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Learning in Architecture Design Studio

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Abstract

Design Studio is a core subject in architectural course or education at the higher learning institutes in Malaysia and other countries overseas. All other supporting architectural subjects are normally organized to provide contributions towards Design Studio learning. Therefore, a balance has to be sustained between Design Studio and other subjects throughout an architectural course to ensure effective learning. This paper outlines important aspects in Architecture Design Studio and proposes a Bloom Taxonomy for Design Studio learning to ensure the education objectives are met.

Keywords: Architectural education; architectural course; design studio; studio learning; Bloom Taxonomy

1. Introduction

Architectural design covers a wide range of factors beyond the physical and structural aspects of buildings. A good architecture should reflect the life of the community in which it is located. Therefore architectural education is a multi-facetted field due to the complexity of the social and cultural aspect normally associated to it. Architectural education is not restricted to physical building design and also incorporates value system, philosophy, sustainability, technologies and other related areas. Diverse subjects other than Design Studio offered in any architecture courses reflect the complexities integral in architecture. Integration of these diverse subjects with the Design Studio is very important as the architecture course offered should be able to produce innovative, creative and holistic architects who are sensitive to the needs of the society, the environment and technology.

2. Design Studio as the Core Subject in Architecture Course

Compared to other subjects in the architecture course, Design Studio is the most dominant subject with the highest credit hours per week. Other subjects such as Construction Technology, Architectural History and Theory, Environmental Physics, Design Communication and others have to serve Design Studio learning in each semester (Figure 1). In general, Design Studio is meant to provide students with expertise and knowledge necessary in order

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to produce innovative, creative and competent design solutions. The main objective of Design Studio is to develop students' imagination in design and allow them to produce architectural designs that have dialogue and balance between poetic and pragmatic thinking. Design Studio provides architectural students with the skill to work under both intuitive and practical contexts. In Design Studio, students express their architectural ideas and creativities through myriad communication techniques and methods such as in the forms of drawings, physical models, computer models, photography, video clips and others.

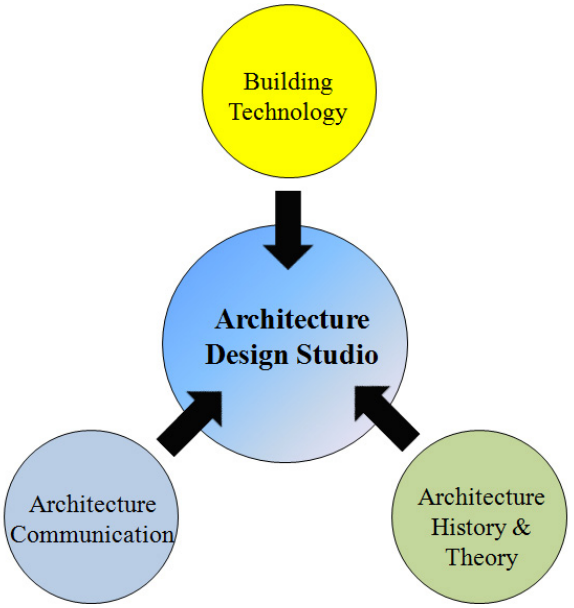

Figure 1. Subjects which supports Architecture Design Studio (the core subject)

3. Learning in Architecture Design studio

The credit hour for Design Studio normally ranges between six to eight hours per week. For an example, at the Faculty of Architecture, University of Sydney and in most other universities in Australia, Design Studio consists of at least 6 credit hours per week; one hour of a lecture session and another five hours dedicated to a studio critic session. The lecture session is normally given by the studio coordinator, assisting lecturer or any invited individual who are related to the design project. The role of the Design Studio critic session is for ensuring that the design processes are well-informed and thus satisfy the project's requirements. Design Studio at the Department of Architecture, UKM also follows this basic architectural education system.

Beginning with a basic and elemental design project in the first year, students will progress and complete their Design Studio in the third or fifth years with a much more complex building projects. Complexity in Design Studio does not necessarily refer to the size of the building project. For an example a medium size theatre design can have a similar complexity with a ten story office building in terms of program requirements (such as acoustics, lighting and others) and its environmental planning.

4. Design Studio Integration with the Support Subjects

In order to ensure architectural students are well equipped to undertake Design Studio each semester, the support subjects in the architecture course need to be well-integrated with this core subject. For an example, the second year architectural students at the University of Tasmania and the University of Sydney, Australia are required to be sensitive to the environmental and social contexts of the design projects given to them. Therefore, the students are exposed to modern and contemporary Australian architecture study in Architecture History and Theory subject.

Similar integrative approach is taken every semester throughout the architecture course. In the third year, technical aspects become more paramount in design therefore assignments and project in Building Technology are normally integrated with Design Studio. Figure 2 shows the integration between Design Studio, Architecture Communication and Architecture History subjects in the first semester, first year at the University of Sydney. The two supporting subjects are not only integrated with Design Studio work but also related to each other.

