Making Merit Through Architecture: The Design Build Program at INDA

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Abstract

Many schools of Architecture around the world allow students to take part in a real-world project by designing and making a small-scale building known as a Design Build project. At INDA, the International Program in Design and Architecture at Chulalongkorn University in Bangkok, Thailand, the Design Build program extends across 2 summer semesters. Students start with a small-scale project to learn about production techniques, then move on to a small-scale building to learn about the social benefits of architecture and how it can support a local community. This is a reflection of the Thai (Buddhist) ideal of Making Merit, of bringing benefit to both parties through the act of giving.

keywords: Architecture, pedagogy, Design-Build

Making Merit through architecture: The Design Build Program at INDA

The predominant career path for architects today begins with a degree from an accredited institution followed by employment with a registered architect, after which candidates are eligible to sit exams to qualify for registration.   The previous apprenticeship system has all but disappeared as most countries see the need for a University degree as a necessary foundation for professional practice.

Thus, architecture begins with a concentrated focus on learning, where students understand the broader social and cultural meanings of the profession at the same time as developing skills and knowledge under the supervision of leaders in the field. These leaders can be prominent architects with professional experience but are more likely to be academic leaders as demonstrated by research output through grants and publications.

By learning about architecture at University, students are freed from the contingencies of any particular project such as time and budget restrictions, planning constraints, or client requirements. Students are also able to explore their own design approach rather than having to follow the one favoured by an employer. At University, students are able to develop their ideas in a hypothetical manner where they can explore possibilities that might not be possible with a real project. This also gives students time to consider the broader social and cultural meaning of their architectural ideas. To miss out on real world constraints can be a problem. As Till (2009) argued, such constraints are a necessary part of practice and can provide a source of inspiration for generating architectural ideas. However, it is assumed that students will learn to deal with such constraints when they work in an architectural office after graduation. But there is one set of constraints that students must be familiar with if they are to develop the full range of competencies necessary for an architect. That is the physical constraints presented by real building materials and by real construction processes. This is necessary not only for conveying to others the required outcome through the preparation of construction details, but for realizing the full poetic potential of any particular material and that way that it used or expressed in the completed project.

Many schools try to overcome this by providing workshop facilities for students, where they can create project models or experiment with construction materials and techniques. Examples include robotics, large scale 3D printing, CNC cutting, vacuum forming, and so on. This enables students to understand how materials can be shaped and finished, but it doesn't fully reflect the complexities of an on-site construction process.   And while site visits are quite common in architectural schools, allowing students to actually take part in the construction process is limited by site safety issues and labor regulations, and the time schedule of construction projects does not readily correspond with teaching semesters.

Learning about construction is not just part of the knowledge base for architects. Through acts of making, architecture students can feel how tools are an extension of the human body, enabling the transformation of real material into the expression of an idea.   In this way making is a particular type of knowledge, a negotiation between the maker and physical world. As Crawford (2009) writes, this type of

embodied knowledge is an essential part of the craft of architecture. "Craftsmanship means dwelling on a task for a long time and going deeply into it, because you want to get it right."

Various schools of architecture around the world have managed to include real world projects as part of the curriculum. Many US schools have design build programs, such as Yale, Parsons, and Virginia Tech, but Perhaps the most widely known is Rural Studio at Auburn University in Alabama, founded in 1993 by Samuel Mockbee, and D K Ruth. These programs extend the learning experience out into the community by making civic projects that demonstrate the social value of architecture.

The Design Build Program at INDA

In Thailand, Schools of architecture regularly undertake community outreach programs, often on a voluntary basis. For the Thai students, this forms part of the Thai cultural tradition of 'Making Merit', based on the Buddhist precepts of doing good for others in order to achieve personal growth toward enlightenment. At INDA, this idea of giving to others and to create new social value through architectural education has been formalized in the curriculum through the summer design build program. INDA is the International Program for Design and Architecture at Chulalongkorn University in Bangkok, Thailand, started in 2006 as one of a number of international programs across the university. The school currently has around 300 students and is taught by around 10 Thai and 20 foreign nationals.

According to Tripitaka Buddhist scripture and the Kammic theory, the practice of Buddhists places an importance on 'actions', that is an ethos, a rubric most relevant to the quest for merit (Keyes & Daniel, 1983). In general terms, 'Making Merit' or 'tum Bun' (ทำบุญ) in Thai and Lao, means the act of goodness which is rooted from Punyya (ปุณฺย) in Sanskrit or Puñña (ปุญฺญ) in Pali. More specifically, it can be understood from three different perspectives including 1) causal perspective which equates merit-making to the act of goodness and the avoidance of wrong-doing 2) output perspective which equates merit-making to rejoice or happiness and 3) conditional perspective which equates merit-making to the process of cleaning and purifying one's mind (Ministry of Culture, 2016; Keyes & Daniel, 1983)

Altogether, the process of making merit is intended to eradicate sadness and desires that are imbued within the mind, leading to self-elevation and personal growth such as reduction of selfishness, material needs, desires and other causes of sufferings. In other words, making merit frees one's mind from the material world, preparing oneself to contribute goodness to others in the larger society.

