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# Perspectives of teachers and students on the impact of online classrooms during the COVID-19 pandemic

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During the COVID-19 pandemic, transformation from face-to-face classrooms to online classrooms took place in higher education. This study aimed to evaluate the impact of teaching and learning of this change on students' and teachers' perspectives. The study also investigated the various impact factors that hindered online teaching and learning during the COVID-19 lockdown period. In total, 383 students and 83 teachers at Walailak University, Thailand, who had at least 3 months of experience with online learning and teaching were asked to complete questionnaires that asked about their perspectives with respect to their online classroom experience. The student questionnaire asked about the quality of teachers, quality of communication, the student's work, student's concentration, and satisfaction with the online classroom experience. The teacher questionnaire asked about the teacher's perspective with respect to how the restrictions of online teaching affected teachers, students, and courses. The relations between students and teachers were analyzed by a chi-square test using the SPSS program version 25.0, with defined  $p$ -values as  $<0.05$  and  $<0.10$  of student and teacher perspectives, respectively. Relations were found between student GPA and student work and student concentration in online classrooms. The teachers' perspective with respect to online teaching was found to be related to the restrictions that online teaching placed on teachers, students, and course management. The results of the study show teachers' awareness about restrictions that online teaching placed on teachers, students, and course management. Institutions should prioritize and practice using educational technologies at scale, install ICT infrastructure, and engage in lifelong learning.

## KEYWORDS

student perspectives, teacher perspectives, online classroom, student satisfaction, online teaching restrictions

## 1 Introduction

The initial outbreak of the coronavirus 2019 (COVID-19) pandemic was first identified in December 2019 in Wuhan, China, and was initially called the "Wuhan virus" (Druss, 2020; Fiorillo and Gorwood, 2020). It spread rapidly, and The World Health Organization (WHO) on 11 March 2020, officially announced that COVID-19 had reached pandemic status after it extended its reach to 114 countries in 3 months and had infected more than 118,000 people globally. By September 2022, approximately 30,086,319 total cases, 21,833,645 total recoveries,

and 6.5 million total deaths had been recorded [World Health Organization (WHO), 2020]. The COVID-19 pandemic had no boundaries, the effects were significant, and the virus was fast-moving. Within just a few months of the initial outbreak, lockdowns, quarantines, and stay-at-home strategies were declared by governments in many countries to 'flatten the curve' and control the transmission of the disease (Onyema et al., 2020). It drastically changed lifestyles across the world, with millions of people being forced to observe self-isolation, working and studying from home. COVID-19 impacted not only the overall economy and our daily lives but also affected emotional, mental, and physical health (Haleem et al., 2020; Xiang et al., 2020). Moreover, disruptions to the celebration of cultural and religious events contributed to increased stress among the global population (Evans, 2020; Tadesse and Mu-luye, 2020).

Among the countries of South-East Asia, on January 17, 2020, Thailand became the first to report a case of COVID-19 infection outside China. The highest number of confirmed cases in the 'first wave' in Thailand was recorded on 22 March 2020. At that time, there were 188 new positive tests per day. The second wave was far more widespread and more complex than the first wave. There were more than 20,000 new cases within 3 months (between December 2020 and February 2021). The Thailand government announced a nationwide curfew in response to the spreading pandemic and required that people wear face masks in public, practice social distancing, and remain inside their habitats from 10 p.m. to 4 a.m. The immediate impact of these closures was the discontinuation of face-to-face teaching, which threatened the potential loss of one or more academic years (Evans, 2020).

The transition from in-person face-to-face teaching to online teaching happened at almost all educational institutions (Kozimor, 2020; Moore et al., 2021). This was often challenging, especially at the universities, which have diverse courses and many styles of classes, such as lectures, laboratory classes, and clinical practice classes (Sun et al., 2020). The sudden shift to online classrooms had several effects on both teaching and learning preparation (Basilaia and Kavadze, 2020).

