

Virtual Field Trips to Explore Colonial Architecture: Enhancing Historical Comprehension and Soft Skills Through an Online Application Integrating Planning, Digital Literacy, Creativity, and Presentation

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Abstract

This study investigated the effectiveness of virtual field trips in enhancing Grade 11th students' comprehension of colonial history through the architecture (VCAH), while fostering key soft skills via a structured four-stage process: Planning, Digital literacy, Creativity, and Presentation. Utilizing digital tools such as Google Maps and Google Earth, 78 students collaboratively designed virtual travel planning to explore colonial architectural sites. The learning activities guided students through planning their routes, gathering historical information, developing online content, and presenting their group work. A mixed-methods approach was employed to assess learning outcomes. Historical comprehension was assessed through their presentation. Soft skills development mapped to the four-stage process were evaluated through structured student self-assessments using a rubric as a criterion. Results indicate that most students demonstrated measurable improvement in historical knowledge and reported significant growth in all four targeted soft skill, the statistic significant findings ($p < 0.05$). The VCAH model provided an engaging, technology-rich environment that supported both academic learning and the development of 21st century competencies. These findings suggest that well-designed virtual experiences not only can effectively integrate content learning with soft skill but can be also implemented for distance learning instead of on-site field.

Keywords: virtual field trip, colonial architecture, mobile application

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Introduction

Virtual field trips are considered as digitally mediated learning experiences that simulate the exploration of real-world environments through online platforms, multimedia resources, and interactive tools. In contrast to traditional field trips, which require physical travel, VFTs allow learners to access remote locations, historical sites, and cultural landmarks anytime and anywhere. Their significance lies in their capacity to broaden educational access, reduce logistical constraints, and create immersive, flexible learning opportunities that can enhance learners' engagement and understanding of complex subjects. As digital technologies continue to reshape educational practices, VFTs have emerged as the other valuable pedagogical alternatives that support experiential learning and foster deeper comprehension through visual, interactive, and context-rich content.

Colonial architecture is considered as the tangible heritage expressed to the cultural exchange, and socio-political transformations that shaped many contemporary societies. Studying these structures allows learners to analyze how colonial powers integrated foreign design principles with local materials, climates, and traditions, resulting in hybrid architectural forms that reflect both imposition and adaptation. In addition, understanding colonial architecture also deepens learner's awareness of heritage preservation, national identity, and the enduring legacies of colonization visible in today's urban landscapes. By exploring the symbolism, functions, and stylistic elements embedded in these buildings, learners gain a more nuanced comprehension of historical processes and develop critical perspectives on how the past continues to influence present-day cultural and spatial realities.

According to the rapid growing trend of virtual field trips in the present, author applied and integrate this learning approach into the study of colonial architecture in Bangkok's Old Town to enhance accessibility, engagement, and contextual understanding. As schools increasingly adopt digital tools to create immersive learning experiences, virtual field trips offer an effective alternative to on-site visits by enabling students to explore historical environments through interactive maps and multimedia resources. By leveraging this approach, learners were assigned to create travel planning in Bangkok's Old Town without the constraints of physical travel. This integration not only supported students in visualizing and analyzing architectural features in their authentic surroundings but also aligns with pedagogical trends that emphasize flexible, technology-enhanced learning environments which developed the essential skill in the 21st century.

Related Studies

Colonial Architecture

Colonial architecture is widely recognized in academic scholarships as an important dimension of cultural heritage, urban history, and architectural identity. Scholars argue that these built forms are not merely relics of a bygone political order but active testimonies to the social, economic, and ideological processes of colonialism. For example, the study of colonial-era monastic buildings in Panama City underscores how these structures encapsulate religious, institutional, and material values that must be preserved within the built heritage discourse (Hernández & Duarte, 2020). In Southeast Asia, Abu Bakar Abd. Raub's PhD work on hill-station colonial buildings in Peninsular Malaysia demonstrates how construction techniques, materials, and stylistic elements were localized, thereby producing a distinct "tropical colonial" architecture (Bakar & Raub, 2018). The conservation and classification of colonial buildings

also offer major contributions to architectural scholarship. In Bogor, Indonesia, Putri, Kusliansjah, and Hartono examine colonial-era structures to develop a classification system for preservation status, emphasizing authenticity and architectural value (Eka Putri et al., 2022).

