PRESERVING TRADITIONAL BALINESE ARCHITECTURE THROUGH ARCHITECTURAL EDUCATION IN FACING THE CHALLENGES OF GLOBALIZATION

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Abstract

Tourism and globalization have significant effects on Bali's cultural and physical landscape. Both affect the physical appearance of cities, villages, settlements and residential and also the way Balinese think about space and their environment. The villages transform from rural area with strong rural characteristics into urban area with urban or mix characteristics. Some buildings were built without regard to Traditional Balinese Architecture principles but following the global architectural trend, especially in the urban area and tourist destinations. Space and environment that was once seen as an integral part of *Bhuana Agung* (macro cosmos) and *Bhuana Alit* (microcosmos, human body and soul), now are seen merely as tools for capital accumulation. Facing these facts, local government, such as provincial and city government, has passed legislation regarding building code and spatial regulation which requires every building must be in accordance with the Traditional Balinese Architecture. This move also followed by some universities in Bali that have Architecture Department have already integrated Traditional Balinese Architecture into their curriculum as an effort to preserving the knowledge of Traditional Balinese Architecture. This article is trying to find out how Traditional Balinese Architecture is integrated into the curriculum and what is the learning method and learning outcomes, as a way of preserving the knowledge of Traditional Balinese Architecture. The method used is literature review by describing and examining the curriculum, learning method and learning outcomes in two universities in Bali. The findings are: the knowledge of Traditional Balinese Architecture is well preserved through transfer of knowledge and studio assignments for students. Student assigments are visualization of *lontar* and tradisional design process and finally, design a new tradisional building. These assignmentsensure the students to understand the "know-how" of Tradisional Balinese Architecture. The assignmentsthen recorded in digital format so it can be transferred to future generations.

Keywords : *Traditional Architecture, Balinese Architecture, Design Studio, Architectural Education*

PRELIMINARY

Traditional Balinese Architecture has philosophical, ethical and ritual values which are essentially aimed at creating a harmony of the natural environment for the balance of human relations (microcosm) with the universe (the macrocosm) and the Creator. As a knowledge, Balinese Traditional Architecture is a manifestation of space and a place of life for Balinese people who follow the rules passed down through traditional literature or *lontar* such as, *Asta Kosala-kosali, Asta Bumi, Asta Patali* and others. Traditional Balinese Architecture that comes from the philosophy, ethics and rituals of Hinduism, is a cultural manifestation, that traditional Balinese building values and rules are greatly influenced by the norms of Hinduism, local wisdom and taste of art adapted to the conditions of the local community. (Gelebet, et al., 1986; Dwijendra, 2008; Uthama, 2015).

The concepts of Traditional Balinese Architecture in terms of architectural thinking including*Sanga Mandala*, *Tri Angga*, and *Natah*, while the concepts of Traditional Balinese Architecture that can be included in seen architecture are scale and proportion, structure, material and ornaments. Four categories of scale and proportion, structure, material and ornaments can be grouped in the *Tri Angga* concept. Comparison between knowledge of traditional Balinese architectural concepts and *Asta Kosala-kosali* isvery important because both are grand theories in traditional Balinese architecture. (Gantini, et al., 2012)

In an effort to continue the knowledge of traditional Balinese architecture to the next generation, the knowledge of traditional Balinese architecture is included in the higher education curriculum at universities that hold architectural education through architecture department. The curriculum on traditional Balinese architecture is divided into several courses with certain credit burdens.

Traditional Balinese architecture has become relatively less attractive today, due to the influence of globalization and tourism that bring architectural trends from outside Bali. Many buildings are found that do not use the principles of traditional Balinese architecture, especially in urban areas. Based on this, the government issued a number of regional regulations requiring each building to be built using Balinese Traditional Architecture.

This paper tries to express efforts in preserving Balinese Traditional Architecture through learning in higher education. Case studies used are architectural education in the Architecture Department of Dwijendra University and Udayana University.