Although technologies were available to allow students to continue their studies via online delivery of teaching, it soon became apparent that the experience was far different from that of face-to-face classrooms. This was often particularly difficult for educators, students, and parents outside of major urban population centers, where the accessibility, availability, and use of technology in education were not widespread (Onyema et al., 2020). The statistics showed households with computers in Thailand were only 21%, which was 49% lower than the world average, which means online learning may not be a practically suitable for Thailand (Pal et al., 2022). In terms of parents, they partially lost their confined working time to support their children and a big change of teaching patterns to online classes, which increased multiple workloads for them (Kelly et al., 2023). Some families had to face financial constraints and redundancy as a side effect of business disruption; it aggravated mental health effects such as anxiety, stress, or even suicide rate, which put much pressure on the families (Beach et al., 2021; Trueblood et al., 2023). Most of the students felt worried about their vague future due to the uncertainties of their studies, examinations, and further education (Yasmin et al., 2020). Clearly, there were potential issues with respect to the quality of teaching, learning, and academic achievement, particularly for students or classes affected by learning difficulties or those that

required more physical attention or guidance from the teachers (Mustafa, 2020).

Teachers were another group of people who were directly impacted by institutions' closure and a sudden shift of teaching patterns from traditional classrooms to online classrooms. The number of teachers who struggled was the same as that of the students due to their unpreparedness in terms of availability of digital devices and digital literacy (González et al., 2023). A lack of explicit guidelines from the institutions and a need for creativeness and boldness in front of a screen, monitor, or camera are also some of the important issues teachers faced, affecting teachers' psychological stress and a load burden. Another problem was the teachers had to adapt lessons literally overnight, and students faced new problems, such as being unable to avoid the noises and distractions that emanated inside the home and externally from neighbors or the neighborhoods (O'Hagan, 2020). In the traditional pre-COVID face-to-face classroom, teachers typically used applications such as Microsoft PowerPoint or Keynote to present information via a projector in the classroom. They were not familiar with supported technologies for online teaching such as Zoom, Google Meet, Webex Meeting (Pokhrel and Chhetri, 2021). The teachers and students lacked both familiarity with and readiness for online distance teaching. This impacted the physical and psychological health of the teachers and students.

Previous studies have investigated the effect of the COVID-19 pandemic on teaching and learning from several perspectives (Amir et al., 2020; Bestiantono et al., 2020; Maatuk et al., 2022). However, there was limited data about the impact on multiple domains of students' and teachers' perspectives until this study produced empirical data on multiple domains regarding the perspectives of students and teachers on the switch to the online classroom during by COVID-19. The main objective of the study was to evaluate the impact of teaching and learning changes from face-to-face to online approaches during the COVID-19 pandemic on student and teacher perspectives with respect to online classes. The study also investigated the various impact factors that hindered online teaching and learning during the COVID-19 lockdown period.

## 2 Materials and methods

### 2.1 The participants

The students were undergraduate students at Walailak University, Thailand, who had at least 3 months of online study experience. Teachers in the study were selected from the same university and had at least 3 months of online teaching experience. Exclusion criteria included anyone who needed to withdraw from the study. The sample size was calculated by the Taro Yamane formula shown below:

$$n = \frac{N}{1 + N(e)^2}$$

where  $n$  = sample size;  $N$  = total population;  $e$  = the error of 5%.

Based on the previous study used the Taro Yamane formula (Shonubi et al., 2021), a 95% confidence level and precision level at 5% for students and 10% for teachers. As a result, 383 students and 83 teachers were required in the study. The study was approved by the

Research Ethics Committee of Walailak University (WUEC-21-261-01) and was conducted in accordance with the Declaration of Helsinki.

## 2.2 The questionnaires

This study comprised a cross-sectional survey in which data were collected by using student and teacher questionnaires, all of which were generated and developed by the researcher based on previous studies (Bangert, 2004). Three experts who passed at least the Fellow level of UKPSF and were involved in online teaching during the pandemic assessed content validity. The three experts assessed the accuracy of the questionnaires by rating each item with 0 for disagree and 1 for agree. All comments for each disagree item were also re-analyzed and adjusted based on suggestions suitable for the study. After that, the questionnaires were tested for content validity and presented the mean Cohen kappa value as 0.71 and 0.69 for the student and the teacher questionnaires, respectively.