Although in the South and Southeast Asia, prevailing conception of merit-making is equated mainly with religious actions, other modes of action can still be considered 'merit-making' to a significant degree. As written in the Tripitaka Buddhist scriptures, merit can be acquired through many approaches known as the '10 Punnakiriya-vatthu'* or the principles of meritorious action (พระไตรปิฎกฉบับมหาจุฬาลงกรณราชวิทยาลัย

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* The Tripitaka scriptures classified making merits into 3 domains known as 'Punnakiriya-vatthu' (บุญกิริยาวัตถุ) which means the bases of meritorious action. First, almsgiving (Danamaya) is the merit acquired by giving with generosity. Second, virtue (Silamaya) is the merit acquired by observing the precepts or to moral behavior and the third, meditation (Bhavanamaya) is

, 2539, น. 415). Among these, three principles respond directly to the pedagogy of Design Build program at INDA. Firstly, the Danamaya, which is the merit acquired by giving with generosity, can be demonstrated through the initiative of the curriculum as a way to use architectural education and practices to add social values and benefits. Second and third are, the Veyyavaccamaya, which is the merit acquired by rendering services, and the Dhammadesanamaya, which is the merit acquired by teaching the doctrine or showing truth.

These last two principles are directly embedded within INDA Design Build curriculum through civic engagement processes, designed for the students to offer communities with the act of making, building, exchanging and rendering services such as participatory workshops and co-creation of knowledge. From such perspectives, Design Build program is the 'act' of merit-making by giving back to the society where merits are imbued within the architectural education from its design, construction and the completion processes.

The curriculum has been designed along with regular semester courses in Design, History, Technology, when students undertake 2 summer semesters, at the end of second and third year. For their first summer semester, students undertake Design Build, where they work in a group of 10-20 students to manage a design project from start to finish. At this level, projects are typically small scale, and might include objects such as playground furniture, a lighting installation, or a cart for a street vendor. For their second summer, students take on a slightly larger project, in a course titled Design Construction for Community. As the name entails, this often involves working with a local community, either in Bangkok or in regional locations throughout Thailand.

These courses form a key part of the overall learning experience at INDA, which aims to provide a diverse education by using architecture to demonstrate the broader role of design in society. The curriculum was originally designed not only to meet the registration requirements of the Architects Council of Thailand but also to meet with Chulalongkorn University's Desired Characteristics of Graduates. As well as covering various types of skills and knowledge, the list of graduate qualities also includes 'Being Community Minded and Possessing Social Responsibility' and 'Sustaining Thainess in a Globalized World'. With around 95% of the population of Thailand following Buddhism, the idea of community service merges easily with Buddhist ideals of the benefits of positive actions. And it aligns with professional ideals such as those of Medicine and Law where giving back to the community is common through volunteer or pro-bono work.

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the merit acquired by practicing mental development. Seven other bases of merit-acquirement were introduced afterwards, completing the concept of 10 Punnakiriya-vatthu including Apacayanamya by humility or reverence, Veyyavaccamaya by rendering service, Pattidanamaya by sharing or giving out merit, Pattanumodanamaya by rejoicing in others' merit, Dhammassavanamaya by listening to the doctrine or right teaching, Dhammadesanamaya by teaching the doctrine or showing truth and lastly, Ditthujukamma by straightening one's views or forming correct views.

Figure 1. Data Observatory at NARIT. National Astronomy Research Institute of Thailand. Design Build 2019.

Instructor: Romea Muryn

Design Build Course

In the first summer course, students take part in all phases of a project from initial design to final fabrication, including sourcing materials, working out joints and connections, to final assembly and finishing. The objective is for students to work as a team, learning how to share and negotiate their own design ideas into one final version, and then to transform that design into a real artifact. By doing so they develop their judgement about what sort of ideas are feasible in light of material and production constraints.

