ประสิทธิภาพของการเรียนรู้จากสิ่งแวดล้อมสรรค์สร้างผ่านประสบการณ์จริง: กรณีศึกษาจากชุมชนโดยรอบอุทยานประวัติศาสตร์ศรีสัชนาลัย

The Pedagogical Efficacy of Learning from the Built Environment through Real-life Experiences: A Case Study from Communities around Si Satchanalai Historical Park

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Abstract

In early 2017, a combined team of faculty members and students from King Mongkut's Institute of Technology, Ladkrabang (KMITL) and Ball State University (BSU), U.S.A., conducted a three-week field study in three neighborhoods around Si Satchanalai Historical Park, one of UNESCO World Heritage sites in Thailand. Drawing on the concepts of Coordination, Cooperation, and Collaboration (3Cs), the Thai and foreign students jointly created several spatial maps to record their encounters with the livelihood—along with artistic and architectural heritages, as well as social and cultural practices—in Nong O, Sarachit, and Dong Khu sub-districts in Sukhothai province.

The abovementioned activities supplied the contextual basis for this research to assess the pedagogical efficacy of learning from real-life experiences via the spatial mapping projects in those communities. Informed by Bloom's taxonomies of learning, the upcoming evaluative discussions contained a series of independent sample t-tests, utilizing a number of questionnaires and surveys for collecting data to construct a content model in terms of comparative studies between the KMITL and BSU members.

In effect, the statistical inquiries disclosed that not only did the participants advance their cross-cultural interactions and understanding with each other, but also gained a higher body of knowledge apart from developing many crucial skills, such as critical and creative thinking capabilities. The qualitative investigations further exhibited that the 2017 KMITL-BSU fieldwork contributed several scholarly improvements, resulting in academic achievements by the partakers from both universities.

บทคัดย่อ

ในช่วงต้นปี พ.ศ. 2560 ที่ผ่านมา คณาจารย์และนักศึกษาจากสถาบันเทคโนโลยีพระจอมเกล้าเจ้าคุณทหาร
ลาดกระบัง และ Ball State University ประเทศสหรัฐอเมริกา ได้ร่วมกันศึกษาพื้นที่ในชุมชนสามแห่งบริเวณโดยรอบ
อุทยานประวัติศาสตร์ศรีสัชนาลัย ซึ่งเป็นหนึ่งในมรดกโลกของประเทศไทยที่ได้รับการรับรองจากองค์การการศึกษา
วิทยาศาสตร์และวัฒนธรรมแห่งสหประชาชาติ (UNESCO) โดยอาศัยแนวคิดเรื่องการประสานงานการสร้างความร่วมมือ
และการทำงานร่วมกัน ตลอดช่วงระยะเวลา 3 สัปดาห์ นักศึกษาชาวไทยและต่างชาติได้ดำเนินการเก็บข้อมูลภาคสนาม
และจัดทำแผนผังเชิงพื้นที่ในหลายหลายรูปแบบขึ้น เพื่อใช้สำหรับบันทึกประสบการณ์จริงของตนในการศึกษาค้นคว้าเกี่ยวกับ
มรดกทางศิลปกรรมและสถาปัตยกรรม ตลอดจนบริบททางทางสังคมและวัฒนธรรม รวมทั้งวิถีชีวิตของผู้คนใน ตำบลหนองอ้อ
ตำบลสารจิต และตำบลดงคู่ ซึ่งตั้งอยู่ใน อำเภอศรีสัชนาลัย จังหวัดสุโขทัย

กิจกรรมทางวิชาการในข้างต้นได้ก่อให้เกิดบทความวิจัยชิ้นนี้ขึ้น ซึ่งมีพื้นฐานมาจากทฤษฎีการประเมินผลสัมฤทธิ์
ทางการเรียนรู้ของ Benjamin Bloom เพื่อประเมินประสิทธิภาพของกระบวนการเรียนรู้จากสภาพแวดล้อมสรรค์สร้าง
ในชุมชนเหล่านั้นผ่านประสบการณ์ชีวิตจริง โดยที่การประเมินดังกล่าวประกอบไปด้วย การทดลองกับกลุ่มตัวอย่าง
โดยใช้แบบสอบถาม ร่วมกับการศึกษาในเชิงเปรียบเทียบด้านผลสัมฤทธิ์ทางการเรียน ระหว่างนักศึกษาไทยและนักศึกษา
ต่างชาติที่เข้าร่วมเก็บข้อมูลภาคสนามและและจัดทำแผนผังเชิงพื้นที่ใน อำเภอศรีสัชนาลัย

อนึ่ง สาระของการประเมินผลสัมฤทธิ์ของการเรียนรู้ในงานวิจัยยังได้เผยให้เห็นว่า นักศึกษามิได้เพียงแต่พัฒนา
ทักษะทางความคิดในเชิงสร้างสรรค์และวิพากษ์จากการเรียนรู้ผ่านประสบการณ์จริงของตนเท่านั้น ทว่า กระบวนการ
จัดทำแผนที่ยังได้ช่วยพัฒนาและเสริมสร้างปฏิสัมพันธ์ตลอดจนการตระหนักรู้และการเรียนรู้ข้ามวัฒนธรรม อันนำมาซึ่ง
การพัฒนาผลสัมฤทธิ์ทางการเรียนของนักศึกษาอีกประการหนึ่งด้วย

1. Introduction

This research presented an evaluative investigation on the pedagogical efficacy of learning through real-life experiences from the built environment in three neighborhoods of Si Satchanalai district. The inquiry originated from a three-week fieldwork in Nong O, Sarachit, and Dong Khu sub-districts, situated around Si Satchanalai Historical Park in Sukhothai province, which was one of UNESCO World Heritage sites in Thailand. The said collaborative efforts were undertaken by four faculty members and twenty students from the Department of Architectural Education and Design, Faculty of Industrial Education and Technology, King Mongkut's Institute of Technology, Ladkrabang (KMITL), plus one professor and nine students from the College of Architecture and Planning, Ball State University, U.S.A. (BSU) in January 2017.

Under a framework of Coordination, Cooperation, and Collaboration (3Cs), the twenty-nine partakers from both universities were organized into three teams—each of which was assigned to a particular sub-district—to examine the daily lives of their host families (See: Rockwood 1995a; 1995b for theoretical elaborations). Consisting of nine or ten combined KMITL-BSU members, each group was subdivided into three small units. These so-called "twelve squads" stayed together for the entire duration of the field study, and jointly produced several spatial maps to record their encounters not only with the livelihood of the hosts, but also the artistic and architectural heritages, as well as social and cultural practices in the communities.

