Online Learning and Emergency Remote Teaching in Higher Education during COVID-19: Student Perspectives

Kevin Fuchs

***Abstract*—There is no universal response for institutions in higher education on how to handle the continuity of education during the radical transformation all across the world during COVID-19. Online learning is often used as a synonym for emergency remote teaching, however, both methods have fundamentally different characteristics that differ in implementation and effectiveness. This study aims to investigate student perceptions concerning online learning and emergency remote teaching (ERT) during the global pandemic. An importance-performance analysis (IPA) was used to determine the perceived satisfaction of undergraduate students. This mixed-method study expands earlier research addressing concerns with ERT and adds to the body of knowledge by investigating how ERT is perceived by university students in Northeastern Thailand. Responses from a self-administered survey were collected and analyzed (n=287). Based on descriptive analysis, it was decided to conduct 14 unstructured interviews to investigate particular findings more thoroughly. The study identified that the students largely view ERT as inferior compared to traditional classroom teaching. Moreover, the students claimed both lack of social interactions with peers and inability to seek academic support as the primary reasons. This study informs educators about student perceptions and preferences during these extraordinary circumstances of uncertain duration.**

***Index Terms*—Online learning, remote education, remote teaching, technology-enhanced learning, higher education, undergraduate students.**

I. Introduction

COVID-19 has radically transformed people's lives all across the world. Authorities have encouraged or mandated social isolation, and people have been advised to travel as little as possible. In education, the same safety precautions apply [1], [2]. Online learning, on the other hand, has not just been used in times of crisis. Online learning has been considered as a viable substitute for face-to-face learning since the emergence of the internet and networking technology-enabled learners to study regardless of their location [3]. Pacing, student–teacher ratio, modality, pedagogy, the role of the student, the role of the teacher, online communication synchronization, the function of online evaluations, and feedback are all important aspects of efficient online learning [4]. These classes do not demonstrate sufficient quality since existing class designs are recognized to be simply temporary responses to the emergency need for remote teaching, with greater control given to administrators than professors in creating, developing, and implementing curricula [5].

Furthermore, because emergency remote teaching does not have a planned class design like traditional online learning, both professors and students have trouble adapting to it [1], [6]. Institutions implementing emergency remote teaching should consider the support that is simple to use, effective, and addresses factors of distance learning such as interactions with students and their parents or guardians, required infrastructure, personnel ability to operate emergency remote learning, meeting learning needs, navigating difficulties faced by students and personnel, and student outcomes, performance, and feedback [4], [7]. Furthermore, emergency remote teaching methods varies from college to college, and some universities have online learning systems while others do not, resulting in differing impressions of the learning process and effectiveness among students, who are, after all, the consumers of education [8]. Additionally, other unforeseeable changes in the environment, such as war, regional conflict, and other natural disasters, may occur, necessitating the need to plan for and conduct teaching via remote imaging systems [9].

II. Study Background

The universality of information technology has been influencing almost all aspects of our lives: the way we work, interact with others, process data into information, analyze and share information, entertain ourselves, and enjoy tourism [10]. COVID-19 has resulted in complete schools closures all across the world. As a result, education has changed dramatically, with the distinctive rise of e-learning, whereby teaching is undertaken remotely and on digital platforms. As shown in a previous study by Martin, Stamper and Flowers [11], effective time management was the second-highest-rated advantage of online education, with students having more freedom to control their time and not being constrained by predetermined schedules. Another study by Fuchs [9] found that, depending on the teaching methods used, the ability to use multiple virtual classrooms at the same time could improve student interest and involvement, allowing for smaller group discussions during online lectures. Furthermore, a combination of time and location versatility was claimed as one of the key advantages of online education [2]. The benefit of place and time flexibility works both ways, allowing both the students and the educators to each choose their preferred work

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The author is with the Faculty of Hospitality and Tourism, Prince of Songkla University, Phuket 83120 Thailand (e-mail: kevin.f@phuket.psu.ac.th).

