enabling technology that combines computer-generated images—perspectives, animations, virtual-realities—with video and sound for the purposed of interactive presentations. According to Heller, David and Dorohy Heller in Multimedia Business Presentations, page 1-2.

4. Make the presentation more attractive and communicable to audiences.

THE PHENOMENA OF CAD WORKS AND SKILLS

A. CAAD classes

The students come to the CAD courses with a variety and different of enthusiasm, interests, and prior background computer skills : some are very eager to take the course in order to learn new tool for supporting the designs—figure 2 to 8 are few of the representative of one to three students best CAD assignments in each semester class only, on the other hands, some are taking the course just because this is a require course (it has to be passed with a minimum grade of “D”), not an elective computer skill courses.

The consequences could be :

1. Few students really master-well the CAD and multimedia courses.
2. Very few final semester assignment well done—figures 2 to 8.
3. Unsatisfied passing grade marked on some students—figure 9—less serious works done.
4. Cheatings on assignments and examinations happened.



Figure 2. Well done final semester CAD assignment [Adapted from : Goenadi Ongko “Tando Ando House” on CAAD class years 1996]



Figure 3. Well done final semester CAD assignment. [Adapted from : Natalia “Maspion Office Building” on CAAD class years 1997]



Figure 4. Well done final semester CAD assignment. [Adapted from : Peterina “General Hospital” on CAAD class years 1998]



Figure 5. Well done final semester CAD assignment. [Adapted from: Paul Dahong “Cosima Hotel” on CAAD class years 1999]



Figure 6. Well done final semester CAD assignment. [Adapted from : Laurensia Angelia “Showroom” on CAAD class years 1999]



Figure 9. Example of Less serious CAD final semester assignment done. [Adapted from: students works on CAAD class years 2000]



Figure 7. Well done final semester CAD assignment. [Adapted from: Jessie Grace “Villa” on CAAD class years 2000]



Figure 8. Well done final semester CAD assignment. [Adapted from: Jerry Syatriadi “Mill House” on CAAD class years 2000]

B. CAAD Design Studios Works

After mastering the CAD and multimedia knowledged, the students—taking CAD classes on table 1—are welcoming to start using CAD at the architectural digital design studios semester 5, 6, and 7, as well as the final studio.

But the phenomena is few students—less than 10 percents students for each semester design studio—applying CAD and multimedia for designs, even there are none students participating CAD for designs. With the exception for 7th design studio that is the urban design to which each group of students are competitive to use computer—CAD and multimedia—for presentations. (see table 2)

Table 1. Participants of Students Taking CAD Classes

Years	Archi CAD	Auto CAD	SUM
2001	9	28	37
2000	21 (11)	33 (114)	54 (125)
1999	15 (31)	49 (57)	64 (88)
1998	20 (29)	20 (50)	40 (79)
1997	16 (33)	28 (52)	44 (85)

Parentheses are sum of students taking in odd semesters. [Adapted from : observation data for each semester]

Table 2. Participants of CAD Students in Design Studios

Years	Semester 5 th		Semester 6 th		Semester 7 th		Semester 8 th	
	students	CAD	students	CAD	students	CAD	students	CAD
2001	86	6	66	4	66	16	55	4
2000	72 (62)	3 (5)	49 (72)	2 (-)	69 (49)	14 (12)	53 (71)	1 (2)
1999	70 (47)	4 (2)	63 (68)	5 (2)	52 (56)	11 (12)	60 (52)	2 (-)
1998	58 (65)	3 (3)	46 (57)	5 (4)	63 (50)	15 (10)	67 (63)	3 (1)
1997	57 (50)	2 (-)	57 (50)	3 (2)	57 (62)	9 (13)	59 (58)	5 (4)

Parentheses are sum of students taking in odd semesters. [Adapted from: observation data for each semester design studio and final studio]

There are several reasons causing these phenomena :

1. No linkage of program CAD fundamental courses to CAD design studios.

There are no special official arrangement CAD studios from department of architecture; students are freely to apply or not to apply the experiences of CAD for design in studios—very few students participating with design CAD (see table 2).

The advantages :

- the institution do not need to provide lots of computers and software in the CAD design studios (less budgeting).
- the department do not need to provide special room with higher security lock for the hardware and software.

The disadvantages :

- the students do not get the benefit of full-CAD studio environment—designing lots of alternative digital models in design briefs for each week assignments.
- the school of architecture do not have lots of students well CAD-training (traditional environment dominated).

2. Students do not have enough self-confident to applied CAD skills in real CAD design studios. The CAD design group always become the minority group compare with the normal hand design group.

3. Minimum required drawings to submit are probably too much. According to data observed by Francois Penz and Matthew Bourne, department of architecture, University of Cambrige, students are tend to spent more longer working on CAD design then when working by hand².

These phenomena cause most of the students using CAD for producing drawings mainly—less creating alternative designs, then using CAD as a tool for conceptual designs.

Most of examples design studio works shown below are mostly in one alternative but quite thoroughly designed.