Informed by the Cognitive domain in Bloom's taxonomies, the upcoming discussions incorporated a series of independent sample t-tests (Total Average Compare Mean) to evaluate the pedagogical efficacy of learning from the built environment through the real-life experiences of the participating students via the spatial mapping projects in Nong O, Sarachit, and Dong Khu. By using a number of questionnaires and surveys for data collections—operating on the six indicators of: Student Expectations, Group Interactions, Development of a Scholarly Community, Communication Styles, Language and Cultural Barriers, as well as Learning Achievements[1] —the t-tests results were put together to generate a content model embodying comparative studies between the KMITL and BSU members in several key areas. The aforementioned criteria included developments of critical and creative thinking capabilities in conjunction with advancement of a better understanding on cross-cultural learning.

In a nutshell, the statistical studies demonstrated that not only did the participants advance their cross-cultural interactions and understanding with each other, but also gain a higher body of knowledge aside from developing required essential skills, such as critical and creative thinking capabilities. In addition, those qualitative investigations revealed that the 2017 KMITL-BSU fieldwork indeed contributed several scholarly improvements and academic achievements to the partakers from both universities.

2. The 2017 Fieldwork: Contextual Background, Theoretical Basis, and Methodological Approach

Realizing the importance of international collaborations in the disciplines of architecture and planning, the Department of Architectural Education and Design at KMITL had continued its biannual joint workshops and study trips with foreign partners, as evident from the joint fieldwork in Si Satchanalai with BSU in 2017 as the latest example. Encompassing Nong O, Sarachit, and Dong Khu sub-districts, these areas stood next to Si Satchanalai Historical Park, a UNESCO World Heritage site (Figure 1).[2]

As stated earlier, the KMITL-BSU learning process basically stemmed from the creations of spatial maps recoding their experiences with the three communities.[3] The mapping projects began with identifying what to be mapped before developing the conceptions of space to guide the proceeding

investigations. Next, the KMITL and BSU partakers collected necessary information from two main sources. Initially, existing information was assembled from available printed document, online materials, and personal observations. Afterward, the students resorted to their real-life experiences during the three-week fieldwork for data accumulations—primarily via their daily conversations and interactions with members of the communities—supplemented by other activities organized on a weekly basis, such as group meetings with local leaders, interviews with personnel from non-government organizations (NGOs), and discussions with officials from different state agencies.
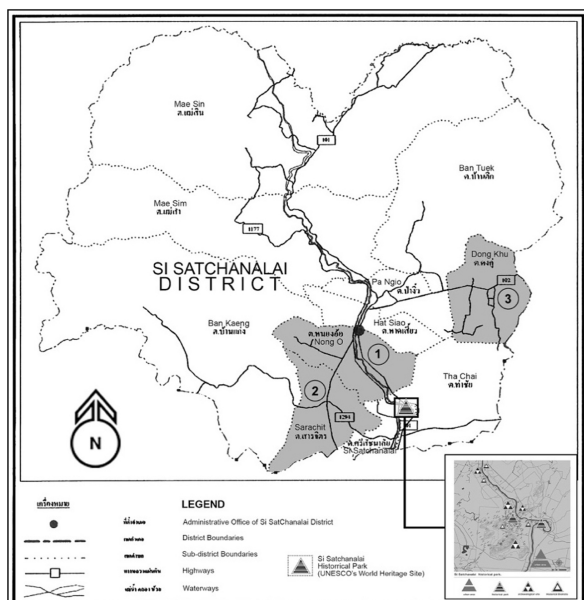
Source: Courtesy of the Heritage Academic Research Center (HARC) at KMITL by Surasak Kangkhao, 2017.

Figure 1. Locations of Si Satchanalai Historical Park and Nong O, Sarachit, and Dong Khu Sub-districts in Si Satchanalai

In essence, the notion of learning through real-life experiences incorporated a methodological premise of ethnographic and cross-cultural studies.[4] By embedding small twelve teams of Thai and American students together with the host families, the entire collaborations were organized to reciprocally benefit the participants from both universities through the knowledge and insights of their local

hosts. In this respect, it could be maintained that cross-cultural studies played an important role for the conceptualization and implementation of the 2017 joint fieldwork in Si Satchanalai. Notwithstanding their Western-oriented educations, both the KMITL and BSU students were encour¬aged to examine the built environment in Nong O, Sarachit, and Dong Khu sub-districts—as it was socially perceived, culturally conceived, physically used, and psychologically experienced, from which meanings were generated through spatial practices, perceptions, and interpretations.[5]

In comprehending how the built environment could affect human experiences, psyches, and perceptions, the instructors asked the KMITL-BSU teams to place their scholarly emphases on observing, noticing, recoding, analyzing, and learning the relationships among people, places, and built forms (Suri, 2011). For that reason, a remark could be made that the KMITL-BSU collaborations in Si Satchanalai appropriated two ethnographic points of views called the etic (outsider) and emic (insider) (See: Askland, Awad, Chambers & Chapman, 2014, pp. 285-287). Whereas the BSU partakers played the etic role, their host families assumed the emic one. The KMITL participants, however, undertook both roles during their ethnographic investigations in the three communities. They performed an emic role by working in their home country, and an etic by training outside their everyday learning environment in the capital city (See: Pavlides & Cranz, 2012, pp. 1-2).

Furthermore, in order to facilitate teamwork among the KMITL and BSU partakers as well as to foster interactions with the local people, the field study incorporated the concepts of Coordination, Cooperation, and Collaboration (3Cs)—drawn from inquiries into the processes of group participation from a wide range of studies in social sciences (For instance, see: Kagan, 1994; Kagan & Kagan, 1998; Kagan, 2009)—as its educational modus di operandi. The 3Cs pedagogical framework was applied to the

spatial mapping projects in Nong O, Sarachit, and Dong Khu communities in accordance with Rockwood's notions of cooperative, collaborative, and coordinative learning (1995a; 1995b) as explained below.

Cooperation denoted a methodology of choice for acquiring foundational knowledge via a well-structured lesson, such as a group assignment to explore a variety of topographic maps and aerial photography portraying geological features in Nong O, Sarachit, and Dong Khu sub-districts.

Collaboration referred to a methodological approach for developing knowledge that dwelled less on factual content but more on analytical, interpretative, and critical aspects. Illustrations of Collaboration were exemplified by the creations of spatial maps by the KMITL and BSU participants, such as a figure-ground map of Nong O (Figure 2), a map displaying several locations in Sarachit described by Phra Ruang's stories (Figure 5), and a map exhibiting various tourist attractions in Dong Khu (Figure 8).