THE METHOD

The method used in this paper is literature review on learning documents related to Traditional Balinese Architecture. Interviews were also conducted to educators/lecturers to gain a more thorough understanding of the processes and substance of traditional Balinese Architecture courses in their respective architecture department.

A BRIEF HISTORY OF ARCHITECTURAL EDUCATION

Architecturaleducation that exists today is a relatively new phenomenon. The architecture was initially taught in the framework of an "apprenticeship system" which depends on the transfer of knowledge and information between the teacher and students. The situation changed when architectural education adopted a more academic form. Academia di San Luca (named after the patron saint of painters, St. Luke) in Rome, teaches "*meaning del disegno*", a Vasari term, whose theoretical lecture on geometry. In the early nineteenth century, France added outlook in the field of architectural education with the establishment of schools to train architects, the École des Beaux-Arts. During the following century, architectural education was slowly embedded in the higher education system. The history of architectural education can be mapped as a progressive movement to transfer knowledge from the workspace into the studio. Over the years architectural education has evolved several different systems but overlapping. France introduced an organized formal architectural education

system, followed by Germany which introduced the concept of research in teaching architecture, and the United States which combined the two systems with the overlapping concept of apprenticeship inherited from England. (Tzonis, 2014; Bhattacharjee & Bose, 2015).

The gap between theory and practice in architectural education is covered with real cases study in the design studio. The design studio was at the core of architectural education since its inception in the nineteenth century. Generally, studio lectures still apply traditional models of design processes, but some have been replaced by advances in computational-based technology. This development confirmed the way to obtain a type of practice that included a cross-disciplinary collaboration and communication mindset. Fundamentally, the openness of the design studio structure can effectively accommodate the experience of contemporary architecture through several series of learning dialogues. (Charalambous & Christou, 2016)

Traditional Balinese Architecture Courses at Dwijendra University

Briefly, the Architecture Department of Dwijendra University originated from the College of Traditional Balinese Architecture, then on 28 July 1982 merged into Dwijendra University and received government recognition by granting registered status based on the Decree of the Minister of Education and Culture. (Anon., 2019).
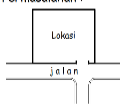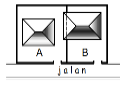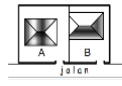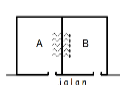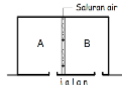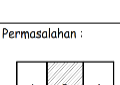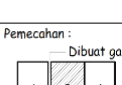
Knowledge of Traditional Balinese Architecture in the Architecture Department of Dwijendra University is taught through a series of Traditional Architecture Studio courses with a total of 13-semester credits. Traditional Architecture Studio 1 course is taught in the 5th Semester with 3 course credits, the course in Traditional Architecture Studio 2 is taught in the 6th Semester with 3 course credits. Traditional Architecture Studio 3 course is taught in the 7th Semester with a load of 4 course credits. These three courses are studio courses, so students are required to attend lectures and do assignments in the studio.

Each course in Traditional Architecture Studio has different emphases. Traditional Architecture Studio 1 has an emphasis on the concept and order of dimensions of traditional Balinese architecture and its application in the form of studio assignments. Traditional Architecture Studio 2 has an emphasis on planning, programming, design, construction and completion of traditional Balinese architectural buildings. Traditional Architecture Studio 3 has an emphasis on designing integrated and conceptual Balinese Traditional Architecture. (Anon., 2015).

Learning outcome in Traditional Architecture Studio 1 (SAT 1) is able to recognize and understand the dimensions of measurement in Balinese Traditional Architecture. In order for students to be able to achieve the expected goals, students are given two forms of tasks which have to be done in the studio. The first task is to summarize and translate the contents of *lontar* related to the size and dimensions used in traditional Balinese buildings in Indonesian language and visualize them with computer graphics / CAD (Computer Aided Design). *Lont*ar that can be summarized and visualized by students include *Asta Bumi*, *Lontar Asta Kosala*, *Lontar Asta Kosali*, *Darmaning Undagi* and *Lontar Swakarma*. Students are encouraged to look for *lontar* to various regions to obtain various versions of *lontar* because each *lontar* with the same title can be written in various versions. The second task is to redraw a traditional Balinese building complete with traditional sizes and dimensions, as well as perspective images or three-dimensional models. This second task is done with computer graphics (CAD) and is presented in A3 paper size report. (Wijaatmaja, 2018).

