The Collaborative Mobile Ancient Route Learning for Supporting Geo-History Knowledge and 4C's Skill Through Google Map Applications

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Abstract

Since the advancements in technology, it has led to a transformation in various learning approach. The convenience to access information from online databases has rapidly prompted schools worldwide to start incorporating certain technologies into teaching and learning practices as deemed appropriate. In this research, the Google Maps application was utilized to design learning experiences for Grade 10th students to enhance their comprehension of Geography and History including The 4C's skill, which was achieved from the Dvaravati field trips, and assessing learning outcomes by creating the ancient route maps through the Google Maps application. According to the learning achievement, and the self-assessment of 4C's skill founded that most of learners could develop the 4C's skill and gain a deeper comprehension in term of knowledge content after exploring the CMGH field trip significantly, the statistic significant findings ($p<0.05$). In addition, most of learners could accurately create the ancient maps according to geographical principles, it can be concluded that the collaborative mobile learning for geography and history learning could support the acquisition of Geography and History knowledge effectively.

Keywords: Collaborative Mobile Learning, Google Map, 4Cs Skills

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Introduction

Geography education is basically developed toward the trendy technology because it's necessary to use tools to study and research the physical change in Geography. In the last decade, Geography information systems considered as the potential instrument to support classroom learning through student driven inquiries in many aspects of natural and social domains. In particular, the use of Project-based learning, and Problem-based learning (PBL). Nevertheless, GIS has been considered as the fundamental system studying, analyzing Geography since 1960.

Accessing to technological education remains a core barrier in developing education. However, in this decade, IOT, Internet of Things covered and also disrupt those obstacles. Learners can even use smartphone to search any data and knowledge through online database. As learning geography, In addition to GIS, there are various mobile applications supporting Geography education accessibly. For instance, Google map, Google Earth, Map Me, Here We Go, etc. In addition to support learning, it also supports the navigation.

In this present, mobile applications 's necessary in every aspect of daily life inevitably. It's considered as an essential part of both virtual and physical learning. By the way, exploring, experiencing in the field can be an absolute advantage. Learners can see and visit in the real world. According to the significance of mobile applications, and field learning, author studied the advantage of hybrid learning between Google Map application, and field trip in Dvaravati Route in ordered to create the ancient route map in Dvaravati period of Thailand.

Related Studies

Collaborative Learning

Collaborative learning is the educational approach of using groups to enhance learning through working together. Generally, groups of learners work together to solve problems, complete tasks, or learn new concepts. This approach actively engages learners to process and synthesize information and concepts, rather than using rote memorization of facts and figures. In addition, this approach allows learners work together on projects, where they must collaborate as a group to understand the concepts being presented to them. Rizki Amalia (2018) proposed that collaborative learning is significant learning approach supporting skill need in 21st century (Rizki Amalia, 2018). There are many benefits of collaborative learning as follow: Develop group discussion and leadership skill, increase learner skill and knowledge, improve relationship among learners, Improve knowledge acquisition and retention.

Nowadays, learning approaches are rapidly develop consorting with accessible technology and tool in education. Students could individually learn through many online-databased content, in particular, after the epidemic of Covid-19. Nevertheless, it can't deny that Collaborative learning remains an effective approach. Especially in Geography education, Yangzom and Phu-Ampai (2017) opined that students could get a high level of satisfaction, learning behavior toward collaborative in teaching topographical map in Grade 10th students. Similar to Jochecová et al. (2022), studying the potential of CIVEs, the collaborative immersive virtual environments to create hypsography map (Jochecová et al., 2022). Nevertheless, the hypothesis that collaborative learning had limitations in some levels, Huh

and colleagues (2021) opined that working in small group is more effective in K-12 students studying Geography task.

Mobile Learning and Google Map

Mobile learning, mLearning, is an approach of accessing learning content through mobile devices. This approach empowers learning at the point of need, enabling users to access content whenever and wherever suits them. The most significant advantage of mLearning is to focus the ability of learners to choose when and where they want to access means that they can go at their own pace, increasing engagement and improving knowledge retention. There are several significances of mLearning in particular the context of academic. First, its convenience to microlearning content through video, gamification, and more interactive content. Second, the social learning engagement. Third, the seamless access through IOT.