The student questionnaire consisted of five domains, while the teacher questionnaire consisted of three domains. The student questionnaire gathered information about the student's perspective on the quality of teachers, quality of communication, the student's work, student's concentration, and satisfaction with the online classroom. The student questionnaires were distributed to 466 students and received 383 completed forms. The students were recruited from all years. The teacher questionnaire gathered information about the teacher's perspective with respect to how the restrictions of online teaching affected teachers, students, and courses. The teacher questionnaires were distributed to 102 teachers and 83 completed forms were received from different faculty at Walailak University. Due to the lockdown situation, the questionnaires were sent and collected via an online survey platform using Google Forms. In the student and teacher questionnaires, in order to define the characteristics of the sample, demographic data such as gender, cultural and ethnic background, course, and year of studying/teaching. The demographic data were collected to acquire a consolidated and comprehensive description of the characteristics of the participants. The result of the analysis is the concepts or the explained characteristics of students and teachers.

The grade point average (GPA) of all students was collected via the grade-recording system on the website of the university. Students can access formal grade information themselves although it was from a prior grade semester.

Each question in the student questionnaire was divided into five domains. The first domain is the quality of online teaching. This set of questions aimed to gather information and remarks from students about teaching in the online classroom, such as whether the teacher communicated effectively, was concerned about students' learning, or was enthusiastic about online teaching. The second domain is the quality of communication via online platforms. This domain focused on any communication problems which occurred in the online classroom, we used questions such as the communication created by online platform helped them to learn easily, the communication device or tool was easy to use by students, etc. The third domain is student's work. This domain focused on the quality of student's work and encouraging self-learning with the online platform. We used questions as follows: Have the online classes sharpened my analytical skills, has the online platform encouraged me to work in any comfortable place, and have online classes helped me develop the ability to plan my own work?. The fourth domain is the student's

concentration. This domain focused on how long students concentrated in the online classroom and any factors that distracted the concentration of students during online classes. The last domain is student's satisfaction. This domain focused on student's opinions on online learning, we used questions such as were the online classes valuable, whether taking the online classes increased my interest in education and lifelong learning, or whether using online platform technologies is a great learning experience that I can apply in future jobs.

## 2.3 Data assessment

Assessment data were collected via the student and teacher questionnaires during the COVID-19 pandemic (Nov. 2021 to Apr. 2022). With respect to the factors that restrict the ability to use or participate fully in an online classroom, the students and teachers were asked to rate each of the questions on a 5-point Likert scale, ranging from "no influence" to "major influence."

## 2.4 Statistical analysis

All data were recorded and analyzed using the statistical software SPSS version 25.0, which was used in previous studies during the COVID-19 pandemic (Hussen and Alemu, 2021; Marzo et al., 2022). The demographic and characteristics data were analyzed by descriptive statistics and presented in mean  $\pm$  SD. GPA was identified as the independent factor, and relationships were tested between the independent and the dependent factors: student's perspectives on the quality of online teaching, quality of communication, student's work, concentration during learning, and satisfaction with online learning. At the same time, relationships between teachers' perspectives regarding online teaching restrictions on teachers, students, and courses were analyzed by a chi-square test.

Based on the aim of this study to determine the level of perspective of the students and the teachers, we classified the level of perspective of students and teachers into three levels; high, middle, and low levels of perspective to analyze variables in order to obtain accurate results. Data gathered from student and teacher questionnaires were converted from the 5-point scale to three levels following the concept of Best (1981) and a previous study used this concept (Charles and Kumar, 2018), for using chi-square to test relationships. The conversion is presented in the following formula:

$$\frac{\text{Maximum score} - \text{Minimum score}}{\text{Number of levels}} = \frac{5 - 1}{3} = 1.33$$

Based on this formula, the low level had a range of 1–2.33; the middle level had a range of 2.34–3.67; and the high level had a range of 3.68–5.

## 3 Results

### 3.1 Student perspectives

In total, 383 students drawn from a number of different faculties completely answered all questions in the questionnaire and 155 were

first-year students; 97 were second-year students; 57 were third-year students, and 74 were fourth-year students. The duration of the online study differed based on the number of years each student had been in college. Most of the first year and fourth year students spent 3 to 6 months in online classes. On the other hand, most of the second-year and third-year students had studied in online classes for 6 to 12 months. Most of the participants were health sciences students, with the largest number being from the Faculty of Allied Health Sciences, which comprises the medical technology department and physical therapy department, both of which had both lecture classes and laboratory classes in the first to fourth years, and clinical practice in the hospital during the fourth year. It was found that students had high GPAs in all four-year levels (Table 1).