Figure 1 One example of student assignment of Traditional ArchitectureStudio 1
Source: (Mudita, 2018)

Learning outcomes in Traditional Architecture Studio 2 (SAT 2) is that students are able to understand, explain about planning, programming, design, construction and completion of traditional Balinese architectural buildings. In order for Learning outcomes to be achieved, students are given the task of finding an object of traditional Balinese buildings and explaining about the planning, programs, design, construction and completion of objects of traditional Balinese architecture buildings. This task can be done by hand sketching or with computer graphics / CAD software. (Suardana, 2015).

Learning outcomes in Traditional Architecture Studio 3 (SAT 3) is that students are able to design integrated and conceptual Traditional Balinese Architecture through several stages of design starting from analyzing the site, formulating design concepts and producing designs according to the requirements and design criteria of Traditional Balinese Architecture. Students are trained in their ability to design a building or a group/complex of traditional Balinese buildings carried out independently under the guidance of a lecturer. The scope of the design of traditional architecture includes site design, design concepts, and developing designs to the pre-design and design reports that consider the rules of Traditional Balinese Architecture. The final output of the Traditional Architecture Studio 3 course is a report on the design and mock-up of traditional Balinese buildings. (Suardana, 2015)
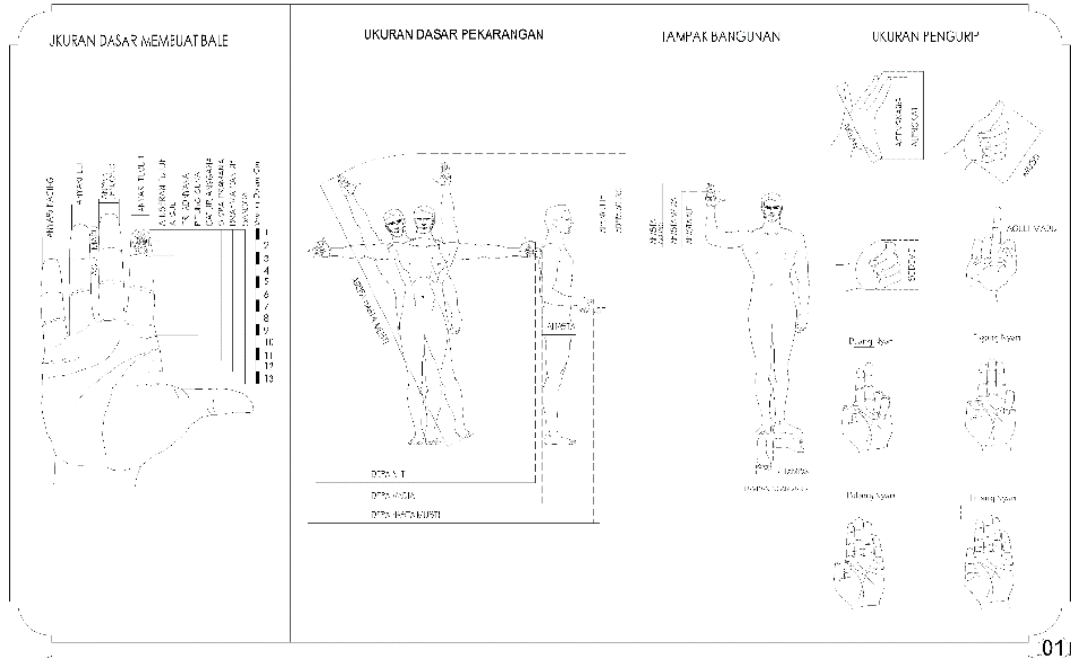
Figure 2 One of the student assignments of Traditional Architecture Studio 2
Source: (Putra, 2014)

Figure 3Student assignments of Traditional Architecture Studio 3
Source: (Sukma, 2019)

In summary, the subjects of the Traditional Architecture Studio in the Architecture Department of the Faculty of Engineering, Dwijendra University, can be summarized with the table below.