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environment. According to Downes [2] in his Connectivism-based educational theory, the online medium provided an opportunity and experience to connect with students from various disciplines, backgrounds, and cultures.

As a result of the pandemic, worldwide citizens have been forced to impose extensive community and school closures, leaving only virtual contact as a means of continuing to learn [3], [4]. Though government officials in the country's higher education institutions have advocated for alternative curriculum modes based on the institutions' existing resources, some universities are unable to make a sudden paradigm shift due to unforeseen constraints on educational adaptation to digital technology in the online learning environment [6]. Kyne and Thompson [12] conducted a case study that described many challenges faced by students during their fully online semester. Completing lab-based tasks, navigating Moodle (a Learning Management System), and engaging with online content were among them. If the course content is not carefully and intentionally designed, "undergraduate students claim a lack of socialization with peers and low engagement with the course materials" as primary reasons for their dissatisfaction, according to a similar study [9].

Furthermore, Wilcox and Vignal [13] discovered that the two most common difficulties students faced as a result of ERT were associated with 1) course inception and 2) learning environment. The most frequently mentioned issue in the above group was unreliable Internet access that hindered the students' learning experience. Participants said the learning process was uncomfortable and unpleasant, according to Gelles *et al*. [3]. Although there are many benefits and opportunities in the online education paradigm, it should be recognized that it is not without its difficulties and flaws. Due to the prolonged suspension, this is an opportunity to shift students' attention to the virtual world and implement a method to debate real-life teachings in freestyle and unstructured manner [13]. ERT promotes academic freedom by allowing teachers to make instructional decisions depending on the current scenario to optimize students' learning chances despite the crisis. Similarly, ERT can help teachers think on the ongoing need for novel ways in remote education to encourage all students to form stronger bonds with their teachers and peers in a virtual classroom [14].

Student engagement pertains to the time and physical energy that students expend on activities in their academic experience [15]. Engagement pertains to the efforts of the student to study a subject, practice, obtain feedback, analyze, and solve problems [15]. Similarly, Czerkawski and Lyman [16] concluded that students with high overall perceptions of social presence scored high in terms of perceived learning and perceived satisfaction with the instructor. They suggested that it is important to focus on the interaction that takes place between students and instructors. Thus, active learning and student engagement are imperative for increased student learning and ultimately retention. Students' perceptions of the overall usability of the course are likely correlated to student satisfaction and learning. In other words, the more organized and logical the course layout, the more likely students will be satisfied with their learning in the course [17]. Gray and DiLoreto [18] found that quality courses contained the following characteristics: written objectives, well-organized content, variety of opportunities for interpersonal interaction, and effective use of technology. One of the challenges of online learning relates to students feeling disconnected from their classmates and instructor. By offering a variety of topics that are relevant to current issues in the field and allowing students to connect the practical, in this case, their professional experience, to the theoretical, the course content, the learners become more invested in the course discussions and assignments, as well as their colleagues [19].

III. Research Aim and Objectives

This study expands an earlier case study done by Fuchs and Karrila [20] that sought to examine the perceived satisfaction of students in higher education concerning emergency remote teaching amid COVID-19 in Southern Thailand. Fuchs and Karrila [20] observed that most undergraduate students prefer a traditional on-site classroom arrangement, but were satisfied with the alternative ERT that was delivered fully online. Their case study highlighted that the students perceived knowledge, friendliness, and patience as the most important characteristics of their lecturer in these circumstances. This study adopts the methodological framework from Fuchs and Karrila [20] and applies it in a different geographical setting to meet the following two research objectives:

1) To examine student engagement and perceived satisfaction with remote teaching during COVID-19, among undergraduate students in Northeastern Thailand
2) To establish a baseline for future research and contribute to the body of knowledge with regards to remote teaching in Northeastern Thailand

Moreover, the research was guided by the following research question: "How do undergraduate students in Northeastern Thailand perceive emergency remote teaching during COVID-19?"