MLearning's considered as a widespread learning approach for decade. It has an important role supporting Geography education in every level. Lan and Wang (2010) studied the effect of GPS and E-map in the Junior High School students. Instructor assigned them to find the direction in Geography mLearning. In addition, it also popularized use to teach in the higher education. Ganguly (2023) used mLearning through the integrated GPS in K-12 students. Like Silaban et al. (2023), she agreed that smartphone is a portable device supporting a geographical learning. In particular, field study. Nevertheless, this present, Augmented reality (AR) is gradually applied to this field obviously. Falk and Chatel (2017) created SmartGeo as an augmented reality as the other alternative Geography learning application.

There are several mobile applications assisting the navigation and geographical database. They are necessary for daily life in many contexts. For instance, navigation, journey, tourism, and education. Google Map is considered as a pillar of navigation with more than 1 billion monthly users. It was the most downloaded map and navigation app in the US in 2022, with 9.12 million downloads. It can access and connect with others application, which involve. In addition, it can access the real view in each place that users want to observe through Google Street View. According to its convenience, its system also present terrain on the bird eye view too. Lazaro and Duart (2023) opined that Google map could increase the comprehension in map and geography.

Nowadays, Geography education isn't limited only in mapping terrain, It can promote to others science, knowledge, and economy. In 2010s, Google map was the most effective navigation application to use in learning Geography. At the same time, its technology also can support tourism in rural area. Ahmad and colleagues (2023) used this software to support rural mapping and toponym inventory promoting tourism in Central Java, Indonesia. It could pin location as tourist attraction, restaurant, convenient store, and accommodation. Furthermore, it was applied to the virtual teaching. Cahyono and Sidiq Anggoro (2017) used Google Map as the learning approach for Tourism Geography course. It could support tour guiding and planning proficiently.

Description of Overall Conceptual Framework

Background and Overall Structure

Field trip is an essential learning activity for Social studies, students explored the real world historical site to learn History through Architecture, Antique, and Geography. Mobile

learning was applied to assist learners through the navigation and map application. Learners were assigned to use mobile application creating the ancient map toward Dvaravati route in ordered to comprehend the relation of location and geography affecting to human civilization in Dvaravati period. Dvaravati trip are a required field trip for Grade 10th students in the Engineering Science Classroom, King Mongkut's University of Technology Thonburi.
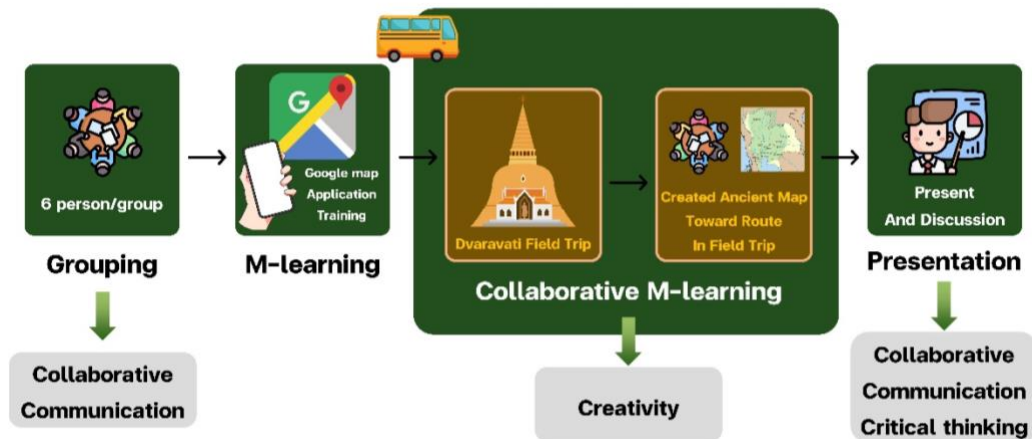

Figure 1: Overall Structure of Learning Process in Collaborative Mobile Learning for Geography and History Learning (CMGH)

Research Design

Participants

The participants in this study were 76 students in grade 10th of Engineering Science Classroom, King Mongkut's University of Technology Thonburi. All participants enrolled in ESC422 The Navigator course. All participants already learned the history of Dvaravati and Sukhothai Kingdom. The participants received google map training before participating in the field trip around Nakhon Pathom and Ratchaburi Province for 3 days and 2 nights.