Subjects	Semester	Amount of Credits	Learning outcomes	Studio assignment and outcome
Traditional Architecture Studio 1	5th	3	Students are able to recognize and understand the dimensions of measurement in Balinese Traditional Architecture	1. Lontar visualization charts 2. Drawing of traditional Balinese buildings completed with traditional Balinese sizes and dimensions.
Traditional Architecture Studio 2	6th	3	Students are able to understand and explain about planning, program, design, construction and completion of traditional Balinese architectural buildings	1. Graphic of development processes according to the rules and concepts of Traditional Balinese Architecture
Traditional Architecture Studio 3	7th	4	Students are able to design integrated Traditional Balinese Architecture and conceptual through several stages of design starting from analyzing the site, formulating design concepts and producing designs according to the requirements and design criteria of Traditional Balinese Architecture	1. Reports on the design of traditional Balinese buildings 2. Mock-up of traditional Balinese buildings that have been designed.

Table 1. Comparison of Traditional Balinese Architecture coursesat Dwijendra University
Source: Wijaatmaja, 2019.

Traditional Balinese Architecture Courses at Udayana University

The Architecture Department of Udayana University was established on October 1, 1965, and became the forerunner to the establishment of the Faculty of Engineering based on the PTIP Ministerial Decree. Lectures related to Traditional Balinese Architecture are taught in three subjects namely: Balinese Architecture 1, Balinese Architecture 2 and Balinese Architecture 3.

Balinese Architecture 1 (AB 1) is taught in the 2nd semester with 2 course credits. This course is not in the form of studio courses, but the assignments given are similar to studios. In this course, students are given the assignment to finding a traditional Balinese architectural objects. The object is then documented and drawn with a hand sketch. Drawings that must be drawn are building plan, elevations, sections and perspectives.
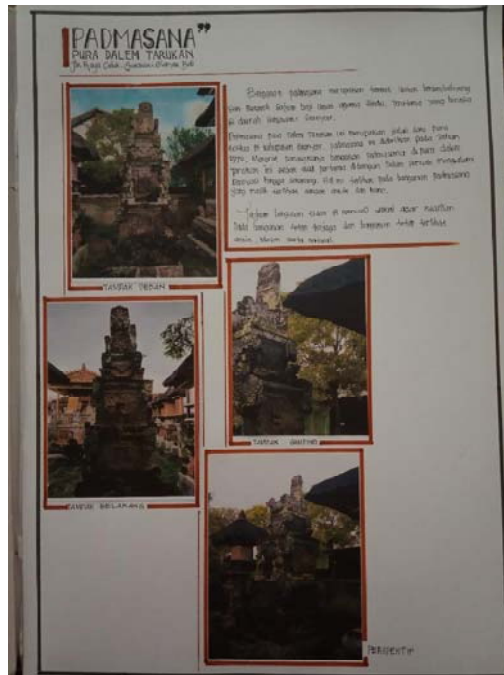
Figure 4 One of student assignment of the Balinese Architecture1
Source: Abdurohman Wafi

BalineseArchitecture 2 (AB 2) is taught in the 3rd semester with 2 course credits. This course also does not take the form of a studio course, but the student assignments given are similar to studio assignments. The student assignment of Balinese Architecture 2 is related to the traditional dimensions of Traditional Balinese Architecture. Students are required to design a building using traditional/anthropometric dimensions of each student.

Balinese Architecture 3 (AB 3) is taught in the 4th semester with 3 course credits. The learning outcomes of this course is students are able to understand the theory of basic knowledge and apply the values and principles of Traditional Balinese Architecture to the Present Architecture proportionally, harmoniously, holistically and contextually. The studentassignment in the Balinese Architecture 3 course is to write scientific papers on the application of the values and basic principles of residential and public facilities of Traditional Balinese Architecture in Present Architecture through exploring the case study objects.