IV. Methods and Data

A. Participants

The data were collected from undergraduate students in their first- and second-year of study who were enrolled in a full-time degree program. The sample included degree programs that relate to Business Administration and Business Management studies. After screening the collected data, the following responses were discarded from further analysis: Responses from another Faculty (i.e. Faculty of Science), responses from international exchange students (responses from international degree students were included in the analysis), inconclusive/incomplete responses as well as responses from students in their final year of study (year four or beyond due to insufficient data). An overall sample of 287 responses was included in the descriptive data analysis. Based on all eligible responses, the representative socio-demographic profile in Table I summarizes the respondents' gender, year of study, age range, nationality, and preferred mode of study.

For the qualitative follow-up investigation, 14 students were recruited for unstructured interviews. The students were selected from the pool of participants (Table I) based on their availability after the quantitative data analysis was concluded. The demographic profile of the interviewed students included seven female and seven male students. Furthermore, seven students from each year of study were chosen (Year 1 and Year 2). Lastly, 12 of the students were Thai and two were foreign exchange students.

TABLE I: CHARACTERISTICS OF THE PARTICIPANTS

Characteristic	Frequency	Percentage
Gender		
Male	93	32%
Female	194	68%
Year of study		
Year 1	79	28%
Year 2	208	72%
Age range		
18 years old	7	2%
19 – 20 years old	251	88%
21 years old or above	29	10%
Nationality		
Thai	229	80%
Foreign	58	20%
Preferred mode		
Virtual classroom	72	25%
Traditional classroom	215	75%

B. Administration and Environment

The empirical data were collected in the fourth quarter of 2021 at a large higher education institution in northeastern Thailand. The data were collected in the midst of a countrywide ERT policy that was implemented and effectively replaced traditional face-to-face teaching. Convenience sampling was used to collect the data through a bilingual (Thai and English) self-administered digital questionnaire (e-survey accessed via a tablet). The students were recruited on-site to voluntarily participate in the data collection. Furthermore, the students were asked for their assistance to further distribute the survey amongst their peers.

C. Questionnaire and Interview

The questionnaire was split into three sections containing a total of 27 questions and was adapted from an earlier case study [8]. The first section sought to collect data on the participant's socio-demographic profile. The second section contained a set of ten (10) question items, and an identical set of questions was used in the third section. The participants were able to express their views on a 5-point Likert-type scale with pre-coded responses. The pre-coded responses for the second section ranged from Not Important At All 1), Not Very Important 2), Somewhat Important 3), Very Important 4), to Extremely Important 5). Similarly, the third section had pre-coded Likert-type responses for Not At All Satisfied 1), Not Very Satisfied 2), Somewhat Satisfied 3), Very Satisfied 4), and Extremely Satisfied 5). Otherwise, the items in the second and third sections were similar, to facilitate comparing the perceived importance and perceived performance by each item (Table II). The structure and content of the administered questionnaire were examined for validity by three university lecturers through an earlier case study [20].

TABLE II: STATEMENTS FOR THE QUANTITATIVE DATA COLLECTION

	Attribute Description
A	The teacher begins the class with a review of the previous class
B	The teacher presents the material in an interesting and engaging way
C	The teacher presents the material in an organized and coherent way
D	The teacher is knowledgeable about the content of the course
E	The teacher is friendly and patient with the students
F	The course material is well and professionally prepared
G	The course material is easy to access in the LMS
H	Students are engaged to actively participate in the discussion
I	I am learning something which I consider valuable
J	I am finding the course challenging and stimulating

Furthermore, it was tested for comprehension in a focus group discussion involving three students. These preliminary examinations yielded minor revisions in the wording to enhance the clarity of the questionnaire. For the interviews, the lead investigator conducted unstructured interviews based on the findings from the quantitative analysis to gain a more comprehensive insight into the participants' perspectives. An unstructured interview model allows one to go more in-depth on a particular topic [21] and identify traits of the participant that have an impact on their perception [22]. While unstructured interviews (or non-directive interviews) do not have a predefined catalog of questions, they tend to follow a specific theme that guides the discussion [21], [22]. Furthermore, the interviews were transcribed verbatim and the content analysis was developed from the transcribed interviews. The length of the interviews ranged from 23 minutes (shortest) to 45 minutes (longest) with an average duration of 29 minutes. The participants were students enrolled in an undergraduate degree program and voluntarily agreed to participate in the data collection for this study. It was made clear to them that their participation did not affect their academic performance or assessment.

