Exploring the Impact of Organizing Events to Self-Learning Behavior on an Online Learning Platform

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***Abstract*—The primary objective of this research is to investigate the patterns of self-learning behavior on an online learning platform and assess the effects of organizing stimulating events for learners. Our data collection focused on three key courses centered around game coding over a period of six months. During this duration, three distinct types of events were conducted: live broadcasts, activities in an auditorium, and onsite workshops. This paper presents the analysis and findings regarding the impact of these events on the learners' progress and engagement.**

I. Introduction

Several studies have explored the motivation of online learning, and the factors that influence it. In a study by Chen and Jang [1], they found that the quality of online course content, instructor communication, and interaction with peers positively affected students' motivation towards online learning. Additionally, other studies have suggested that extrinsic motivation, such as the importance of obtaining a degree, can also drive online learning motivation [2].

In addition to these traditional approaches, organizing events is emerging as an effective method of enhancing students' motivation in online learning environments. In a study by Choi and Kim [3], they found that organizing events such as webinars, guest lectures, and workshops, can significantly enhance students' motivation and engagement in online learning. Moreover, the study found that students who attended these events had higher levels of self-efficacy and perceived control over their learning.

II. Methodology

A. Research Questions

The purpose of this study is to explore different aspects of online learning behavior among students enrolled in coding courses on an online learning platform. Specifically, we aim to answer two research questions. Firstly, we want to determine if there are significant differences in the way students learn online across different courses. Secondly, we investigate how various events influence students' access to the online learning platform.

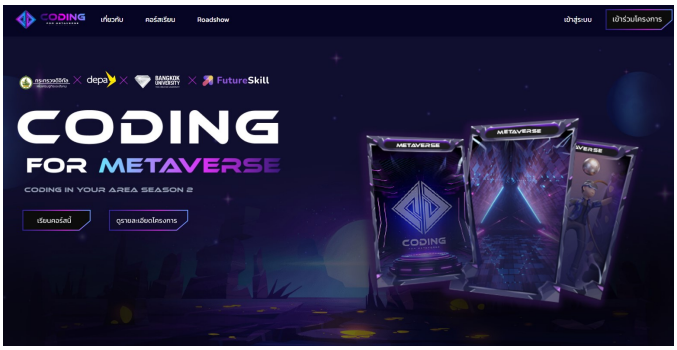

Fig. 1: Online learning platform on "Coding for Metaverse" in Thai.

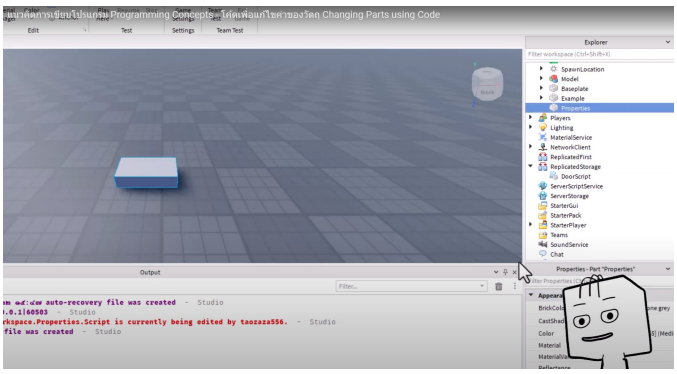

Fig. 2: Video content in the course, for example, how to change an object part by coding in Roblox studio.

B. Sample and Sampling Methodology

To address the research questions, the sample will consist of students enrolled in the "Coding for Metaverse Project" courses on the online learning platform as a homepage shown in Figure 2. This project was launched in November 2022. All students with platform access from November 2022 to April 2023 (a six-month period) will be included in the sample.

The participants were school students who dedicated their after-school hours to self-study the course. Most of them were

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in grades 5 to 12. As depicted in Figure **??**, the instruction for the courses relied on video clips in Thai. These videos guided students through workshops where they engaged with computer-based tasks while watching. Moreover, we introduced an avatar as the instructor in the video clips to enhance their appeal, especially among school students.

III. Course Studying in the Online Learning Platform

There are a set of three courses as follows: (1) Introduction and basic programming, (2) Game programming, and (3) Game publishing and profit making. Among this set of three courses, a sequential approach is essential. This dictates that course 1 must be satisfactorily accomplished before advancing to course 2, and subsequently, course 3. Table I displays the study sample: 16,217 users, divided into 8,221 for course 1, 5,228 for course 2, and 2,768 for course 3. Mean study times were 1.28 weeks (SD = 0.725) for course 1, 1.35 weeks (SD = 0.805) for course 2, and 1.41 weeks (SD = 0.873) for course 3, all with minimum and maximum study times of 1 to 4 weeks.