Examples of CAD studio works :



Figure 10. An example of 5th CAD studio work—simulated front facade of real building. [Adapted from: Goenadi Ongko “Town House”]



Figure 11. An example of 5th CAD studio work. [Adapted from: Goenadi Ongko “Town Shop”]

On the Final CAD studio (8th), the CAD design users diminish due to the fact that final studio needs longer time to design holistically, and to draw lots of drawings. Only few great experienced CAD students are continue using CAD and multimedia as a tool for conceptual designs, producing final drawings—perspectives, details—as well as multimedia presentations (see table 2).

² Computers in Architecture, tools for design, Longman, page11

On this moment (8th design studio), the CAD design students are really tend to explore deeply the power of the program such as : sun-shading studied—canopy designs, and structure studied. (see figure 15, 16, 17, 18, and 19).

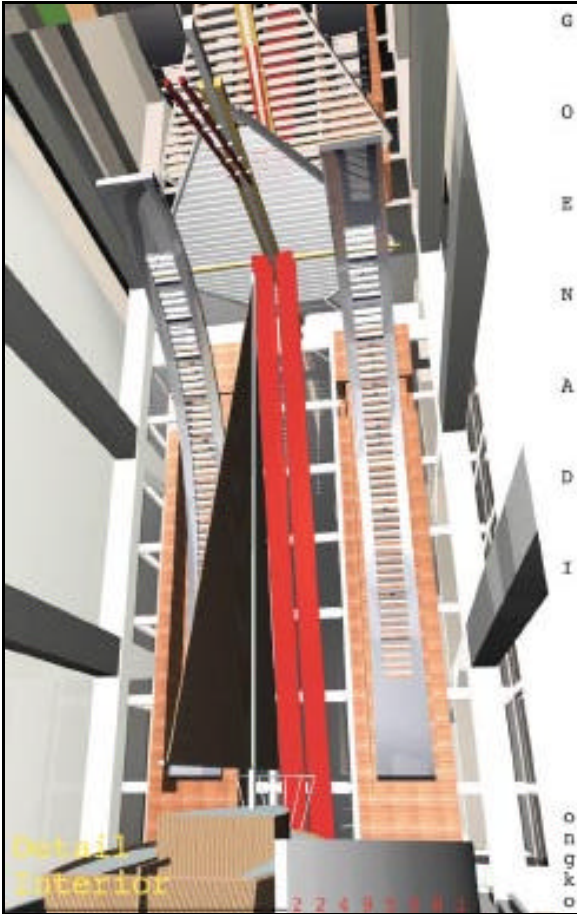


Figure 12. An example of 6th CAD studio work-interior detail. [Adapted from: Goenadi Ongko “Museum”]



Figure 13. An example of 7th CAD personal studio work. [Adapted from: Goenadi Ongko “Hotel”]

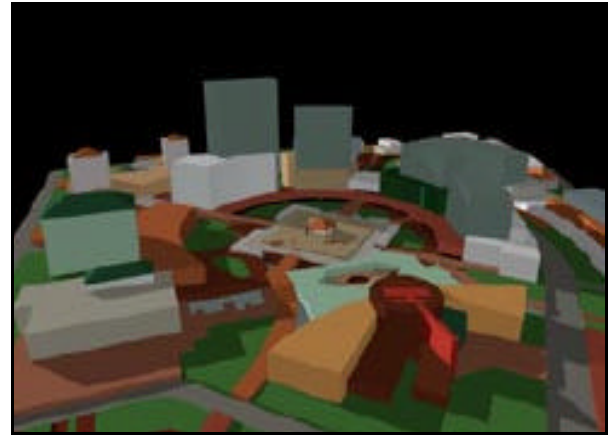


Figure 14. An example of 7th CAD studio work. [Adapted from: Rommy “Super Block—Urban Design”]

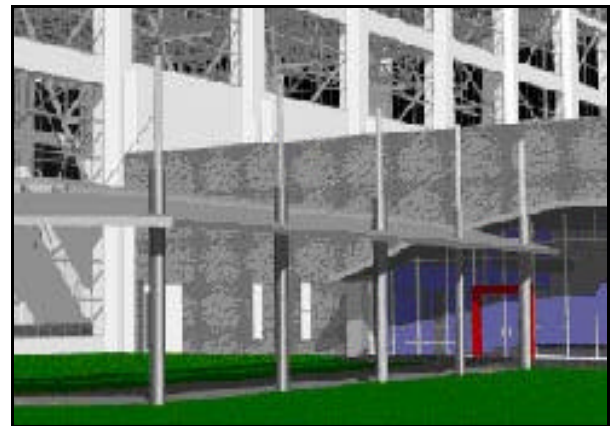


Figure 15. An example of pedestrian canopy type for sun-shading studied. [Adapted from: Rio Judho “Museum of Military Aeroplanes”]