D. Ethical Considerations

The foundation for ethical considerations is based on the principles formulated by the Norwegian National Research Ethics Committees [23]. These ethical norms include issues such as "requirements for honesty, requirements for informed consent, anonymization and storage of data, the right of access to data for participants and duty of confidentiality for all those who undertake research" [23]. The questionnaire for the quantitative data collection contained a disclaimer stating that participation is entirely voluntary, not related to their current academic assessment as well as that all responses would be recorded anonymously. Before commencing the interviews, confidentiality and data privacy were considered and guaranteed to the participants. The interview participants

were presented with the specific aim and scope of the research and verbal consent was obtained through recording their agreements before conducting the interviews [23].

E. Analysis of the Data

In the first step, the quantitative data were screened and prepared (exclusion criteria are mentioned in section 3.A). After completing the data preparation phase, the questionnaire data were examined using JASP (software for statistical analysis) to obtain an average value (Mean), Standard Deviation (SD), Minimum value (Min), Maximum value (Max), and distribution of data for each item. The mean values for perceived importance and perceived performance were compared for further analysis (Table III). In the second step, it was decided to conduct unstructured interviews to gather more data on specific empirical findings from the quantitative data collection. The interviews served as a supplement to the quantitative data and helped to provide context and meaning when assessing the student perceptions about ERT. The findings that required a qualitative follow-up inquiry are discussed in the sections below. The content analysis was developed from the transcribed (verbatim) interviews by highlighting relevant keywords, mapping these keywords to codes (Fig. 1), and later establishing themes (Table IV). The interviews allowed the researcher to gain a more comprehensive insight into the students' perceptions of (emergency) remote teaching. The data analysis and findings are discussed and interpreted in later sections of this paper.

Fig. 1. Coding map based on the interview transcripts.

V. Results and Discussion

The results are presented in two separate sections that allow for chronological analysis and presentation. The first section presents the mean values for each attribute and allows for a comparison of the results and analysis of engagement and satisfaction with emergency remote teaching. The second section presents the qualitative findings from the unstructured interviews to provide more comprehensive insights into particular findings (lack of social interactions with peers, inability to seek academic support, and low engagement in remote study).

A. Importance-Performance Analysis (IPA)

The results are organized by attributes ranging from A to J, for importance ratings and performance ratings. For each attribute Table III shows the mean response and mode value based on the 287 eligible responses. The three highest mean ratings concerning the perceived importance of each attribute are E (4.22; the teacher is friendly and patient with the students), B (4.18; the teacher presents the material in an interesting and engaging way), and D (4.15; the teacher is knowledgeable about the content of the course). At the other extreme, the lowest-ranked attributes related to perceived importance are H (3.94; students are engaged to actively participate in the discussion) as well as A (4.01; The teacher begins the class with a review of the previous class).

On the other hand, the highest mean ratings concerning the perceived performance are A (3.91; the teacher begins the class with a review of the previous class), I (3.89; I am learning something which I consider valuable) and J (3.88; I am finding the course challenging and stimulating). At the opposing end of the lowest mean ratings are F (3.61; the course material is well and professionally prepared) and G (3.73; the course material is easy to access in the LMS). Overall, the responses related to perceived importance ranged from 3.94 to 4.22, whereas the responses related to perceived performance ranged from 3.61 to 3.91.