TABLE I: Descriptive Statistics

Courses	N (users)	Mean (SD) in weeks	95% Conf. (weeks)
1 (3.5 hrs.)	8,221	1.25(0.73)	(1.2676,1.3012)
2 (4.5 hrs.)	5,228	1.35(0.81)	(1.3314,1.3736)
3 (1.2 hrs.)	2,768	1.41(0.87)	(1.3847,1.4426)

A. Learning Behavior of Students

TABLE II: Kolmogorov-Smirnov Test

	D	p
Time	0.481	<0.001

TABLE III: Kruskal-Wallis Test

	χ^2	df	p	ε^2
Time	64.4	2	< 0.001	0.00397

TABLE IV: Pairwise Comparisons - Time

		W	p
Course 1	Course 2	7.21	< 0.001
Course 1	Course 3	10.77	< 0.001
Course 2	Course 3	4.42	0.005

The objective of this study was to investigate whether there is a significant difference between the online learning behavior of students across different courses. The Kolmogorov-Smirnov test results revealed that the data was not normally distributed (D = 0.481, p $<$ 0.001), thereby indicating the suitability of non-parametric tests. Consequently, the Kruskal-Wallis test was conducted to examine if the median online learning behavior of the students differed significantly among the three courses. The Kruskal-Wallis test results indicated a statistically significant difference between the courses (χ^2 = 64.4, df = 2, p $<$ 0.001), suggesting that the courses had different online learning behaviors. The effect size (ε^2) of 0.00397 indicated a small effect size.

(a) An auditorium-in event.

(b) An onsite workshop event.

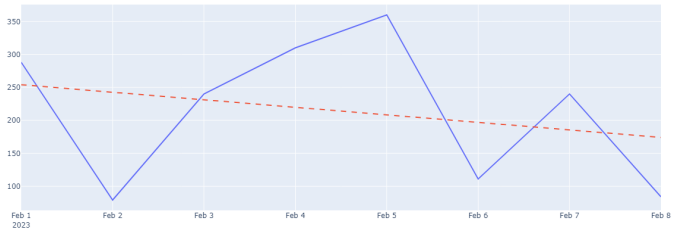
Fig. 3: Number of learning accesses following organizing events in (a) an auditorium setting and (b) a workshop.

Subsequently, post-hoc pairwise comparisons were performed using the Dwass-Steel-Critchlow-Fligner method to determine which courses differed significantly. The results showed that course 1 had significantly different online learning behavior compared to both course 2 (W = 7.21, p $<$ 0.001) and course 3 (W = 10.77, p $<$ 0.001). Additionally, course 2 had significantly different online learning behavior compared to course 3 (W = 4.42, p = 0.005).

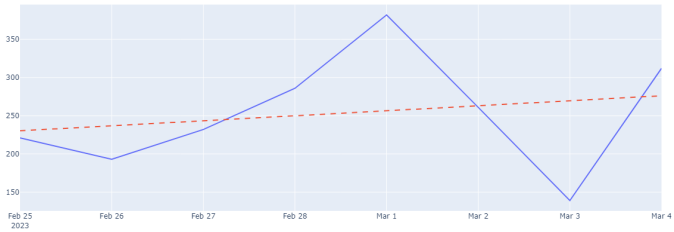
To answer the first research question, we assume that students who pay more attention will spend less time studying. Based on this, we can draw the following conclusions: (1) Students pay more attention to the first course they take. (2) Even though the third course requires much less time than the first one, students might feel tired or uninterested by the time they reach it.

IV. The Impact of Events on Learning Behavior

The literature review has highlighted the significant role that events play in enhancing students' motivation and engagement. In this section, we investigate the influence of organizing events on motivation in online learning environments. To do



(a) A non-influencer.



(b) An influencer with 2M followers.

(c) An influencer with 200K followers.

Fig. 4: Number of learning accesses following a live broadcast event by (a) a non-influencer, (b) an influencer with 2M followers, and (c) an influencer with 200K followers.

so, we collect data on the number of platform users over time for three distinct event types: live broadcasts, activities in an auditorium, and onsite workshops. The onsite activities are shown in Figure 3.

The analysis, illustrated in Figure 4, demonstrates distinct patterns among the three influencers. The first influencer (b) exhibited a positive slope of 6.5476, indicating a growth in the number of users during and after the event. Conversely, the second influencer (c) displayed a negative slope of -20.0238, indicating a decline in user numbers post-event. Similarly, the live broadcast by the non-influencer (a) exhibited a negative slope of -11.4286, signifying a decrease in the number of users following the event.

As shown in Figure 5 (a), the activities in a meeting room are events where users can participate in various interactive activities, such as puzzles and quizzes. The event had a positive slope of 6.4048, indicating an increase in the number of users during and after the event.

As shown in Figure 5 (b), the workshops are events where users can participate in training sessions and hands-on activities related to coding and software development. The College Primary Workshop had a positive slope of 17.1667, indicating a significant increase in the number of users during and after the event.

In conclusion, to answer the second research question, the

(a) An auditorium-in event.

(b) An onsite workshop event.

Fig. 5: Number of learning accesses following organizing events in (a) an auditorium setting and (b) a workshop.

graph depicts fluctuations in platform user numbers over time, corresponding to events conducted during that period. The analysis of these events offers valuable insights into learning behavior. Workshops were found to be the most effective in attracting and retaining learners on the online platform. The onsite workshop showed the highest increase in platform access, followed by activities in a meeting room and live broadcasts by the first influencer. Conversely, live broadcasts by the non-influencer and the second influencer had a negative impact on platform user numbers. These findings suggest that organizers should prioritize hosting workshops and interactive activities to engage and retain users. Additionally, careful planning and execution of live broadcasts are recommended to ensure a positive impact on learning behavior.

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