In the past decade, scholarship on colonial architecture increasingly focused on its complex sociocultural roles, contested heritage, and adaptive reuse within postcolonial societies. For example, Wei and Wang (2022) explore how colonial-era buildings in Kulangsu, China, were interpreted through competing heritage discourses, it founded that both official and tourist narratives negotiate colonial legacies in nuanced ways rather than reinforcing a single negative framing (Wei & Wang, 2022). Pichet Titha (2024) examined the bungalow tradition in Thailand, revealing how colonial bungalow typologies were localized and hybridized in Siam, thereby illuminating processes of architectural adaptation that reflect climate, social customs, and identity (Titha, 2024). Meanwhile, Malied Khan et al. (2024) analyzed how colonial-era architectural styles in Aden, Yemen—particularly British Neo-Classical facades influenced contemporary design, highlight the enduring aesthetic and symbolic impact of colonial design on modern urban (Khan et al., 2024).

Virtual Field Trip

Over the decade, virtual learning has continuously developed into a pedagogical strategy. VFTs, Virtual Field Trip could transcend geographically, making inaccessible or distant learning environments to students through immersive, multimedia-rich experiences. For instance, Chen and Zhang (2023) conducted a systematic review of K-12 classrooms and found that VFTs often yield positive cognitive and affective learning outcomes, particularly in history and science (Chen & Zhang, 2023). Moreover, some studies have demonstrated that more immersive VFT significantly enhances students' sense of presence, interest, enjoyment, and long-term retention compared to 2D video formats (Makransky & Mayer, 2022). In addition, VFTs have been shown to support equitable, sustainable, and collaborative learning. Leininger-Frézal and Sprenger (2022) illustrate how VFTs in binational teacher training foster experiential learning (Leininger-Frézal & Sprenger, 2022).

Over the past decade, the development of virtual field trips (VFTs) delivered via mobile applications has gained momentum, especially in educational contexts that emphasize inquiry-based and geographically rich learning. For instance, Salsabila developed a mobile-learning virtual field trip app grounded in Education for Sustainable Development (ESD), integrating video, e-modules, and quizzes to support self-directed learning among primary students (Salsabila et al., 2022). Similar to Nakraksa and Khlaisang (2020) proposed a VFT model for upper secondary students that combines the geographic inquiry process with 3D mapping, enhancing spatial thinking and investigative skills (Sriarunrasmee et al., 2015). More recently, virtual game-based field trips operate on mobile devices (Bengel & Peter, 2024). These studies illustrate how mobile-based VFTs are evolving from simple immersive visualizations to sophisticated, interactive learning environments.

Description of Virtual Field Trips to Explore Colonial Architecture in History

Background and Overall Structure

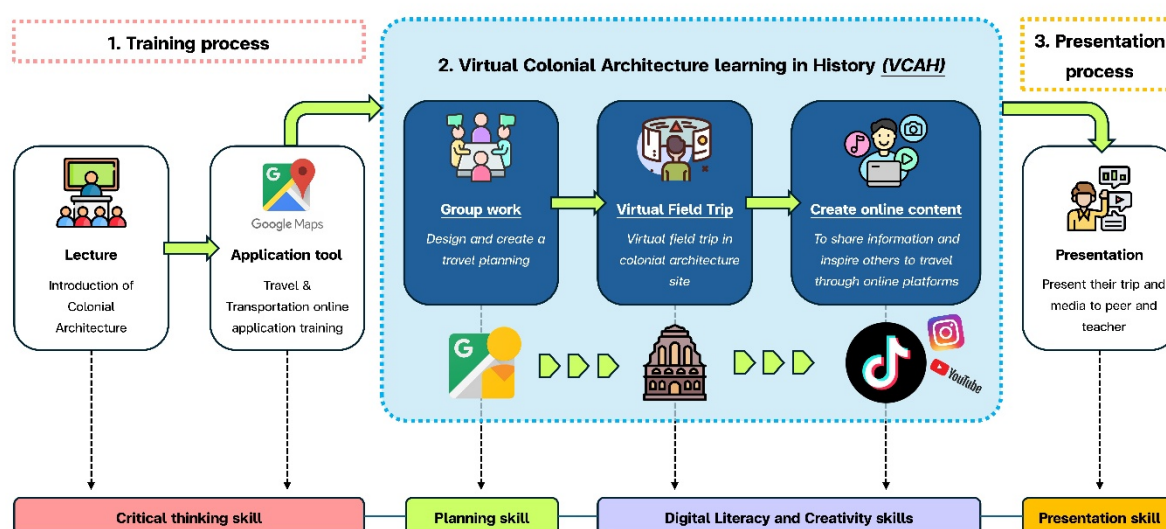
Field Trip's considered as an extra curriculum which's necessary for learner in every level. In particular, the senior high school level, Grade 10th–Grade 12th student in Thailand. In case of Engineering Science College, learners are required to study world history during imperialism

and colonialism period, which's consort with story-based learning as a core program. According to the program's background, authors designed new active learning approach within classroom. By applying mobile learning, and technological tools to study colonial architecture and history through online applications.