TABLE III: Comparison of Importance- and Performance Ratings Based on Empirical Data

No.	Importance rating[1]		Performance rating[2]		Difference in mean ratings[3]
	Mean ($\bar{x}$)	Mode	Mean ($\bar{x}$)	Mode	
A	4.01	5.00	3.91	5.00	-0.10
B	4.18	5.00	3.80	4.00	-0.38
C	4.07	5.00	3.79	4.00	-0.27
D	4.15	5.00	3.78	4.00	-0.36
E	4.22	5.00	3.79	4.00	-0.43
F	4.14	5.00	3.61	4.00	-0.53
G	4.14	5.00	3.73	4.00	-0.40
H	3.94	5.00	3.81	4.00	-0.13
I	4.06	5.00	3.89	4.00	-0.17
J	4.02	5.00	3.88	4.00	-0.14

[1] Ratings were obtained from a Likert-type five points scale ranging from lowest rating to highest rating, i.e. Not Important At All (1), Not Very Important (2), Somewhat Important (3), Very Important (4), and Extremely Important (5)
[2] Ratings were obtained from a Likert-type five points scale ranging from lowest rating to highest rating, i.e. Not At All Satisfied (1), Not Very Satisfied (2), Somewhat Satisfied (3), Very Satisfied (4), and Extremely Satisfied (5)
[3] The differences were calculated between the means: [Performance] – [Importance] = [Difference]

In the comparison (Table III) the mean values of all ten attributes are compared between the importance ratings and the performance ratings given by the surveyed students. Furthermore, the most common response is displayed next to the mean value ("Mode" in Table III). About the most common value based on the 287 responses, it can be noted that all the items had 5 (Extremely Important) as the most common response for perceived importance. Contrary to this, nine out of ten of the performance-related attributes rated with 4 (Very Satisfied) as the most common response in the 287 responses that were included in the analysis. Another

noteworthy trend emerges from comparing mean values. Across all ten attributes, the importance rating was always higher than the corresponding performance rating of the same attribute.

The largest difference between importance and performance was recorded for F (-0.53) that relates to "the course material is well and professionally prepared". Next to that, the second largest difference was for E (-0.43) related to "the teacher is friendly and patient with the students". At the other extreme, the smallest difference was noted for A and H (-0.10 and -0.13 respectively). Therefore, the items "the teacher begins the class with a review of the previous class" (Item A) and "students are engaged to actively participate in the discussion" (Item H) almost met the students' expectations based on comparing their ratings of importance and performance. Moreover, there are two further observations that are noteworthy. Firstly, the students have relatively high expectations concerning (emergency) remote teaching, as indicated by the high means of ratings (range: 3.94 – 4.22) and their modes. And secondly, none of the surveyed items (performance ratings) was able to outperform the students' expectation (importance ratings), therefore, leaving the students unsatisfied by definition. Nevertheless, it should be mentioned that the gap between importance and performance was usually between .10 and .53 points on a five-point Likert-type scale.

B. *Empirical Findings Based on Unstructured Interviews*

Student engagement can be a challenging theme in any classroom environment. To put specific aspects and results of the quantitative questionnaire into better perspective, a follow-up inquiry with 14 students was conducted. The reason for not establishing a framework for the interviews allowed the researcher to flexibly investigate specific topics that emerged during the discussions, which is one of the contributions to the study and a suitable approach [24]. The unstructured interviews revealed the following concerns: lack of institutional socialization with other students, lack of peer-to-peer socialization, and feeling of helplessness when in need of academic support as well as technological difficulties to navigate the classroom applications. The findings with supportive statements from the participants are presented in the following paragraphs as well as an excerpt of the coded findings based on the content analysis in tabular format (Table IV).

TABLE IV: EXCERPT OF CODED FINDINGS BASED ON CONTENT ANALYSIS

Codes	Themes
a. lack of academic support	
b. unavailability of teacher	1. Academic Support
c. I am unsure whom to ask	
d. I miss my friends	
e. talking to teachers/students	2. Lack of Socialization
f. I haven't left the dormitory	

A study conducted by Rands and Gansemer-Topf [25] suggests that institutional socialization with other students as well as peer socialization amongst students are positively related to overall satisfaction with the teaching services provided. Hence a claim made by multiple participants in the interviews that they are lacking socialization with their peers can indeed be seen as a possible cause for deteriorated satisfaction and as an obstacle to good academic performance. In particular, the students that were interviewed and subjected to emergency remote teaching did not apply for admission to an online degree program (i.e., they never had the intention to study remotely). Furthermore, they had none to limited prior experience with distance learning, therefore, the sudden shift could have been a more severe burden compared to those students with prior experience.