### 3.1.1 The relationships between student perspectives on the quality of online teaching and GPA in each year of college

There was no significant relation found between student perspectives on the quality of online teaching with student's GPA in the first, second, third, and fourth years of college ( $p$ -value = 0.183,

0.807, 0.104, and 0.501, respectively) as shown in Table 2. However, most of the students in each year of college had a high-level perspective on the quality of teachers taught via online classrooms.

### 3.1.2 The relationships between student perspectives on quality of communication via online platforms and GPA in each year of college

There was no significant relation between student perspectives on quality of communication via online platforms with student GPA in the first, second, third, and fourth years of college ( $p$ -value = 0.083, 0.848, 0.476, and 0.323, respectively) as shown in Table 2. However, most of the students in each year of college had a high-level perspective on the quality of communication via online platforms.

### 3.1.3 The relationships between student perspectives on the quality of student work and GPA in each year of college

There was a significant relation between student perspectives on the quality of student work and student GPA among the third-year students ( $p$ -value = 0.007). Most of the third-year college students had a high-level

TABLE 1 Demographics and characteristics of students.

Demographic and Characteristics	Amount (%)			
	1st year	2nd year	3rd year	4th year
<b>Sex</b>				
Male	29 (18.7)	10 (10.3)	9 (15.8)	9 (12.2)
Female	126 (81.3)	87 (89.7)	48 (48.2)	65 (87.8)
<b>Duration of online learning</b>				
3–6 months	69 (44.5)	29 (29.9)	20 (35.1)	31 (41.9)
7–12 months	59 (38.1)	65 (67.0)	31 (54.4)	21 (28.4)
More than 1 year	27 (17.4)	3 (3.1)	6 (10.5)	22 (29.7)
<b>Departments</b>				
Faculty of Business Administration	7 (4.5)	5 (5.2)	6 (10.5)	1 (1.4)
Faculty of Nursing	9 (5.8)	8 (8.2)	4 (7.0)	0
Faculty of Law	5 (3.2)	3 (3.1)	2 (3.5)	0
Faculty of Science	9 (5.8)	1 (1.0)	0	0
Faculty of Engineering	9 (5.8)	8 (8.2)	2 (3.5)	0
Faculty of Arts	13 (8.4)	1 (1.0)	1 (1.8)	5 (6.8)
Faculty of Architecture	19 (12.3)	0	1 (1.8)	1 (1.4)
Faculty of Allied Health Science	31 (20.0)	56 (57.7)	32 (56.1)	63 (85.1)
Faculty of Veterinary Medicine	0	0	3 (5.3)	0
Faculty of Public Health	10 (6.5)	8 (8.2)	4 (7.4)	0
Faculty of Science in Information Technology	9 (5.8)	5 (5.2)	1 (1.8)	3 (4.2)
Faculty of Agro-Industry	17 (11.0)	0	1 (1.8)	0
Faculty of Pharmaceutical science	17 (11.0)	2 (2.1)	0	1 (1.4)
<b>GPA</b>				
Low	2 (1.3)	0	1 (1.8)	0
Medium	18 (11.6)	7 (7.2)	5 (8.8)	24 (32.4)
High	135 (87.1)	90 (92.8)	51 (89.5)	50 (67.6)
Average	2.86	2.93	2.88	2.68

perspective on how the quality of their work affected their GPA. However, there was no significant relation between student perspectives on the quality of student work and student GPA in the first-, second- or fourth-year students ( $p$ -value=0.427, 0.527, and 0.357, respectively) as shown in Table 2. In the same way, most of the first-, second- or fourth-year college students had a high-level perspective on the relation between the quality of student work and student GPA.

### 3.1.4 The relationships between student perspectives on concentration during online studying and GPA in each year of college

There was a significant relation between student perspectives on concentration on studying and student GPA in the first and third college years ( $p$ -value=0.029 and 0.001, respectively). Most of the students in each year of college had a high-level perspective on

TABLE 2 Relationships between students' perspectives on each domain with GPA.