This learning session was divided into 3 main processes. Firstly, training process initially started from lecturing the fundamental knowledge about colonial architecture within 20 minutes. Then, learners were trained the online application tools, such as Google map, Google Earth, Google Street View. From this process, learners were anticipated to develop critical thinking skills. Secondly, the Virtual Colonial Architectural field trip, the main learning process that learners did task collaboratively in group. They were required to create travel planning describing the public transportation route from the campus to the colonial historical site in Bangkok in infographic format. Then, they continue to create online content in order to present the transportation route, history, value of those colonial historical sites. From that process, learners developed three essential skills: Planning, Digital literacy, and Creativity skills through online applications. For instance, YouTube, TikTok, etc. Lastly, the presentation, they presented the learning outcomes in class.

Figure 1

The Overall Framework of Virtual Colonial Architecture in History



Research Design

Participants

The participants in this study were 78 students in Grade 11th of Engineering Science College, King Mongkut's University of Technology Thonburi. All participants enrolled in ESC515 The Renaissance course. All participants already learned the history of Colonialism and Colonial Architecture. All participants were assigned to create travel planning and VDO presentation virtually.

Procedure

This study is divided into 3 main processes and 6 sub-steps. Each step was held during class time, and learners continued the work as homework. In each step, the teacher focused on

helping learners develop various skills, such as planning, creativity, online information searching (digital literacy), and persuasive presentation. The details were shown on the table below and Figures 2–3.

Table 1
Virtual Field Trips to Explore Colonial Architecture

Main Process	Sub-Step	Activity	Application Tools
1. Training process	1. Lecture session (20 min)	The instructor gave an introductory lecture about the history of colonial architecture in Thailand and lets the students practice their information-searching skills and analyze the credibility of the sources.	Google Gemini, ChatGPT
	2. Application training (20 min)	The teacher explained how to use travel - transportation applications, such as Google Maps and Google Earth, to the students.	Google Map, Google Earth, Google Street view
2. Virtual Colonial Architectural field exploration in history (VCAH)	3. Information searching and data analysis (20 min)	The teacher divided learners into groups and gave each group a task. Each group chose three colonial architectural buildings in Bangkok. Then, they were required to research the history and value in the context of architectural style.	Google Gemini, ChatGPT
	4. Design the travel route (40 min)	The student created a travel planning, which's comprised of transportation routes from the campus to the historical sites, and three colonial buildings.	Google Map, Google Earth, Google Street view, Canva
	5. Create online content (homework)	The students gather the information and create a storyboard during class. Then, they edit it into online content as homework using applications such as TikTok, Instagram, or YouTube.	Canva, TikTok, Instagram, YouTube
3. Presentation	6. Presentation and assessment (120 min)	Each group presents their Virtual Colonial Architectural field exploration in history (VCAH) for the class to watch, and the students discuss the credibility, content appeal, and appropriateness of the media. After that, the students complete a self-assessment of their skills before and after the activity.	Canva, TikTok, Instagram, YouTube