Procedure

The learning process in this study will start with all of the participants enrolled in the ESC422 course. After that, the process will be divided into 5 parts as presented in figure 2. Part 1 will start with all of the participants being divided into groups (6 person/group) (A). In part 2, all participants participated in google map training activity in the classroom (B). Next, part 3 will start with all participants participating in a field trip for 3 days and 2 nights (C). During the field trip participants will listen to a lecture on the history of each area. After that, participants surveyed the area using google map on their mobile phone as a tool. Then, part 4 will start with participants designing ancient maps of each area from surveys through google maps on their mobile phones (D). Finally, part 5, participants will present their map to peers and teachers to evaluate learning outcomes (E).
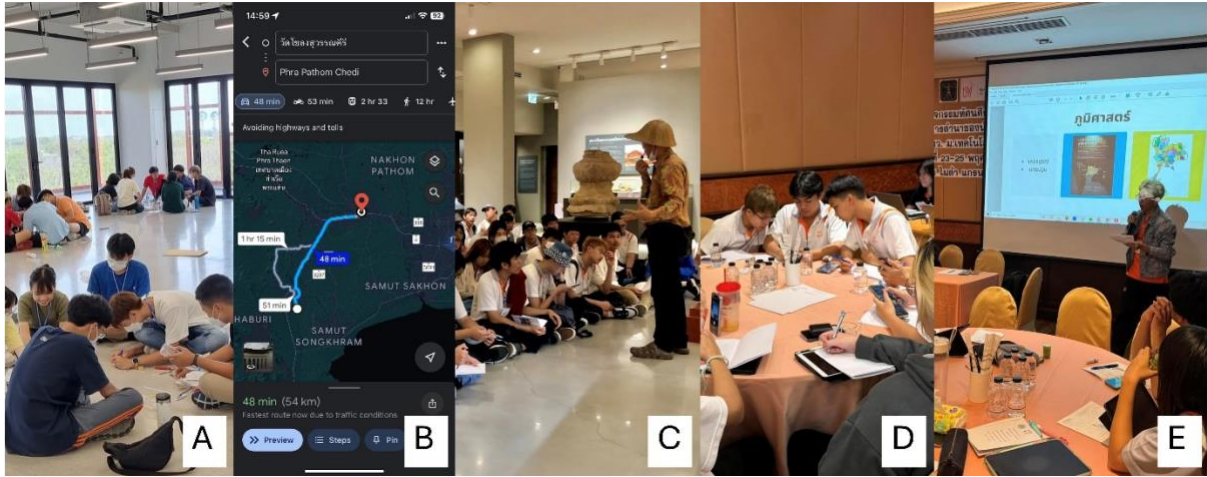
Figure 2: Learning Process in Collaborative Mobile Learning for Geography and History Learning (CMGH)

Data Collection and Data Analysis

In this study, there were 2 instruments for evaluate learning achievement. First, ability to applied google map for drawing an ancient map and understanding of geography knowledge of student. In this assessment it will be evaluated by the teacher based on the rubric. Second, ability to understand in geography and history from self-assessment before and after participating in field trip. Using self-rating 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 Evaluation

From some of students' work as presented in figure 3., it was found that the students were able to apply the drawing of ancient maps from surveys using the google maps application on their mobile phones very well. Because the travel route can be clearly specified. In addition, the scale of the map can be specified appropriately and correctly according to geographic principles. Therefore, when evaluating according to rubric, the score of most students has an average of 7.62 ± 0.63 out of a full score of 10.
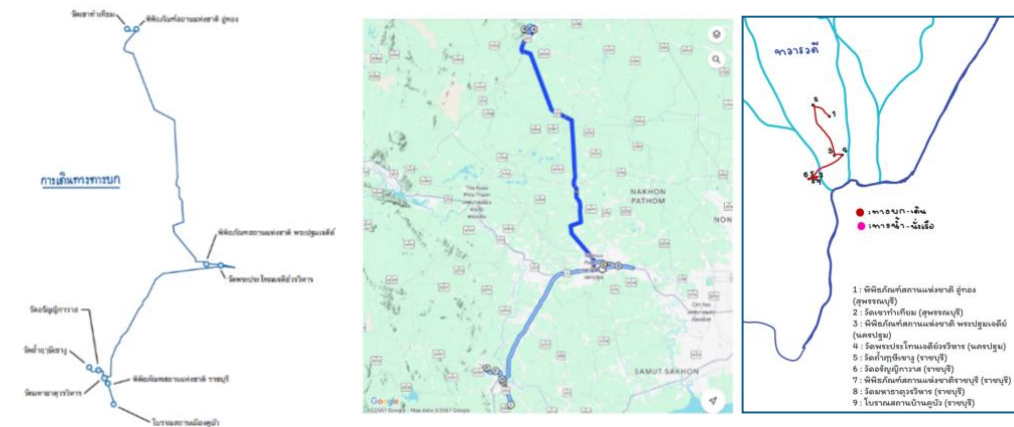