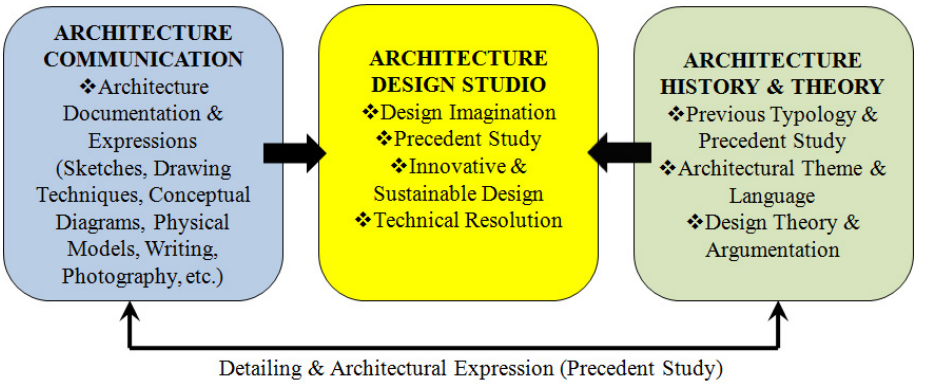

Figure 2. Integration and connection between the core subject and two supporting subjects in the first year of the architecture course at the University of Sydney

The product of good integration between architectural subjects is illustrated in Figure 3. Lessons in building documentation and detailing obtained in the Architecture History subject and Communication subject are utilized in presenting design detailing of students' proposal in Design Studio.

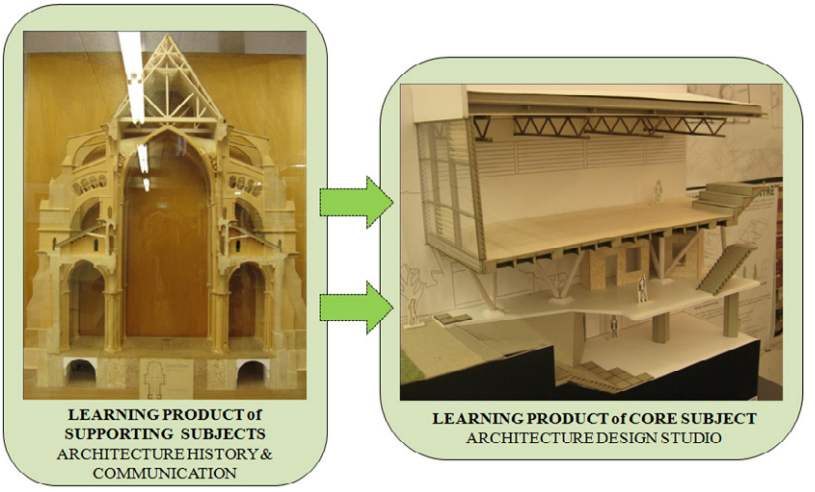

Figure 3. Integration between the supporting architecture subjects can enhance learning in Design Studio.

5. Development of Critical, Creative and Pragmatic Thinking in Architecture Design Studio

Critical, creative and pragmatic thoughts are the main criteria for architecture students undertaking Design Studio. The integration of these three thinking modes is very important in Design Studio learning. The hierarchy and

balance between these three modes of thinking change in accordance to Design Studio levels. In general, creativity is of high importance in the early years for example in the first and second years while pragmatic thinking is more prioritized in the fourth and fifth years. However, this does not mean creativity is not important in these upper years and balance between these three modes of thoughts is necessary throughout the whole architecture course.

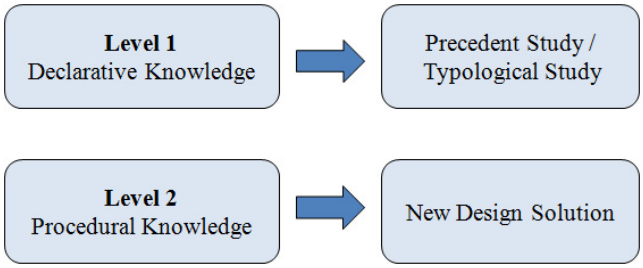

Figure 4. Levels of knowledge indicating critical thinking stage in Design Studio based on the category suggested by Anderson (1993)

Critical thinking is not only important in Design Studio but also in every field of study. According to Postman and Weingardner (1972), the role of higher learning institutes is not only to provide educational information to students but more importantly to prepare them to be critical towards whatever things they learn. A similar opinion is expressed by Letiche (1988) who suggests every student to acquire the skill of 'learning to learn'. Anderson (1993), a psychologist divides knowledge obtained by students into two levels; declarative knowledge and procedural knowledge (Figure 4). Critical thinking according to Anderson can only be attained when a student achieves procedural knowledge. Critical thinking in Design Studio can be said to have been achieved when the architecture students manage to produce new design solutions after mastering previous building types and design solutions.