Coordination signified a well-defined normative methodology, exercised to regulate a systematic knowledge that was socially constructed. Operating in concert with Collaboration and Cooperation, an example of Coordination encompassed peer-assisted educational activities, such as organizing a workshops or discussion groups to determine a suitable digital platform for the spatial mapping projects in Si Satchanalai.
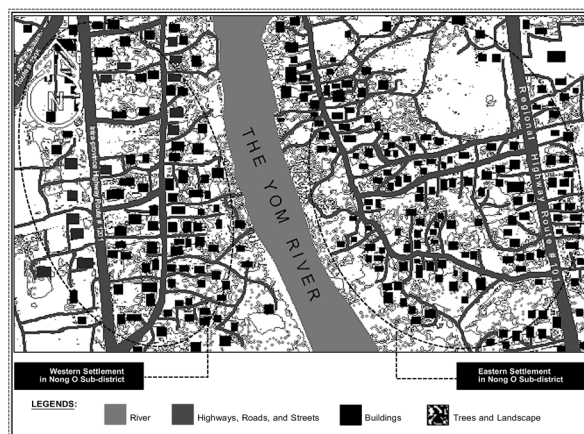
Source: The KMITL-BSU Team of Students in Nong O, with Notations from the Authors.

Figure 2. A figure-ground map of Nong O community

3. The Joint KMITL-BSU Spatial Mapping Projects in Si Satchanalai

3.1 Nong O Community

Located north of Si Satchanalai Historical Park, Nong O sub-district consisted of residential and commercial structures in combination with public facilities to serve both visitors to the nearby UNESCO's World Heritage Site and the local populace. Occupying a vast basin area, restaurants, shops, and warehouses sat casually between farmlands. Many residents offered visitors a homestay service, an ethnographic form of hospitality whereby the KMITL and BSU students lived with their host families.

At first, the KMITL-BSU team decided to examine the overall pattern of urban settlements by digitally transforming an aerial photo of the sub-district to a figure-ground diagram. The map was a two-dimensional diagram portraying relationships among primary urban landscape components—i.e., plots, streets, constructed space, and open space—in terms of mass-to-void interactions (Figure 2).

As shown by Figure 2, although the entire Nong O sub-district stood on both banks of the Yom River, the urban settlements took place along the major roads running in parallel to the river. As a matter of fact, the orientations of buildings did not face toward the Yom either, but instead to main arteries and their tributary streets. On that account, the KMITL-BSU teams noticed that the roads and streets in villages at Nong O community functioned in double capacities, both as pathways for vehicular and pedestrian traffics, and as civic space where social interactions among the inhabitants took place.

Subsequently, the students selected two commercial structures as their objects of investigations for the spatial mapping projects in Nong O. The first was Prasert Antiques, a sangkhalok factory and shop, whereas the second was Baan Silpa Silalang Art Gallery and Homestay. As depicted by the spatial

maps portraying the floor plan sketches of Prasert Antiques (Figure 3) and Baan Silpa Silalang (Figure 4), the KMITL-BSU collectively noted that the two buildings share some common traits in spatial configurations through their transformative capacity, which empowered the owners to address both their needs and those of other users at the same time. Notwithstanding their utilitarian dissimilarities, both structures indeed possessed duality and flexibility in their interior spatial arrangements (Figure 3 and 4).
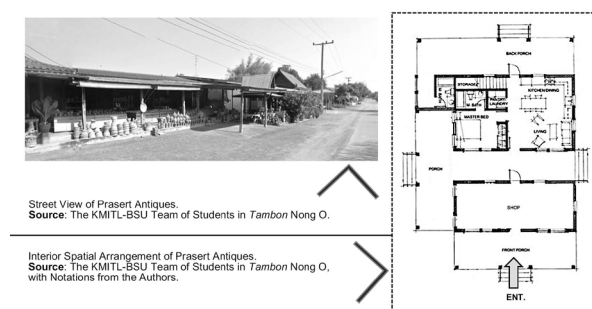
Source: The KMITL-BSU team of students in Nong O, with notations from the authors.

Figure 3. The spatial mapping project at Prasert antiques in Nong O sub-district
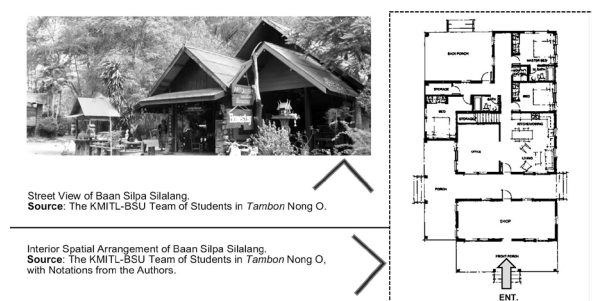

Source: The KMITL-BSU team of students in Nong O, with notations from the authors.

Figure 4. The spatial mapping project at Baan Silpa Silalang in Nong O sub-district

3.2 Sarachit Community

Standing west of Si Satchanalai Historical Park, Sarachit was perhaps the most vivid example among the three communities, where indigenous legends and beliefs played a central role in formulating a definitive shape and force in the psychological dimension to construct a common identity among the populace. The KMITL and BSU students founded that the local

culture in the sub-district was dominated by a native folklore of Phra Ruang, based on the 14th-century manuscript known as "Traiphum Phra Ruang" (The Three Realms of Cosmological Existence According to King Ruang) (See: King Lithai, 1985). Phra Ruang was a mythic leader whose stories of supernatural powers and unrequited love lent names to many places and features in the community (Figure 5). Actually, the term "Sarachit" itself alluded to the sorrow felt by Phra Ruang after his failure to gain the affection of the woman he desired (Amphoe Si Satchanalai, 2010).
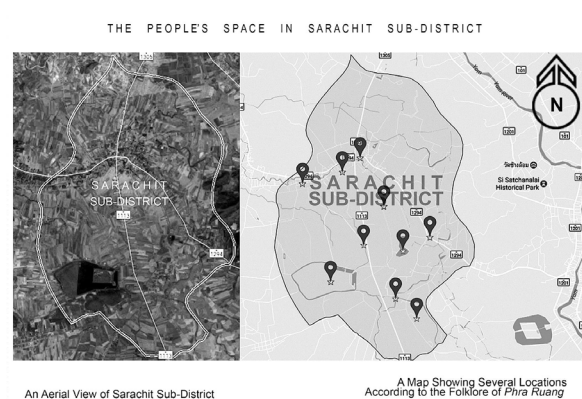
Source: Google Earth, 2017, and the KMITL-BSU Students in Sarachit, with Notations from the Authors.

Figure 5. A spatial map showing the locations of places in Sarachit mentioned by Phra Ruang's stories

With the legends of Phra Ruang embedded in their psyches, the denizens of Sarachit had appropriated his tales to their spatial practices and social activities. Correspondingly, the students remarked that, at the macro level, space here existed dualistically, both in the collective memories of the inhabitants and in the physical reality by means of representative associations with this folk figure. This observation was corroborated by the fact that several geological features and places in the sub-districts were described by Phra Ruang's stories. Examples of these locations included: Kaeng Luang, a stream where Phra Ruang met his beautiful consort, Nang Kham, for the first time; Baan Nong Kam, an area believed to the site where Phra Ruang exercised

his magical power to erect a bridge across the abovementioned Kaeng Luang; Baan Cook Pattana, a place where Phra Ruang succumbed to his grief because Nang Kham left him, so he kneeled down to cry;[6] and Baan Nong Chumtad, a locale where Nang Kham washed her body after an intimate encounter with Phra Ruang (Figure 5) (See: DASTA, 2014).

