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Collaborative Facets in Design Studio: Towards Establishing a Design-Driven Learning Framework

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ABSTRACT

The influenced of contemporary conditions such as climate change, urban migration, technological advancement, Information and communication technology (ICT), may obligate a transformation in architectural design education where Information and Communication Technology (ICT) might take the significant role for the transformation. Designing been a fundamental activity that supports the introduction, development and implementation of products, services, practices, and systems; greater understanding of the methods, strategies, and tactics employed by designers in facilitating design activities should enable us to uncover certain unique characteristics of the design process. This study expounds research possibilities based on a Design-driven Learning (DDL) Framework by examining exemplary cases in architectural education. Through current literature review, the study has identified DDL as a learning process that entails progressive and productive cognitive and behavioral transformation during knowledge integration between stored, reflective and generic domains of knowledge. The study found that the studio environment provides students with high imaginative potential and score excellent results. Further study can investigate between two groups of student designers working in a different environment.

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COLLABORATIVE FACETS IN DESIGN STUDIO: TOWARDS ESTABLISHING A DESIGN-DRIVEN LEARNING FRAMEWORK

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Abstract

The influenced of contemporary conditions such as climate change, urban migration, technological advancement, Information and communication technology (ICT), may obligate a transformation in architectural design education where Information and Communication Technology (ICT) might take the significant role for the transformation. Designing been a fundamental activity that supports the introduction, development and implementation of products, services, practices, and systems; greater understanding of the methods, strategies, and tactics employed by designers in facilitating design activities should enable us to uncover certain unique characteristics of the design process. This study expounds research possibilities based on a Design-driven Learning (DDL) Framework by examining exemplary cases in architectural education. Through current literature review, the study has identified DDL as a learning process that entails progressive and productive cognitive and behavioral transformation during knowledge integration between stored, reflective and generic domains of knowledge. The study found that the studio environment provides students with high imaginative potential and score excellent results. Further study can investigate between two groups of student designers working in a different environment.

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1. Introduction

Students of Architecture usually carry out their design project alone without collaborating with other AEC disciplines. However, in real life practice design is a collaborative responsibility of AEC disciplines. Then why it is not so to design learning? Why is design learning contrary the design practice? Eventually, the dichotomy creates a lack of designers' ability to learn how to effectively collaborate with other disciplines as required by some of the contemporary design conditions.

With the current proliferation of Building Information Modeling (BIM) across the world, the next generation of architects and designers are expected to have a wide range of knowledge and skills of collaboration. Collaborative teamwork has a significant impact on the implementation, networking, learning, understand, communication and representation on BIM. The knowledge and skills of collaboration will help design

students to effectively participate in the modern construction world as proliferated by the BIM concept. Therefore, there is the need to have a collaborative design learning among AEC students (8). Likewise, this study examined the conventional design learning environment and proposed the DDL framework to explore the role of collaboration in design learning. Potentials designers are expected to be familiar with multidisciplinary criticism, consultation, and knowledge. Therefore, to achieve integrated project delivery and innovative ideas among potential architects and engineers, there is the need to have a collaborative design learning system that will serve as a networking tool for building designers (6; 10). Students will learn how to use and manage latest information and communication technology (ICT) tools that will foster development and progress in team practices. They can also develop their problem-solving skill where necessary.

2. Literature Review

The influenced of contemporary conditions such as climate change, urban migration, technological advancement, Information and communication technology (ICT), obligates a transformation in architectural design education where Information and Communication Technology (ICT) taken a significant role in the transformation (12). Architectural design education should be a collaborative system where design learning should include students and tutors of other disciplines like engineering and quantity surveying (12) (5). There is the need to develop and adopt a proper architectural design education strategy that will ensure effective collaboration among students and tutors of other disciplines like engineering and quantity survey. The architectural education will then serve as a medium that provides design student with the required skills and experience of managing collaborative process even before graduation. Adequate integration of some collaborative parameters into the current design learning strategy might be a way forward (12; 3; 9).

Being a fundamental activity that supports the introduction, development and implementation of products, services, practices, and systems, the greater understanding of design learning methods, strategies, and tactics employed by designers in facilitating design activities can lead to some unique characteristics of the collaborative process, particularly in design learning. However, conventional design learning offers a pedagogical approach as opposed to the 'grounded' outlook of the dedicated design practice. These led to the further disintegration of the design learning among the AEC related disciplines. For example, design learning circumscribes under the pedagogical framework of problem-based learning. These contrasts the view of more established design researchers who consider the design paradigm as markedly different from the problem-based

framework. Therefore this study expounds a Design-driven Learning (DDL) Framework after examining the architectural design learning environment. Video recordings and subject interview are employed to elucidate the use of DDL parameters in the design case study. The study is expected to capture and measure collaboration in the reflective world of the DDL environment, and also to open up possibilities for future studies in Collaborative design learning.