Figure 3: The Ancient Map From Learner's Assignment

Students' Self-Assessment Score

Based on the self-assessment result of the understanding in geography and history knowledge of student before and after participating field trip. It was found that most students perform at the higher score of learning achievement after participating field trip as shown in table 1. This implies that using the google map application on their mobile phone to surveys the area while participating in field trip can promote students understanding in geography and history at a higher level as shown in Table 1 and Figure 4.

Table 1: Students' Self-Assessment Score

Skills	Experiment	n	Mean±SD	t	P
Geographical comprehension	Before	76	2.22±0.08	15.35	*<0.001*
	After		3.87±0.09		
Historical comprehension	Before	76	2.20±0.08	11.55	*<0.001*
	After		3.80±0.09		
Collaboration	Before	76	2.87±0.08	12.25	*<0.001*
	After		3.89±0.09		
Creativity	Before	76	2.75±0.08	13.11	*<0.001*
	After		3.78±0.05		
Communication	Before	76	2.68±0.07	11.51	*<0.001*
	After		3.57±0.09		
Critical thinking	Before	76	2.96±0.08	12.15	*<0.001*
	After		4.02±0.03		

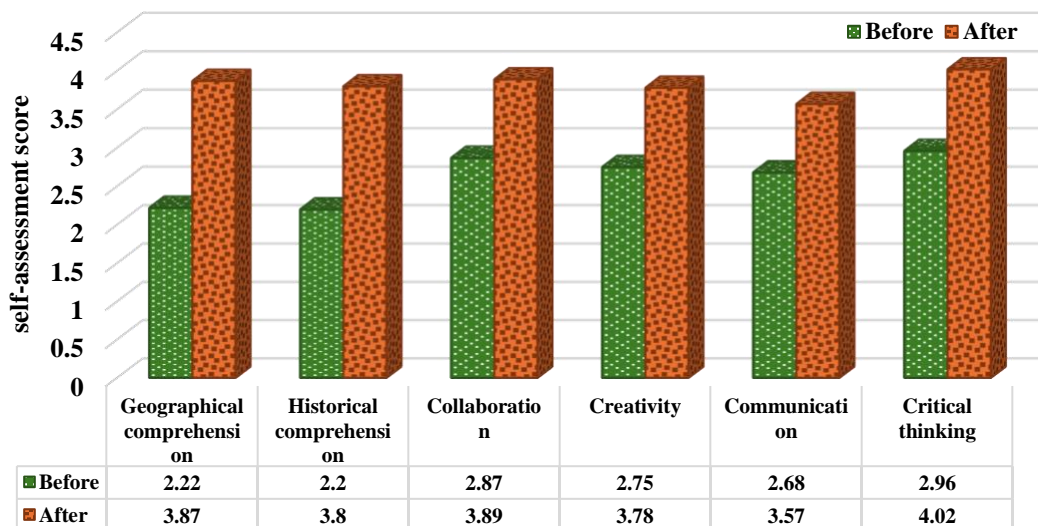|	Geographical comprehension	Historical comprehension	Collaboration	Creativity	Communication	Critical thinking
Before	2.22	2.2	2.87	2.75	2.68	2.96
After	3.87	3.8	3.89	3.78	3.57	4.02

Figure 4: Students' Self-Assessment Score

Conclusion

In this study investigated the development result of understanding in geography and history knowledge of students through a mobile-learning collaborative field trip. From the results can conclude that most student are able to use application on their mobile phones such as a google map application as a tool to help them study in geography and history. From this

study, it can be inferred that if teachers choose an application (M-learning) that are appropriate for students' learning. It may result in students being able to learn faster than teaching in a lecture-based learning only.

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