At the micro level, the aforementioned discovery was substantiated by a series of spatial analyses, where the KMITL-BSU teams probed into the ways in which the tales of Phra Ruang were represented by the productions of cultural heritages. On that basis, a particular case study deserved to be mentioned in this research: the cultural learning center Baan Cook Pattana village located at the heart of Sarachit.

During a field trip, the KMITL-BSU members met with the village headwoman, who introduced them to the cultural learning center where kites modeled after those purportedly flown by Phra Ruang were made (Figure 6). Visitors were taught to create them as well. Since these kites were valued as cultural artifacts—being an integral part of the oral history—the community organized an annual kite festival where contests were held to see who could keep their kite in the air for the longest amount of time.

Phra Ruang
K i t e

Cultural Learning Center @
B a a n   C o o k   P a t t a n a

Source: The authors.

Figure 6. An Exampleof Phra Ruang Kite and the Cultural Learning Center at Baan Cook Pattana Village in Sarachit Sub-district

In brief, the students reflected that the cultural learning center arguably epitomized a spatial manifestation of Phra Ruang's tales in socio-cultural dimension. The center originated from a group of civic-minded citizens working together through local organizations—namely the wives association and sub-district council—and taking initiatives to fund the construction of this facility without any financial assistance from the government. Such a cooperation demonstrated that the indigenous legends of Phra Ruang were valued by the people of Sarachit as a shared cultural heritage, whose narratives cultivated feelings of solidarity and belonging among the local residents, leading to their willingness to engage each other in social practices.

3.3 Dong Khu Community

Situated east of Si Satchanalai Historical Park, Dong Khu appeared to be the largest and most rural area when comparing to Nong O and Sarachit. In examining such a vast countryside, the KMITL and BSU members operated on a basis that space existed through dialectical outcomes among the inhabitants, their livelihood, and physical reality. As a consequence, it could be argued that space was a social construct, being made and lived before it was interpreted and conceptualized (Lefebvre, 1991, pp. 34-36, p. 143).

With this conceptual framework in mind, the teams began to explore the sub-district based on their scholarly interests on tourism and sustainable development. After conducting several field trips and interviews, they discovered that although both issues were greeted with mixed receptions, the results veered toward positive responses from the majority of Dong Khu residents, with whom the students encountered during their three week-long fieldwork in the sub-district.

To cite an example, during a visit to a morning glory farm, the KMITL-BSU team met a group of farmers who cultivated this type of water spinach, also known in Thai as phakboung. The students took

note that the decision made by the farmers to pool their money and other resources into a sort of cooperative, which helped them share facilities, reduce costs, and give the Dong Khu area some recognition as a producer of quality water spinach, which was very popular vegetable in the country (Figure 7).
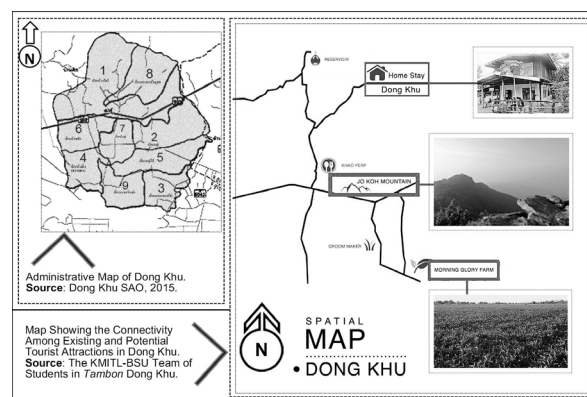

Source: The authors.

Figure 7. The Morning Glory Farm and Homestay Facilities in Dong Khu, with the Jo Koh Mountain Standing in the Background

Apart from producing phakboung leaves and seeds, some of the farmers took initiative by erecting infrastructure intended for anticipated new visitors, which included bamboo rafts, homestay facilities, and a sort of elevated boardwalk around the ponds where water spinach grew (Figure 7). Obviously, tourism came into the picture as exhibited by the aforementioned cooperative efforts among the farmers to promote visits to the area by Thailand's city dwellers.

Moreover, toward the conclusion of their fieldwork in Dong Khu, the KMITL-BSU teams held a group meeting with the Sub-district Administrative Organization (SAO). Soon after, the staff members escorted them to the Jo Koh Mountain, whose natural topography and scenery were tailored for highly enjoyable outing activities. The SAO had envisioned this area to be an eco-tourist attraction for hiking, in which a 450 m. trip to the zenith would be rewarded by breath-taking panoramic views of Si Satchanalai. According to the plan, a souvenir shop running by local people would be erected next to a parking lot to support income-generating activities. Seemingly, Dong Khu SAO saw itself as an agent of changes, seeking to improve the livelihoods of its constituents

through development projects that would facilitate tourism in the community.

Taken together, the KMITL-BSU teams incorporated both case studies along with others into their overall spatial map of the sub-district to create a map of tourist attractions, as illustrated by Figure 8.


Source: The KMITL-BSU Team of Students in Dong Khu, with Notations from the Authors.

Figure 8. The Spatial Mapping Project in Dong Khu

4. The Evaluations and Implications of the Pedagogical Efficacy of Learning from the Built Environment through Real-life Experiences

When measuring the pedagogical efficacy of the 2017 KMITL-BSU fieldwork in Si Satchanalai, it became apparent that the concept of learning achievement was quintessential. Djamarah (1994, p. 19), defined that learning achievements were the outcomes of educational activities that had been done, which could be measured individually and collectively. Correspondingly, at the end of the fieldwork, the KMITL and BSU partakers were asked to assess their scholarly improvements via a self-evaluated questionnaire, containing a total of twenty enquiries. Subsequently, a series of mean calculations were conducted on the returned questionnaires to determine the depth of knowledge, skill levels, collaborative abilities, language proficiencies, and degrees of satisfaction achieved by the participants from both universities.