Design Build projects are generally proposed by INDA instructors with a variety of design related topics including material science, fashion design, product design, art installations, interactive media, etc. but in some cases, they can also be a part of a collaborative effort between INDA partners and government agencies initiated jointly as a design challenge to prove how design can help resolve immediate needs of the society. In a period of no more than 6 weeks, students will learn how to develop projects to respond to real needs and requirements set by both the instructor and INDA partners and the end result must also be beneficial to real users. For example, the Data Observatory at NARIT in 2019 was one project that was initiated by INDA instructor Romea Muryn and the National Astronomy Research Institute of Thailand. The project called for a design solution to build a small outdoor observation unit adjacent to the main observatory building. Drawing on the rich history of observatories' social and political significance, students proposed an alternative to the outdated typology of the 20th century planetarium as they designed and built a temporary educational space that will host public lectures, symposiums and experiential astro-events.
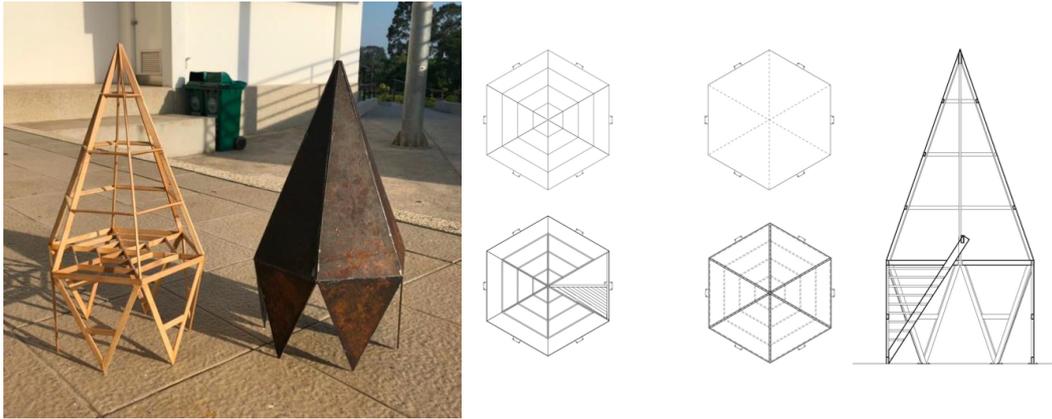
Figure 2. Scaled model and drawings for the prototype observatory developed by students and approved by NARIT.

Figure 3. Process of construction of the NARIT observatory conducted by students and steel contractors.

Another recent Design Build project was the IoT Garden, an interactive digital garden to represent environmental data captured from telecommunications service stations throughout Bangkok. Jointly developed with Thailand's largest telecommunications operator, AIS, the design challenge was to create an interactive experience for the general public to better understand the importance of IoT or Internet of Things data that impacts our environment. The merit of this project is to educate the public in preparation for transitioning the country towards a digital economy according to the Royal Thai government's national development plan (2017-2021). In addition to IoT, the digital government initiative also includes the promotion of AR/VR, GIS, Big Data, AI, Cloud Computing and Block Chain technology and new drivers for the digital economy in Thailand. AIS and INDA intended to demonstrate how common digital information can be interpreted and simplified for normal daily usage through an interactive installation in a public space where anyone can experience and understand the importance of live data streams.

Students therefore proposed an artificial garden full of digital flowers that can intuitively represent specific environmental data including temperature, humidity, PM 2.5 value, and traffic conditions that were most requested information in a public survey. Data collected by AIS was processed and transmitted to each flower through microcontrollers. Colors, movement, and sounds in the garden were then varied in response to changes in the environmental data, and visitors to the garden could also interact with the display using handheld fans. A total of 42 digital flowers to represent the 12 largest districts in Bangkok were created using laser cut and CNC components and activated by Arduino microcontrollers. The installation design proved popular with the public and students were able to see the benefits of IoT data collection towards improving environmental awareness in Thailand.

Figure 4. IOT Garden, Design Build 2019. Sponsored by AIS. Instructor: Surapong Lertsithichai.

The project was subsequently hand-picked by the Digital Economy Promotion Agency or DEPA to be showcased in their premiered annual event called Thailand Digital Big Bang 2019 held in October 2019 jointly with AIS at Impact Arena. The event was well received by over 300,000 visitors and the IoT Garden was publicized in many national and international media. The showcase was praised by the media as proof that IoT data can be useful to the public and easily interpreted while also being aesthetically pleasing to the eye.

Figure 5. IOT Garden showcased at Thailand Digital Big Bang event in 2019 at Impact Arena.

Design Construction for Community Course

Having learnt fundamental skills of project realization during their first summer, students then build on these skills by taking part in a larger architectural project in the Design Community Course. Here students are involved in all stages of the design and construction process, from client and community consultation, to concept and detail design and documentation, to project and budget management. Much of the construction is done by contractors but students are encouraged to assist with simple techniques such as mixing concrete or painting. Students are also responsible for project scheduling, including their own visits to site, arranging food and accommodation, as well as project documentation (photos and video) for publication.

Some of the projects are done in association with project sponsors, which not only enable students to engage with a local community, but to do so as part of a corporate social responsibility program. The first major sponsor for INDA projects was Mitsubishi Elevator Thailand, who each year select a location by inviting employees to nominate their hometown for donation. Projects are typically a multi-purpose open-air structure to be used as a school canteen. To date, there have been 8 projects made in association with Mitsubishi; in Sukothai, Prachinburi, Buen Kan, Chonnabot, Surin, Ubon Ratchatani, Uthai Thani, and Roi Et. Many of the projects have been published on Archdaily and the one in Surin received the Opinion Prize and Jury Mention from the International FAD Awards in Barcelona, Spain.