Literature established that design learning was originated in the 1950s, in the Bauhaus school of Design Germany, under the nomenclature of Studio-Based Learning (SBL) (3). From Germany, the SBL was copied and adopted and distributed by Ecole des Beaux-arts in Paris in the same century. The studio is the environment that offers design learning course for Art and Architectural students. The studio set-up provides the student with a deeper knowledge of design and self-oriented problem-solving training in design fields of Architecture, Landscape Architecture, Interior Design, and Industrial Design. A studio is a place where students are assigned a task to generate and present the solution for the given task using continuous iteration of concepts until the design concept is refined and communicated. Therefore, the introduction of the studio in design learning provides a dynamic space where designers learn how to develop their design skills. The design studio is considered to be a professional way of learning design with the aid of an expert designer as Supervisor, Master or Teacher. Collaboration works are expected to be innovative and efficient when compared with the work of lonners. Collaboration fosters the development of integrated projects, testing, and adoption of new ideas. Therefore integrating collaborative studio learning across the AEC disciplines is important (6; 4). Literature studies carried out across Europe, Asia and the USA (13; 1; 2) on collaborative teamwork across the AEC

disciplines has to prove to be an important aspect of a learning platform for the AEC disciplines. Other studies indicated some universities have developed and adopted their collaborative design course (11; 13; 7; 2).

3. Research Methods

The aim of this research is to investigate and identify the collaborative method in design learning for the potential contemporary collaborative design learning. Among methods of studying design, activities are protocol studies using protocol observation and interview. The proposed methods for this study includes; content analysis, close group discussion, and protocol coding. Protocol study was chosen as the research methodology for this study because of its ability to study design activities through behavior, verbalization, and gestures. Protocol analysis is a widely used technique to study design processes found in architecture. The study observed an experiment that involves a design studio class. The study used stages of experimental design, subject recruitment, conducting experiments, transcribing protocols, coding schemes, quantitative and qualitative comparisons and the final result outcome. The three different research methods use for this study includes close group discussions, literature review, and observation. Through these methods, the study background was setup and tested. The observation consists of the subjects (students and design tutors), design task, supporting tools, and studio environment. The proposed subjects are architecture students and design tutors.

4. Analysis & Results

The retrospective observation of the studio activities and subject interviews revealed some unique features of collaboration during the design learning. The identified features include progressive and productive iterations and knowledge interaction. The analysis also indicates that design learning is a working system that involves developing solutions to real life problems

through the interchange of knowledge. Collaboration between tutor and students is a major medium of design learning.

Table 1. Collaboration in design learning environment (DDL)

Collaborative facets	Examples
Progressive Transformation	
Create idea	Generate (I ¹)
Evaluate idea	Simulate (I ²)
Implement idea	Develop (I ³)
Productive Transformation	
Directive feedback	Correction (F ¹)
Corrective feedback	Improve (F ²)
Review feedback	Reduce (F ³)
Guidance feedback	Instruct (F ⁴)
Iterations	
Prototyping	Staging (T ¹)
Scaffolding	Linking (T ²)
Knowledge Integration	
Stored Knowledge	Abstract ideas (K ¹)
Reflective Knowledge	Experiential ideas (K ²)
Generic Knowledge	Product (K ³)

5. Discussion & Conclusion

The DDL framework (Figure 1.0) is aimed to serve as a design learning strategy that entails collaborative parameters such as progressive and, productive transformation and knowledge integration (stored, reflective and generic domains of knowledge). Stored knowledge is the abstract knowledge; reflective knowledge is the exploration, refinement, and synthesis. Generic knowledge is the artefact. The video observation and subjects interview validation established certain unique features of collaboration during knowledge integration process. The collaborative parameters emerged during knowledge reflection of tutor and students. Such archetypical collaborative ‘mode’ lends itself to our important ‘unit of research inquiry. It encompasses the study and measure of design thinking patterns, design problem-solving iterations, ideation and conceptualization processes as well as feedback. This study has found collaboration as a system that channel effective knowledge transformation

between tutors and students in a typical DDL environment of Architectural higher education.

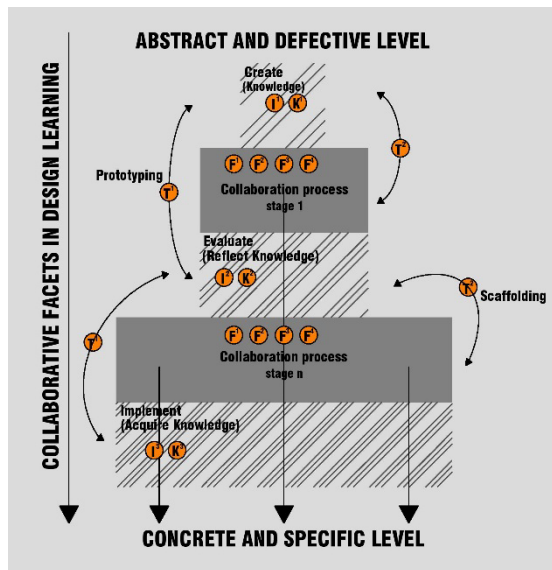


Figure 1.0 Design-driven Learning Framework (DDL)

The process of knowledge integration is the infiltration of abstract knowledge and reflective knowledge in generating generic knowledge. These process of infiltration and generation occurs when a designer (student) uses imagery to access abstract knowledge in generating design concept, and further use perception and experience as reflective knowledge to refine, explore and synthesize the initial concept of the design to achieve the outcome of the design as the generic knowledge. The iterations facilitate refinement, syntheses, exploration and some premature resolution during presentation and consultation.

The interview also established that all both students and tutors agreed that collaboration in the design learning environment improves their knowledge and skills of solving design problems better than a non-studio environment. Further studies on two group of student designers working in a different environment is a potential area of future research. The environment that elicited high score will be more suitable for a potential collaborative design learning environment.

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