As depicted by Figure 9, the six levels of the Cognitive domain in Bloom's learning taxonomies[7] served as key index performance (KPI) to appraise the learning achievements of the students.[8] These KPIs—ranging from the lowest to highest orders in the Cognitive domain—encompassed the levels of: (1) Knowledge, (2) Comprehension, (3) Application, (4) Analysis, (5) Synthesis, and (6) Evaluation (Figure 9).
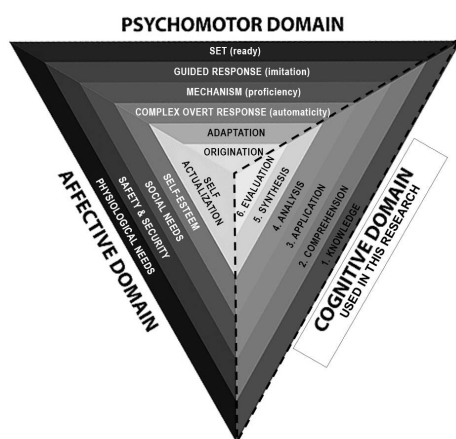
Source: Courtesy of EpicSki academy by Bob Barnes, 2017.
Figure 9. Bloom's learning taxonomies

With regard to what constituted the definitions of "learning achievements" in this research, the term "knowledge" alluded to an understanding of Nong O, Sarachit, and Dong Khu communities through real-life experiences, while "Skills" signified a team working process, in conjunction with communication and problem solving abilities. "Skills" also described abilities to learn the social, cultural, and spatial practices, together with design and planning approaches from the denizens of Si Satchanalai via the spatial mapping projects. In addition, the term characterized the abilities to advanced critical and creative thinking capabilities, as well as to make progress on formulating a dialectical awareness among human beings, their livelihood, and the built environment by engaging in cross-cultural interactions.[9]

Considering the size and sampling of the KMITL-BSU population, the total number of students involved in the statistical investigations was eighteen, nine of which came from KMITL and nine from BSU (KMITL n=9, BSU n=9).[10] As explained before, within this population group, a series of independent sample t-tests were conducted to create a content model, featuring a series of comparative studies between the KMITL and BSU members.[11] The content model was then substantiated by preference achievement tests, which in turn verified the validity and reliability of the coefficient alpha of the questionnaire and survey results in terms of Cronbach 's Alpha.[12] With a coefficient reliability of 0.80, the evaluation on the pedagogical efficacy of learning from the built environment through real-life experiences was illustrated via the following inquiries.[13]

4.1 Students' Expectations

Prior to the commencement of the KMITL-BSU fieldwork, personal conversations disclosed that several Thai and foreign students expressed their apprehension on socializing and working with new acquaintances both in the intra and inter-cultural situations. Although the participants were told about the complexity of their tasks prior to the beginning of the field study, the instructors also reminded them that they should demonstrate a tangible growth in their ability to acknowledge cultural differences and to conceptually relate one's own culture to another at the end of the KMITL-BSU collaborations.

Voluntarily joining the 2017 fieldwork, results from personal interviews exhibited that the KMITL and BSU partakers hoped to learn about the cultural heritages of Si Satchanalai, experience cross-cultural interactions, explore unfamiliar computer programs, make new contacts, improve foreign-language proficiency, as well as advance their creative and critical thinking skills, along with interpersonal and collaborative abilities. Expressions of these aspirations frequently echoed throughout the ethnographic studies in Nong O, Sarachit, and Dong Khu sub-districts.

4.2 Group Interactions

The combined KMITL-BSU instructors regularly visited the students in each sub-district, and discovered that some students took initiatives to arrange face-to-face meetings with local inhabitants. Those motivated individuals not only took on leadership roles, but also assumed more responsibilities for the mapping projects, resulting in cordial working relationships with their colleagues and local hosts that facilitated a development of camaraderie among the teammates and friendship with members of the host families.

As evident from Table 1, the Americans obtained statistical higher means in their satisfaction with the overall group performance, $t = 2.25$, $p = 0.031$, a large effect size ($d = 0.8$); the level of easiness in making group decisions, $t = 2.32$, $p = 0.027$, $d = 0.8$, a large effect size; how well they knew about their responsibilities with the groups, $t = 3.55$, $p = 0.001$, $d = 1.22$, a large effect size; and how well they had contributed to the project, $t = 4.70$, $p = 0.000$, $d = 1.73$, a large effect size. Interestingly, however, the average means in the last category indicated a stark contrast between the KMITL and BSU participants. While several variables conditioned the interpretations of these statistics, the fact that all the KMITL members studied in the undergraduate level whereas four of the BSU partakers were graduate students should not be overlooked.

With an exception of the abovementioned peculiarity, the findings generally indicated that there were no significant statistical differences in how the BSU students felt that everyone had contributed equally; how well they knew about their group members' responsibilities; and how satisfied they were with the outcome of the spatial mapping projects in the three communities in Si Satchanalai.

4.3 Development of a Scholarly Community

Recent scholarly works had illustrated that with a significant growth in academic publications demonstrating a shift away from the Euro-centric precepts since the late-1990s (Bozdogan, 1999, pp. 211-214), cross-cultural studies had become one of the main scholarly foci in contemporary architectural discourse, including in Southeast Asia (Pieris, 2014, pp. 2-6). As shown by the KMITL-BSU collaborations in Si Satchanalai, not only had many foreign universities increasingly incorporated Thailand into their course syllabi for overseas studies, but also expanded collaborative efforts with Thai academia through international workshops and exchange programs (For instance, see: Noobanjong & Louhapensang, 2015, pp. 105-106; O' Brien & Natakun, 2016, pp. 77-79).

Table 1. Difference in Group Interactions between the KMITL and BSU Students (KMITL n=9, BSU n=9)

Questions/Criteria	KMITL Students		BSU Students		t	p
	Mean	Standard Deviation	Mean	Standard Deviation		
Satisfied with group performance	3.50	1.09	4.25	0.85	2.25*	0.031
Easy to make group decisions	2.54	1.01	3.40	0.88	2.32*	0.027
Knew my responsibilities	3.86	0.66	4.58	0.51	3.55*	0.001
Put best efforts into the KMITL-BSU fieldwork	2.79	1.31	4.55	0.61	4.70*	0.000

Sources: The authors.

*Remarks: Since Levene's F was statistically significant ($p < .05$), the "equal variances not assumed" t was used.

Table 2. Difference in the Development of a Scholarly Community between the KMITL and BSU Students (KMITL n=9, BSU n=9)

Questions/Criteria	KMITL Students		BSU Students		t	p
	Mean	Standard Deviation	Mean	Standard Deviation		
Knew group members on a deeper level	4.00	0.56	4.53	0.70	2.41*	0.022
Felt supported by team members	3.29	0.73	4.42	0.69	4.56*	0.000
Developed closer relationships with groupmates	3.36	1.08	4.63	0.60	4.33*	0.000

Sources: The authors.

*<u>Remarks</u>: Since Levene's F was statistically significant (p < .05), the "equal variances not assumed" t was used.

The said remark lent a premise to argue that a development of a scholarly community was another crucial indicator to appraise the pedagogical values of learning from the built environment through real-life experiences. Via the executions of t-tests, there were very significant statistical differences in key indicators for the development of a scholarly community. Table 2 displayed that the American students possessed higher average means of knowing group members on a deeper level, t = 2.41, p = 0.022, d = 0.8, a large effect size; feeling supported by group members, t = 4.56, p = 0.00, d = 1.6, a very large effect size; and developing closer relationships with groupmates, t = 4.33, p = 0.000, d= 1.5, a very large effect size.