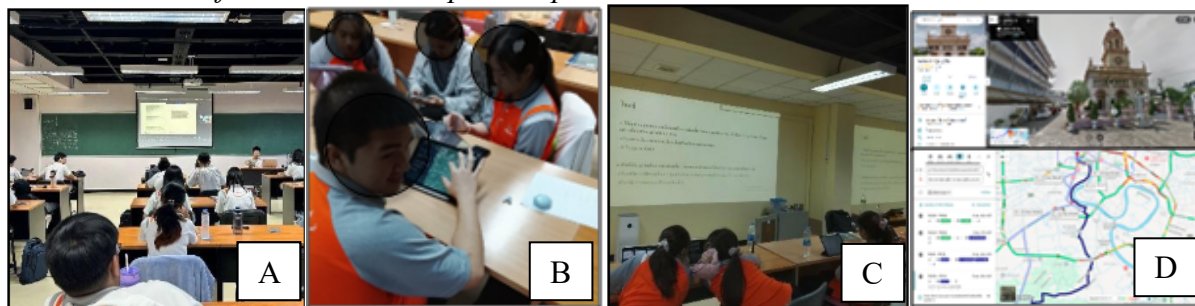
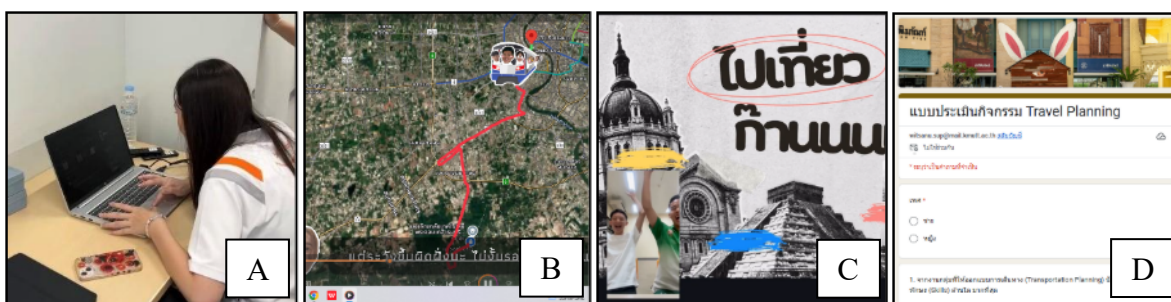
Figure 2*The Procedure of Virtual Field Trips to Explore Colonial Architecture*

Figure 2 showed the steps learners follow in their learning. It started from attending a lecture (2A), then practicing the use of important applications (2B), followed by forming groups to research the assigned information (2C). After that, each group begins designing their exploration route (2D). After that, each group began searching for information to create online media. They focused on providing details about the place, its highlights, points of interest, and inviting tourists to visit. They also explained how to travel to the location and estimated the costs (3A–3C). Afterward, the students presented their work and evaluated their learning (3D).

Figure 3*The Procedure of Virtual Field Trips to Explore Colonial Architecture*

Data Collection and Data Analysis

In this study, there were 2 instruments for evaluating learning achievement. First, ability to create online content and understand historical content. In this assessment, it was evaluated by the instructor based on the rubric (Hardy & Iwatani, 2021). For the soft skill score, author applied OECD Assessment rubric (OECD, n.d.). Second, the soft skill development from self-assessment before and after participating in the virtual field trip. Using self-rate on a scale of 1–5 in each questionnaire. After that, all of data will be analyzed by statistical program using t-test.

Results and Discussion

Learning Achievement by Teacher

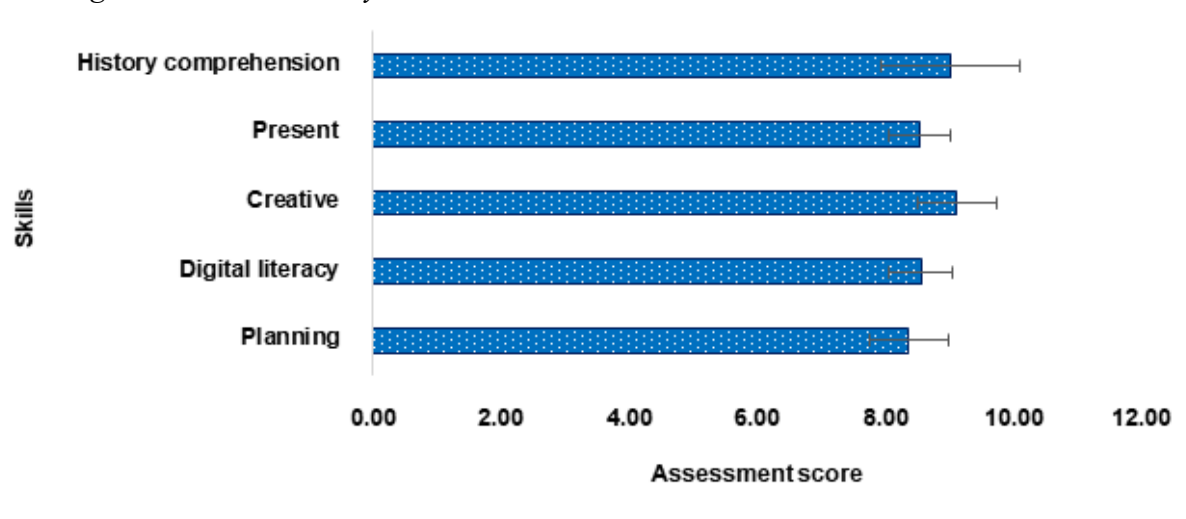
From the evaluation of the students' virtual field trip projects (Figure 4), which assessed various skills such as historical comprehension, presentation, creativity, online information searching and analysis (digital literacy), and planning, it was found that learners were able to choose interesting historical locations in Bangkok where feature traces of colonial architecture, such as the Museum Siam, the Ministry of Defence, and the Saranrom Palace. They were also