"*I miss to go to university and meet my friends. Some of them, I haven't seen in a very long time already*". (P5)

Another reoccurring theme that was reported by several of the fourteen interviewed students was the ability to stay focused when studying from home (remotely). The students agree that they feel more engaged when studying in a physical classroom on-site. The lower engagement rating for virtual classrooms could derive from the sudden nature of ERT, as mentioned by Hodges *et al.* [4]. Educators found themselves in a situation of needing to teach their entire syllabus online with little preparation time and often no prior experience with online teaching [6].

"*When I have to study at home, it is easy to get bored in front of the screen. I often decide to play with my phone or chat with my friends and don't pay attention to the teacher. When I am in a real class, I pay more attention*". (P3)

To create meaningful classroom experiences, every student must have adequate access to the course content, the knowledge, the tools, the lecturer, and the classroom community as a whole. There is no guarantee that students are going to have a pleasant experience with the traditional class despite the utmost effort of the academic staff. However, there are strategic things that can be done to level the playing field and provide access to students as much as possible. Based on the existing literature and putting the empirical findings into perspective, it appears that academics are not prepared for the same magnitude of effort as with their traditional teaching. An exemplary finding is a statement from a participant who felt abandoned when needing academic support from the teaching or support staff.

"*When I need help or support, I often don't know how to contact. When I am at university, I can just walk to the office after class. It's easier and more convenient. When I have problems during study at home, I often don't ask*". (P8)

Similarly, it should not be assumed that every student has the same digital literacy, as supported by Kaeophanuek, Na-Songkhla, and Nilsook [26] who state in a similar case study that "most of the participants reported learning online during the crisis has broadened the digital inequality and threatened their digital privacy which influenced negatively student engagement". This has also been a recurring theme with the majority of the fourteen interview participants who

noted that they felt more proficient in using the technology compared to the beginning of the pandemic (i.e. about a year and a half before the interview). Nevertheless, they admitted that they often feel insecure to use the technology.

There are a few noteworthy findings from this study that outline where the educators' emphasis could be placed in a sudden and disruptive move toward virtual teaching. For example, the study revealed that students in their third year appear less reluctant towards remote teaching than their younger peers. If only a limited quota of the students would be allowed to return to campus, the emphasis could be placed on allowing the younger students to return first. Another noteworthy finding from this study was that foreign students are generally more open to remote teaching than their Thai peers. Even though no evidence in the literature currently offers a sufficient explanation of this phenomenon, it could help educators when allocating and prioritizing resources during hybrid teaching (while a limited number of students can be accommodated back on campus).

VI. Conclusion and Future Works

The primary objective of this study was to examine student engagement and perceived satisfaction among undergraduate students in Northeastern Thailand. Everyone involved in the temporary but sudden shift to virtual learning must recognize that these crises cause disturbances to students, staff, and educators alike. While the coronavirus pandemic should hopefully be a distant memory soon, we should not just return to pre-virus teaching and learning approaches and overlook the significant lessons learned through ERT. Moreover, the limitations of this study offer opportunities for future research; while the author tried to mitigate possible limitations as far as possible, it is necessary to point out that the settings in which the results were collected are geographically limited to the northeastern region of Thailand and not generalizable to a larger population. Furthermore, the demographic profiling of students offers opportunities for future research to quantitatively validate the results and possibly generalize the findings to a larger population.

Conflict of Interest

The author declares no conflict of interest.

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B. Data Availability

The data that support the findings of this study are available from the corresponding author upon reasonable request.

C. Recognition

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Kevin Fuchs is a lecturer in the Faculty of Hospitality and Tourism at the Prince of Songkla University in Phuket, Thailand. He graduated with a M.Sc. in computer science from Linnaeus University, Sweden and has developed a keen research interest in topics that revolve around technology-enhanced learning (TEL). He has published articles in several international journals and presented his work at international conferences.