In effect, those results suggested that one of the reasons why the BSU partakers spent more efforts on developing a scholarly community than the KMITL counterparts might stem from the fact that nearly a half of them was graduate students. Owing to this observation, the whole group was thus driven toward academic-oriented experiences in which building educational networks with their teammates, fellow researchers in the three sub-districts, and the instructors was crucial for engaging in learning activities during the field study.

The above interpretation was strengthened by another fact that all of the motivated individuals who took initiatives and assumed leadership in the spatial mapping projects were composed entirely of the four graduate students from BSU. In any case, such a statement implied in consequence that both the KMITL participants—along with the five BSU undergraduate members—appeared to confine themselves mostly to the role of passive learners rather than active ones.

4.4 Communication Styles

Communication was a key factor for cross-cultural ethnographic studies (For instance, see: Halse, 2008; O'Reilly, 2009). A similar observation could be applied to learning from the built environment through real-life experiences as well. During the 2017 fieldwork, the participants were asked about how well they understood the instructions for completing their assignments. The Thai students replied that they were more hesitant in seeking help, but depended on their teammates more than the instructors in solving problems. Some KMITL partakers also admitted that they did not pay enough attention to the project, and therefore were reluctant to ask for help, for fear that they might become a burden to others. Nevertheless, the Thais were appreciative of receiving help from their American colleagues.

While the BSU students were more comfortable in asking questions and seeking help, many of them preferred telephone or face-to-face conversations instead of online communication chiefly because the internet signals in the three sub-districts were unreliable. Be that as it may, some American participants avoided asking questions since they did not want to be judged negatively, epitomized by two particular concerns, which were: "is it the language barrier or just the fact that we are shy and think we could do it on our own?" and "sometimes it is laziness, but other times it is just my own pride that keeps me from asking for help."

Table 3. Difference in Communication Styles between the KMITL and BSU Students (KMITL n=9, BSU n=9)

Questions/Criteria	KMITL Students		BSU Students		t	p
	Mean	Standard Deviation	Mean	Standard Deviation		
Ease of initiating conversations	3.50	0.76	4.20	0.70	2.78*	0.009
Ease of self-expressions	3.29	0.91	3.90	0.72	2.19*	0.036

*<u>Remarks</u>: Since Levene's F was statistically significant (p < .05), the "equal variances not assumed" t was used.

In sum, Table 3 displayed two t-tests indicating major differences in how the KMITL and BSU initiated a conversation, t = 2.78, p = 0.009, d = 1, a large effect size; and how they expressed themselves, t = 2.19, p = 0.036, d = 0.8, a large effect size. The results implied that it was easier for the BSU than KMITL students to talk with others and express themselves.

4.5 Language and Cultural Barriers

In order to measure an educational effectiveness of learning from the built environment through their real-life experiences, the KMITL participants were interviewed to pinpoint the problems inhibiting their collaborative endeavors with BSU peers, soon after the conclusion of the fieldwork.[14] During the debriefing sessions, almost all the Thai students maintained that the low level of their English proficiency was the main factor that preventing them to communicate effectively with their American peers, leading to difficulty in executing the spatial mapping projects as much as in bridging cross-cultural understanding.

Regardless of such obstacles, the interviews revealed that several Thai partakers reacted positively for receiving opportunities to learn new English vocabularies in conjunction with some American cultural practices, beliefs, and social values from interacting with their foreign teammates. Some of the Thai students reflected that they were impressed with the proactive attitude, self-confidence, and candid expressions of opinions of their American counterparts, witnessed during the spatial mapping projects.

In combination with the preceding statistical analyses, the KMITL-BSU instructors observed that many of the Thai students mistakenly identified the joint fieldwork as simply another chance to improve their communication skills in English language. To make the matter worse, their intimidation, shyness, and lack of motivation rendered negative effects on cross-cultural exchanges and ethnographic activities. In fact, morale and motivation seemed to be troublesome for the American students as well. For instance, instead of being keen to learn some basic Thai vocabularies, a couple of BSU partakers communicated mainly in English with their KMITL colleagues and host families throughout the three-week period in Si Satchanalai. These individuals, too, had to be reminded repeatedly to work together with their Thai peers as a team.[15]

The instructors also noted that the KMITL participants preferred to build relationships with foreign partners before taking on collaborative tasks. On the contrary, the BSU partakers dwelled less on personal assurance, but concentrated on completing their assignments by making more inquiries on the details of the collaborations. While the Thais were barely prepared when the fieldwork started, their American colleagues were anxious to finish the mapping projects, leading to confusion and frustration on both parties (Table 1).

Moreover, as evident from their higher level of ease to initiate a conversation (Table 3), the BSU students seemed to be more expressive. Some BSU participants were more conscious about their responsibilities with the groups and content with their

own contributions. At the same time, these motivated individuals were willing to reach out to help their Thai peers. In contrast, burdened by shyness and language barrier, the KMITL partakers were more hesitant in seeking help from both their American colleagues and foreign instructor, as indicated by the quantitative outcomes in Table 3.

Finally, with respect to the development of a scholarly community (Table 2), the statistics suggested that the 2017 joint KMITL-BSU fieldwork seemed to benefit the American members markedly through their real-life leaning experiences rom the built environment in Si Satchanalai. Although the said cross-cultural encounters helped them develop closer relationships with their Thai teammates, a process of relationship building must be continued and strengthened, if the KMITL-BSU collaborations were to be sustained.

4.6 Learning Achievements

Table 4 examined the learning achievements of the KMITL and BSU students via a series of the t-tests demonstrating, t = 2.68, p = 0.023, d = 0.8, a large effect size. In general, the results disclosed that there was no discernable difference in attaining educational accomplishments between the Thai and foreign participants, despite their cultural and other dissimilarities.

Aside from assessing the Cognitive realm of the population group from the lowest to highest orders, (from Knowledge to Evaluation) (Figure 9), the statistical outcomes in Table 4 indicated that the KMITL and BSU partakers alike had gained a higher degree of improvements in all aspects. Their most noticeable progresses took place at the fundamental level—Knowledge—followed by Comprehension, Analysis, and Evaluation. Likewise, decent development happened in the categories of Synthesis and Application as well.

Overall, the t-test scores from Table 4 collectively justified and reaffirmed that the 2017 KMITL-BSU fieldwork possessed remarkable pedagogical efficacy, enabling the students to advance their intercultural understanding through knowledge obtained from their real-life experiences in Nong O, Sarachit, and Dong Khu sub-districts (Table 4; Item: 2, 3, 6 and 9). In addition, by engaging in cross-cultural interactions, both the KMITL and BSU participants were able to develop their critical and creative thinking skills, (Table 4, Item: 12-15) facilitated by the ethnographic and cross-cultural learning (Table 4; Item: 4, 5 and 16) from the spatial mapping projects in Si Satchanalai (Table 4; Item: 1, 7, 8, 10 and 20). In a nutshell, it might be argued that the 2017 fieldwork lent opportunities for the participating students to sharpen a number of important educational skills and abilities, which could be beneficial to their academic and professional developments (Table 4; Item: 17, 18 and 19).