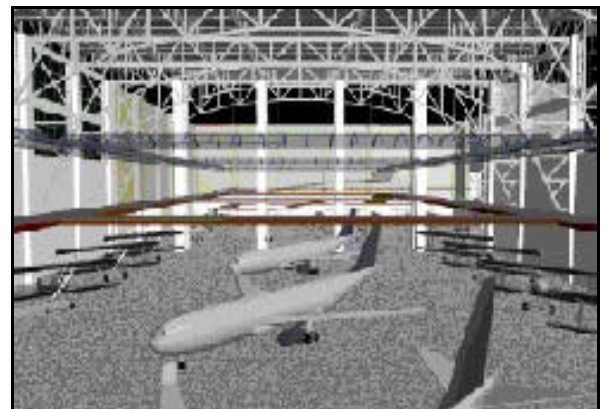


Figure 16. An example inner frame structure studied. [Adapted from: Rio Judho “Museum of Military Aeroplanes”]



Figure 17. Digital Model of front facade building. [Adapted from: Rio Judho “Museum of Military Aeroplanes”]



Figure 18. Main Entrance steel canopy and sun-shading studied. [Adapted from: Suhadi “Agency Center”]

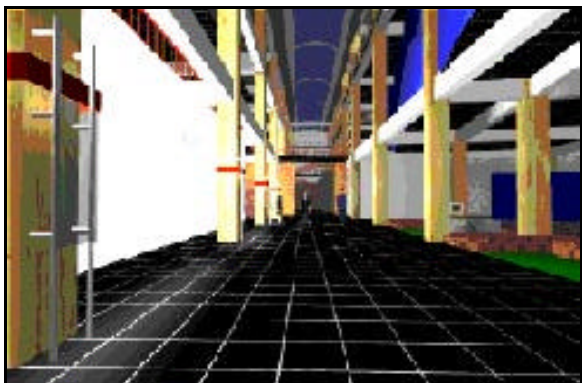


Figure 19. Main inner corridor with skylight and artificial light studied. [Adapted from: Suhadi “Agency Center”]

Even for the landscape element of eyes-catching statue in front of the building was carefully and meaningfully specified to enhance the design. (see figure 20).



Figure 20. Statue detail studied. [Adapted from : Rio Judho “Museum of Military Aeroplanes”]

Nevertheless, very-few less experienced students are dare to try using the CAD in the last design studio, with the purpose for producing final drawings faster. The quality and creativity of the design are usually less important to them, figure 21 shown the least design both in simple geometry shape building and less details on the facades.



Figure 21. An example fornt and side building [Adapted from : final design studio with CAD]

MULTIMEDIA WORKS.

When talking about multimedia, it is true that multimedia has much more interesting than CAD media, just because multimedia is a computer-generated presentation that uses at least some motion or basic animation, recording voice-sound or sound-tract and video to add impact.

A well-crafted multimedia presentation could help two achievements—education and professional, and has several benefits such as :

1. Confidence and image: a good presentation in education—studio works or assignments could enhance the design quality and good prepared personality image.
2. Flexibility: the computerized authoring multimedia tools are easily making changes and layout every minute to suit the presentation stories.

Commonly, the visualization presentation has two types:

1. Interactive presentations
2. Continuous-run presentations

Students have a lot of fun making multimedia presentations, some students either like making interactive presentations at CAD class and design studio, or like making continuous-run presentations. (see figure 22 and 23).



Figure 22. Interactive presentation multimedia
[Adapted from: Tedjo Susanto “5th Design Studio”]

There are bottoms to choose some topics which could forward to the selected topic and backward to this main menu again.



Figure 23. Continuous-run presentation multimedia—described design concepts.

[Adapted from : Suhadi “Final Design Studio”]

There are not bottoms to choose many topics to view, and the presentation run continuously till the end of presentations. Only the paused bottom is available for convenient used.

CONCLUDING REMARKS

What I have tried to address here is the difficult but interesting problem or phenomena using computer as a tool for design in a helpful way during the early stage of the design process, and visualization presentation at the last.

Based on the facts that many students are taking and finishing CAD classes but only few students anticipate to use CAD in design studio as well as final design studio. If there are CAD students, then most of the students use CAD with the purpose for producing drawings—exterior and interior perspectives mainly (interviewed with the students). So, does CAD stand for computer-aided design or computer-aided drafting ? I believe that in our case are going on now it is still the latter. Until there are some changes in CAD programs, policies as well as digital CAD designs environment.

So, I have some suggestions such as :

1. It would be better if the fundamental CAD classes are an elective course; the CAD courses offered are just for the right person or students who really have the strong interests in CAD and related digital domains.
2. The CAD design in studio programs at architecture academic has to be set up as a requirement starting from 5th design-studio to

final studio run in a small separate special group of CAD design studio guided by an architectural CAD supervisor with intent of series of CAD assignments seeking alternative design schemes.

3. Encouraging students to take CAD design studios by giving them full authority to use the computers for doing other assignments than designs in the CAD studios.
4. It needs further research on how does CAD really effect the design creativities.

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