able to search for relevant information accurately and plan travel routes to these locations, present their work in engaging online media formats. Most learners received an average score between 8.38 and 9.13 out of 10, with creativity and history comprehension being the highest-scoring skill (Figure 5).

Figure 4
Learner's Assignment Outcome



Figure 5
Learning Assessment Score by Teacher

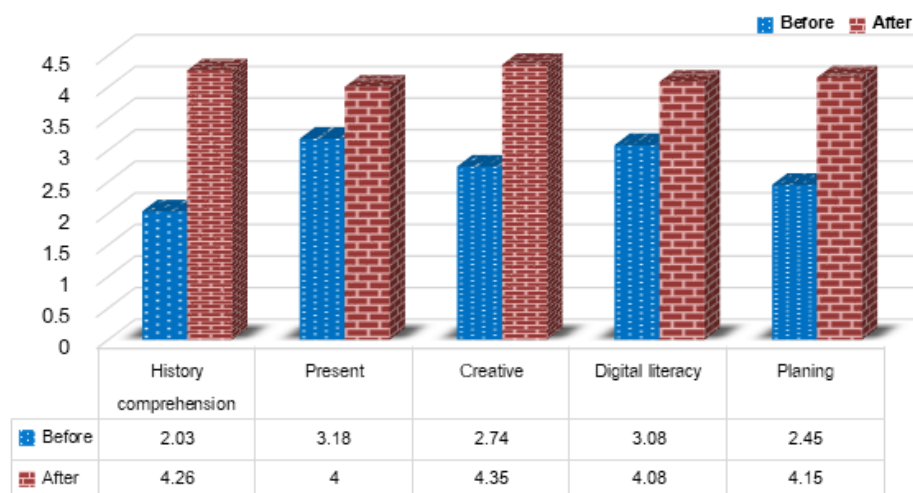


Student Self-Assessment Score

After completing the activity, all learners filled out a self-assessment to compare their skills—such as history comprehension, presentation, creativity, online information searching and analysis (digital literacy), and planning—before and after the activity. The results showed that students' self-assessment scores in all skills increased significantly after the activity, with statistical significance at $P < 0.05$, as shown in Table 2 and Figure 6.

Table 2*Student Self-Evaluation Score Compared With Before and After the VCAH Activity*

Skills	Experiment	<i>n</i>	Mean±SD	<i>t</i>	<i>P</i>
History comprehension	Before	78	2.03±0.45	11.54	< 0.001
	After		4.26±0.56		
Present	Before	78	3.18±0.94	4.21	< 0.001
	After		4.00±0.48		
Creative	Before	78	2.74±0.56	7.82	< 0.001
	After		4.35±0.59		
Digital literacy	Before	78	3.08±0.51	4.06	< 0.001
	After		4.08±1.42		
Planing	Before	78	2.45±0.56	8.83	< 0.001
	After		4.15±0.69		

Figure 6*Comparative Learning Assessment Score by Teacher*

Conclusion

This study aims to study the effectiveness of Virtual Field Trips exploring Colonial Architecture Site, which assessing Historical Comprehension and Soft Skills, Planning, Digital Literacy, Creativity, and Presentation. This enables learners to develop and apply the essential skill through virtual visiting. Including the historical comprehension associated with World history during Imperialism and Colonialism period. As well as the ability to apply technology in learning, by using applications or online platforms as tools. According to the result, it concludes that learners could develop and increase in both the context of academic comprehension and soft skill from that approach significantly. Nevertheless, this learning approach should be adapted to others field trip where they will answer those hypotheses.

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