Another sponsor was Erawan group (2014 to 2017), with projects chosen through consultation with regional education departments, as part of an ongoing program of book donation tied to the Hop Inn hotel chain. Each year one school was chosen for donation of a small-scale building used as a library or study space, titled the Hop Learning Centre. Projects were built in Kanchanaburi, Nong Khai, Mae Sot, and Nakhon Si Thammarat. A number of other projects have been built without sponsorship and funded solely by INDA, including School canteens at Ranong at Tak.

The small-scale nature of these projects – around 100 square metres - enables them to be completed within a short timeframe to coincide with the semester. Approval processes are generally expedient through local government offices already linked to education departments. The tropical climate throughout Thailand means that simple construction techniques can be used, with only a roof providing shelter from sun and rain and open screen walls adding an extra layer of protection.
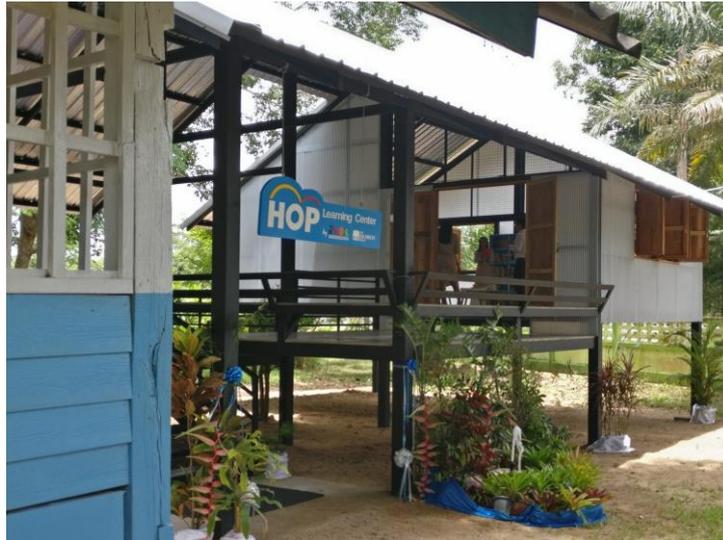
Figure 6. Hop Learning Centre. Design Construction for Community 2017. Sponsored by Erawan Group. Instructor: Scott Drake
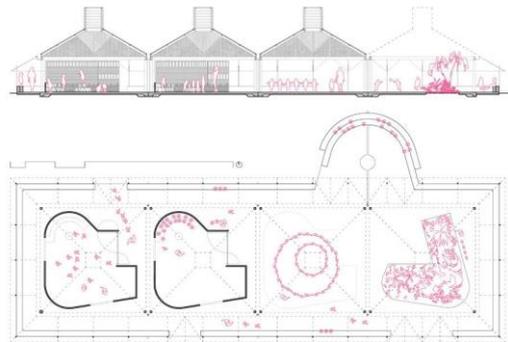

Figure 7, 8. Baan Nong Saeng Kindergarten, Design Construction for Community 2018, sponsored by Mitsubishi Elevator Thailand. Instructors: Pau Sarquella and Carmen Torres.

Figure 9, 10. Pylonesque. Design Construction for Community 2019. Sponsored by Mitsubishi Elevator Thailand. Instructors: Deborah Lopez and Hadin Chabel

Figure 11. School Canteen Ban Huay Mae Bon School, Tak. Design Construction for Community 2019.

Instructors: Will Hulbert and Wisarut Watannachote

Architecture Pedagogy

The Design Build Program has proven to be an essential part of the curriculum ever since INDA began in 2006. It gives students a unique opportunity to engage with real materials, real tools, real clients, and real communities. It provides a valuable experience outside of the regular classroom, as students collaborate in workshops or on site and learn to manage their own contribution within the team. They learn fabrication skills which connect their everyday computer modelling skills with an actual physical outcome. They learn about working with suppliers, contractors, and other participants to bring a project to reality. And more importantly, they help to strengthen the community of students as they work with each other to help real communities in Bangkok and regional Thailand. And finally, they show how architecture can play a part in the act of Making Merit and putting professional skills to use by helping others.

As with all courses at INDA, students are given the opportunity to comment on their own learning experience. For the Design Build courses, feedback is invariably positive, with students appreciating the chance to take part in all aspects of a design project from start to finish and to develop skills of management and collaboration that will help them prepare for a real career after they graduate. There is no replacement for University learning, but it is clear that the Design Build program provides an essential bridge for students between the isolation of academia and the realities of architectural practice.

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