5. Conclusion

The preceding discussions in this research collectively validated the educational values of the 3Cs concept embedded in the spatial mapping projects in Nong O, Sarachit, and Dong Khu sub-districts (Table 1-4). Aside from providing a methodological justification for applying the pedagogical model of learning through real-life experiences to the fieldwork in Si Satchanalai, the studies also elaborated that the KMITL-BSU collaborations offered an effective project-based learning (PBL) lesson to understand the mechanisms and networks by which knowledge, ideas, skills, instruments, and practices were distributed across cultures (Figure 2-8). In this respect, it could be maintained that the process of spatial mapping therefore became a discourse for cross-cultural exchanges, virtually existing at a cultural hazy locus where the margins of one culture overlapped the other from which human interactions occurred (Ben-Zaken, 2010, pp. 163-167).

Table 4. Self-evaluation Scores from the KMITL and BSU Students (KMITL n=9, BSU n=9)

	Items	9 KMITL Students		9 BSU Students	
		Before (Mean)	After (Mean)	Before (Mean)	After (Mean)
1.	An understanding on the livelihood, along with artistic and architecture heritages, as well as social and cultural practices, in Nong O, Sarachit, and Dong Khu sub-districts (K)	1.89	3.67	1.89	3.33
2.	An ability to work with international students (C)	2.56	3.78	3.22	3.44
3.	An ability to communicate with international students (C)	2.44	3.11	2.78	3.00
4.	An ability to work with local people, organizations, communities, and administrations (C)	3.78	3.89	2.22	4.00
5.	An ability to communicate with local people, organizations, communities, and administrations (C)	3.33	3.56	2.33	4.00
6.	A knowledge and cross-cultural comprehension between Thai and American cultures (C)	2.66	3.33	2.22	3.44
7.	An ability to create maps to record their real-life encounters with the livelihood, along with artistic and architecture heritages, as well as social and cultural practices (Ap)	3.11	3.67	3.56	3.67
8.	An ability to learn and practice various mapping techniques (Ap)	3.33	3.67	3.55	4.11
9.	An ability to learn from cross-cultural interactions through the spatial mapping projects (An)	2.89	3.78	2.89	3.56
10.	An ability to analyze architectural works and their contextual factors (An)	2.56	3.67	2.56	3.44
11.	Communication skills (listening, speaking, reading, writing) for analyzing architectural works and spatial arrangements (An)	3.11	3.78	3.44	3.67
12.	An ability for critical thinking to analyze architecture and urban space via real-life learning experiences (S)	3.33	3.67	3.44	3.78
13.	An ability for creative thinking to interpret meanings of architecture and urban space via real-life learning experiences (S)	3.22	3.44	3.22	3.56
14.	An ability for critical thinking to reflect on one's own cultural identity from the spatial mapping projects (S)	3.44	3.78	3.56	3.78
15.	An ability for creative thinking to appreciate other cultural identities from the spatial mapping projects (S)	2.78	3.33	2.67	3.33
16.	An ability to collect data/information through real-life experiences based on an ethnographic methodology (S)	3.00	3.56	3.44	3.78
17.	An ability to use data/information in many ways (S)	3.11	3.33	3.33	3.67
18.	An ability to synthesis information to present the spatial mapping projects to local communities, organizations, and administrations (S)	3.44	3.54	3.56	3.64
19.	An ability to judge the values of architectural works (E)	3.33	3.67	3.44	3.89
20.	An ability to judge the quality of spatiality and spatial configurations of built forms from real-life learning experiences E))	3.22	3.78	3.33	3.78
	Average	3.02	3.60	3.03	3.64

Sources: The authors.

*Remarks: The statistical inquiry reveals the following results.

:z for 95% CI= 1.96 declare p larger than alpha=0.05 not significant. mean1 eq: 3.60; mean2 eq: 3.64

Population standard deviation estimated using sample T-distribution used Difference between means:

-0.04 se=0.24 95% CI of difference: -0.5104 <-0.04< 0.4304 (Wald) t= -0.167; df= 8; p= 0.43588

(left p: 0.5641; two sided: 0.8718) Difference not significant at 5%

K = knowledge;   C = comprehension;   Ap = application;   An = analysis;   S = synthesis;   E = evaluation

Taken as a whole, the statistical inquiries essentially revealed that the KMITL-BSU collaborative endeavors in early-2017 contributed a number of scholarly improvements along with academic achievements for partakers from both universities. To be specific, Table 4 testified that the spatial mapping projects rendered several positive effects on the attainment and advancement of many crucial skills and abilities for the students, particularly their critical and creative thinking capabilities (Table 4, Item: 12-15).

Nonetheless, whereas the KMITL and BSU participants were able to acquire knowledge on the ways in which space was generated and utilized, the examinations on the pedagogical efficacy of the fieldwork uncovered some limitations for the method of learning through real-life experiences, notably in terms of language and cultural barriers leading to difficulties and obstacles in collaborative efforts. As shown by the Total Average Compare Mean (t-test) scores in Table 1-4, potential solutions to address such problems rested on a careful planning and management, coupled with close interactions between the instructors and students to promote group interactions, communication proficiency, and development of academic communities.

As an ending note, although the students demonstrated a substantial progress in acknowledging cultural dissimilarities (Table 4), the combined KMITL-BSU instructors noticed that they had yet to methodically develop their ability to relate one's own culture to another.[16] In spite of considerable attempts put together by the KMITL and BSU personnel, critical discussions between the instructors and students revealed that both seminar and reading sessions on relevant theoretical and methodological approaches in cross-cultural studies should be organized in advance of the field study to ensure that the participants were sufficiently prepared to meet a challenge from engaging themselves in scholarly rigorous activities.

6. Acknowledgements

Notes

[1] The six indicators fundamentally derived from KMITL and BSU's regulations on evaluating academic performance of the students. Nonetheless, they included practical concerns in organizing project-based learning (PBL) activities as well, such as student anticipations, teamwork, group dynamism, communication behaviors, language and cultural barriers etc. In short, the use of these indicators was buttressed by theoretical and methodological foundations pertaining to the conditions of the KMITL-BSU collaborative efforts in Si Satchanalai, notably the six levels of the Cognitive domain in Bloom's taxonomies to assess learning achievements (Bloom, 1956), coupled with Rockwood's notions of Cooperative, Collaborative, and Coordinative (3Cs) Pedagogy as mentioned earlier (1995a; 1995b).