Figure 5 One of student assignment of Balinese Architecture 3
Source:

In summary, the courses of Balinese Architecture in the Architecture Department of the Faculty of Engineering, UdayanaUniversity, can be summarized with the table below.

Course	Semester	Amount of Credits	Learning Outcomes	Studio Assignments
Balinese Architecture1	2nd	2	Students are able to recognize traditional Balinese buildings	1. Documentation and hand sketches of traditional Balinese building/architecture
Balinese Architecture 2	3rd	2	Students are able to recognize, understand dimensions in Balinese Traditional Architecture	1. Designing traditional Balinese buildings with traditional dimensions of Balinese Architecture
Balinese Architecture 3	4th	3	Understand the theory of basic knowledge and apply the values and principles of Traditional Balinese Architecture to the Present Architecture proportionally, harmoniously, holistically and contextually	1. Writing scientific papers on the application of values and principles basic principles of occupancy and public facilities of Traditional Balinese Architecture in Present Architecture through exploring case study objects

Table 2. Comparison of three traditional Balinese Architecture courses at Udayana University
Source: Wijaatmaja, 2019.

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CONCLUSION

Traditional Balinese Architecture taught at Dwijendra University is in the form of a design studio, with topics ranging from size and dimensions of traditional architecture, design process, and design of traditional Balinese buildings that follow the rules of Traditional Balinese Architecture. The range of assignments from each subject is diverse, including graphical visualization of *lontars*, student papers and traditional building mock-ups. Studio assignments are completed with computer graphics / CAD (Computer Aided Design).

Traditional Balinese Architecture taught at Udayana University is in a non-studio form, with the topic of the introduction and understanding of traditional Balinese buildings, traditional Balinese dimensions, and the application of Traditional Balinese Architecture to Present Architecture. Student assignments are completed with hand sketches and computer graphics / CAD.

The difference between both universities in terms of teaching Traditional Balinese Architecture can be summarized in the table below.

	Dwijendra University			Udayana University		
	SAT 1	**SAT 2**	**SAT 3**	**AB 1**	**AB 2**	**AB 3**
Semester	5th	6th	7th	2nd	3rd	4th
Amount of Credits	3	3	4	2	2	3
Forms of learning	Studio	Studio	Studio	Lectures & assignments	Lectures & assignments	Lectures & assignments
Lecture topics	dimensions of Traditional Balinese Architecture/buildings	traditional Balinese Architecture design and development process	designing traditional Balinese building	discovery and documentation of traditional buildings	designing with traditional Balinese dimensions guideline	dpplication of traditional Balinese architecture in contemporary architecture
Assignment output	visualization of traditional *lontar* & building drawings with traditional dimensions	visual charts of a traditional Balinese building design process	design report and mock-up of traditional Balinese buildings	documentation and sketches of traditional Balinese	drawings designed of traditional Balinese buildings	paper on the application of Traditional Balinese Architecture to Present Architecture.

Table 3. Comparison of Traditional Balinese Architecture courses at Udayana University and Dwijendra University

Source: Wijaatmaja, 2019.

The amount of credits ofcourses in Traditional Architecture Studio at Dwijendra University is greater than similarcourses at Udayana University. Traditional Balinese Architecture courses taught at Dwijendra University has a more traditional approach which refers to the *lontars* (traditional scripture) than similar courses being taught at Udayana University which seeks to apply traditional Balinese architecture on the present architecture.

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The preservation of traditional Balinese architecture through architectural education has been well structured and systemized, although there are slight differences in the subject matter of the courses at each university. Hopefully, the courses taught at both universities can answer the challenges of globalization which tends to undermine local wisdom. The teaching of Traditional Balinese Architecture has used computer and digital tools that enable the digitization of Traditional Balinese Architecture knowledge so that this knowledge can survive the challenges of the times and can be passed easilyon to future generations.

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