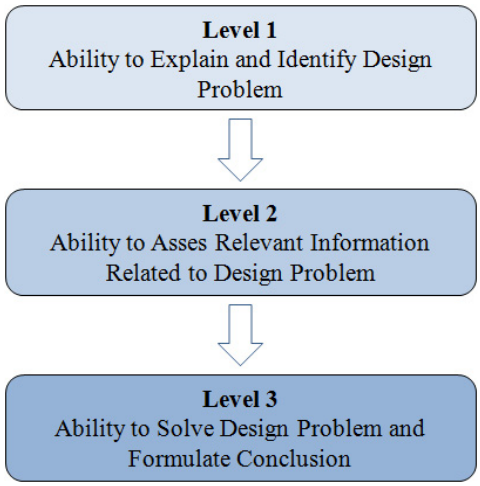

Figure 5. Three main processes towards critical thinking in Architecture Design Studio

Psychologists are not united in their opinions about the process for attaining the skill of creative thinking. However, the process outlined by Kneedler (1985), a psychologist, can be used as a general model for creative thinking. Figure 5 indicates the three processes based on Kneedler's model which is representative to the processes of creative thinking obtained by students in Architecture Design Studio.

At Level 1 (Figure 5), architectural students are able to identify the design problems of their projects. At this level students can compare design issues in the precedent study with the ones they found at the site and subsequently select relevant information which can be utilized in the design proposal. At Level 2, architectural students are able to

evaluate merits of all information acquired in order to resolve the design problems. At this stage, they are able to demonstrate the ability to address the hierarchy of issues. At Level 3, students can produce design proposals which are actually design solutions for the problems addressed. The proposal should demonstrate adequate evaluation and responses to the issues resolved. At this level, the students should also be able to predict the effects of their proposals.

In the other hand, creative thinking is different from critical thinking. According to Sternberg (1985) a psychologist, creativity is produced through utilization of knowledge in a new format or structure. Creativity depends on a broad range of knowledge but it possesses additional qualities of its own; one of which includes the ability to break or depart from a generally known solution. Creativity also includes the ability to restructure a problem in order to achieve a totally new solution. One of its manifestations is the cerebral phenomenon known as the 'sudden solution'. According to psychologists, 'sudden solution' is obtained through the process of incubation of ideas (McInerny & McInerny, 1994). It is a solution achieved via the unconscious thoughts after we leave and stop thinking seriously about a problem for a while. In Architecture Design Studio, this process is not an alien phenomenon and has been experienced by many students. Therefore, the process is regarded as highly important in producing creative design works.

Other than being able to think critically and creatively, architecture students also need to be able to think pragmatically in Design Studio. Pragmatic thinking enables students to conceptualize the constructability of their architectural designs or proposals. Pragmatic thinking can be represented by technical knowledge necessary for constructing the design proposal in the real world and ensure fulfillment of its functional requirements, structural strength, cost effectiveness, safety, comfort and other requirements. Creative and critical thinking enable architecture students to achieve novel and new design solutions in the Design Studio. In the other hand, pragmatic thinking ensures the constructability of the design proposals produced by architecture students.

6. Bloom Taxonomy in Design Studio

As a checklist, the Bloom Taxonomy can be utilized in order to ensure fulfilment of Design Studio learning objectives. The following Figure 6 depicts the Bloom Taxonomy together with the level of qualities which can be attained at various stages in Architecture Design Studio. Conforming to this checklist at appropriate stages of a design project can hopefully ensure students' capability in producing new and original design solutions.

Categories	Explanations	Learning in Design Studio
Knowledge	Knowing the information taught	Knowing the design requirements
Comprehension	Showing understanding of the material; interpreting, restructuring knowledge	Understanding the objectives of the design requirements
Application	Using the information to solve problem	Using the information to execute design or to solve the design problem
Analysis	Critical thinking: identifying cause & motives; making deduction based on facts; making a hypothesis	Critical thinking: identifying /analysing the effectiveness of design components; making design decision based on facts
Synthesis	Original thoughts: original proposal	Proposing new & original design solutions without borrowing literally from precedents
Evaluation	Evaluating merit of the idea, bench marking, formulating conclusions	Evaluating the merit of the proposed design solution (e.g., the effectiveness of space configurations, etc.)

Figure 6. Bloom Taxonomy in Architecture Design Studio

7. Conclusions

Design Studio requires an integrative syllabus to ensure an ideal learning process for architecture students. All supporting subjects in the architecture course have to be properly integrated to ensure conducive learning in the Design Studio. Part of the learning objectives in Architecture Design Studio is in producing architectural students skilled in critical, creative and pragmatic thinking. The Bloom Taxonomy together with the proposed stages of students' knowledge attributes can be utilized as a checklist towards attaining the learning objectives of Architecture Design Studio.

Acknowledgement

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