[2] The selections of Nong O, Sarachit and Dong Khu sub-districts derived from their propinquity to Si Satchanalai Historical Park. In fact, the three communities had been identified as potential areas to promote sustainable developments to accommodate creative tourism (Sukhothai Provincial Administration, 2007). Si Satchanalai

and Hat Siao sub-districts were excluded from the KMITL-BSU fieldwork because they had extensively been researched. Other sub-districts in Si Satchanalai—i.e., Pa Ngio, Mae Sam, Mae Sin, Ban Tuek, Tha Chai, and Ban Kaeng—were not incorporated into the spatial mapping projects because they were located far away from the historical park, thus requiring a complex logistical network for the fieldwork.

3 During the 2017 KMITL-BSU collaborations in Si Satchanalai, all participants were encouraged to advance their critical and creative thinking capabilities by reflecting upon the following questions. For example, why did the inhabitants of Nong O, Sarachit and Dong Khu sub-districts plan, design, and construct the built environment the way they did? How did those people conceptualize, create, organize, and use space? How did they adapt formal spaces for their everyday activities and practices? What did the KMITL and BSU students learn from the spatial mapping projects in the three communities?

4 Be that as it may, a caution must be heeded that the concept of cross-cultural studies was still evolving. Therefore, there was no single definition to bind together various theoretical positions— ranging from post-colonial and post-modern theories, to hermeneutics, phenomenology, structuralism, and semiotics—characterized themselves as "cross-cultural studies."

5 Cross-cultural studies investigated the mechanism and networks by which knowledge, ideas, skills, instruments, artifacts, and practices moved across cultures. In arts and architecture, cross-cultural studies advanced awareness of built form via their relationships with methods of communication, modes of representation, and identity formations (Ben-Zaken, 2010, pp. 163-167). In the present globalizing environment, not only did cross-cultural studies develop an appreciation for cultural traditions other than one's own, but also a recognition of the interdependent nature of world society, as much as critical questions about the

legitimacy and ascendency of Eurocentrism (Jarzombek, 1999, pp. 197-198).

6 The term "cook" in Thai could also refer to an act of kneeling down.

7 Bloom (1956, pp. 1-7) proposed that the act of learning contained three domains in human mind (Figure 9). The first was the Cognitive realm, revolving around knowledge, comprehension, and critical thinking on a specific topic. Six levels of taxonomy existed in this realm (Also see: Barnes, 2017). The second was the Affective realm, where attitude described the ways in which people reacted emotionally, accompanied by their abilities to sense another living being's feelings. This domain consisted of five levels, starting from: (1) Receiving as the lowest order, (2) Responding, (3) Valuing, (4) Organization, and (5) Characterization as the highest position. The third was the Psychomotor realm, alluding to the abilities to physically manipulate a tool or instrument. This domain contained five levels in which: (1) Imitation ranked at the bottom, following by (2) Manipulation, (3) Precision, (4) Articulation, and (5) Naturalization at the zenith.

8 Bloom identified that there were three domains of educational activities as well: Cognitive as knowledge, Affective as an attitude, and Psychomotor as skills (Figure 9). In general, human beings possessed all of the three domains, but differed from each other when it came to the manners in which each individual balanced and correlated one area with another.

9 In any case, Bloom's taxonomy of learning behaviors might be thought of as the goals of learning process, implying that students should have acquired new skills, knowledge, and/or attitudes after a learning session. Nevertheless, the statistical investigations employed here solely addressed the Cognitive realm, and touched upon neither the Affective nor Psychomotor realms due to the following reasons. First, the Affective domain dealt with emotions and attitudes, which were abstract and very time-consuming to justify. As a

consequence, within a short period of time, the instructors were unable to evaluate the KMITL-BSU students in terms of changes in attitudes, emotions, and feelings that resulted in their growing appreciation, enthusiasm, motivation, and awareness. Second, the BSU partakers were nearly devoid of any prior knowledge on cultural heritage of Si Satchanalai. Hence, it would be methodologically unsound to appraise them on the Psychomotor domain in terms of tangible developments in behavior and skills, as opposed to the KMITL counterparts, some of whom already possessed a significant amount of ethnographic knowledge on the same subject matter, owing to their previous travels to the area before 2017.

[10] Since the total BSU partakers in the fieldwork were nine, the same number of KMITL students were used, so a balanced sampling population could be maintained in order to obtain statistical data from both groups equally. Moreover, the KMITL population consisted of four males and five females, whereas the BSU population comprised two males and seven females. While the ages in both groups ranged from twenty to thirty, their median age was twenty-three-year-old.

[11] In accordance with KMITL's regulations on human subject research, the questionnaires and interview guideline were cross-examined by experts in the area of ethnographic studies from HARC. Prior to the beginning of the KMITL-BSU collaborative efforts in Si Satchanalai, theses scholars verified that the Index of Item Objective Congruence (IOC) of the questionnaires were consistent with the academic objectives of the fieldwork. They also acted as the outside/independent specialists to review the interview guideline in order to ensure that a conflict of interests would not occur when appraising the learning achievements of the students. At the item-development stage in test construction, the approved questionnaires (Table 1-4) possessed a content validity of 0.85 in measuring the pedagogical efficacy through the six indicators.

[12] In statistics, Cronbach's alpha was a measure of internal consistency, exhibiting how closely related a set of items were as a group. Acting as a measure of scale reliability, it could be written as a function of the number of test items and the average inter-correlation among the items (Cronbach, 1951, pp. 297-334).

[13] As exhibited by Table 1-4, in order to determine the levels of satisfaction of the audiences, a series of mean calculations and deviations were exercised, utilizing a five-point rating scale question in which the weights assigned to each answer choice were presented in parentheses, as listed below:

- Average 4.51 – 5.00 = highest practice/satisfaction (Strongly Agree).
- Average 3.51 – 4.00 = high practice/satisfaction (Agree).
- Average 2.51 – 3.00 = medium practice/satisfaction (Neither Agree nor Disagree).
- Average 1.51 – 2.00 = low practice/satisfaction (Disagree).
- Average 1.00 – 1.50 = very low practice/satisfaction (Strongly Disagree).

[14] Yet, a critical remark could be made that this portion of the research did not contain a balanced view due to the fact that none of the BSU students were interviewed. After the end of the fieldwork in Si Satchanalai, they left Thailand on the following day. For that reason, there was not enough time to debrief any of them. However, the BSU partakers. often expressed frustrations with their Thai peers because of misunderstandings and problems caused by language and cultural barriers, and vice versa.

[15] Due to an absence of a debriefing session with the BSU students, the true reasons behind these behaviors were still unknown.

[17] The said problematic finding provided a scholarly basis to be addressed by future research, following the next biannual joint workshops and study trips between the Department of Architectural Education and Design at KMITL and its international partners.

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