Outcomes	College year		GPA			Sig.
			Low amount (%)	Middle amount (%)	High amount (%)	
Quality of teachers	1st year	Low	0	0	2 (1.3)	0.183
		Middle	0	1 (0.6)	17 (11.0)	
		High	3 (1.9)	40 (25.8)	92 (59.4)	
	2nd year	Low	0	0	0	0.807
		Middle	0	2 (2.1)	5 (5.2)	
		High	0	22 (22.6)	68 (70.1)	
	3rd year	Low	0	0	1 (1.8)	0.104
		Middle	0	3 (5.3)	2 (3.5)	
		High	0	10 (17.5)	41 (71.9)	
	4th year	Low	0	0	0	0.501
		Middle	0	14 (18.9)	10 (13.5)	
		High	0	25 (23.8)	25 (33.8)	
Quality of communication via online platform	1st year	Low	0	0	2 (1.3)	0.083
		Middle	3 (1.9)	5 (3.2)	10 (6.5)	
		High	6 (3.9)	67 (43.2)	62 (40)	
	2nd year	Low	0	0	0	0.848
		Middle	1 (1.0)	4 (4.1)	2 (2.1)	
		High	8 (8.2)	49 (50.5)	33 (34.0)	
	3rd year	Low	0	1 (1.8)	0	0.476
		Middle	0	1 (1.8)	4 (7.0)	
		High	2 (3.5)	27 (47.4)	22 (38.6)	
	4th year	Low	0	0	0	0.323
		Middle	4 (5.4)	15 (20.3)	5 (6.8)	
		High	3 (4.1)	37 (50.0)	10 (13.5)	
Student's work	1st year	Low	0	1 (0.6)	1 (0.6)	0.421
		Middle	5 (3.2)	5 (3.2)	8 (5.2)	
		High	16 (10.3)	51 (32.9)	68 (43.9)	
	2nd year	Low	0	0	0	0.527
		Middle	0	4 (4.4)	3 (3.1)	
		High	11 (11.3)	53 (54.6)	26 (26.8)	
	3rd year	Low	1 (1.8)	0	0	0.007*
		Middle	0	2 (3.5)	3 (5.3)	
		High	3 (5.3)	27 (47.4)	21 (36.8)	
	4th year	Low	0	0	0	0.357
		Middle	0	4 (4.4)	3 (3.1)	
		High	11 (11.3)	53 (54.6)	26 (26.8)	

(Continued)

TABLE 2 (Continued)

Outcomes	College year		GPA			Sig.
			Low amount (%)	Middle amount (%)	High amount (%)	
Concentration on study	1st year	Low	0	0	2 (1.3)	0.029*
		Middle	4 (2.6)	7 (4.5)	7 (4.5)	
		High	6 (3.9)	68 (43.9)	61 (39.4)	
	2nd year	Low	0	0	0	0.483
		Middle	0	6 (6.2)	1 (1.0)	
		High	8 (8.2)	58 (59.8)	24 (24.7)	
	3rd year	Low	1 (1.8)	0	0	0.001*
		Middle	0	2 (3.5)	3 (5.3)	
		High	2 (3.5)	32 (56.1)	17 (29.8)	
	4th year	Low	0	0	0	0.406
		Middle	2 (2.7)	15 (20.3)	7 (9.5)	
		High	6 (8.1)	36 (48.6)	8 (10.8)	
Satisfaction of online studying	1st year	Low	0	0	2 (1.3)	0.516
		Middle	3 (1.9)	6 (3.9)	9 (5.8)	
		High	12 (7.7)	56 (36.1)	67 (43.2)	
	2nd year	Low	0	0	0	0.383
		Middle	0	6 (6.2)	1 (1.0)	
		High	13 (13.4)	55 (56.7)	22 (22.6)	
	3rd year	Low	1 (1.8)	0	0	0.101
		Middle	1 (1.8)	1 (1.8)	3 (5.3)	
		High	7 (12.3)	28 (49.1)	16 (28.0)	
	4th year	Low	0	0	0	0.909
		Middle	4 (5.4)	17 (20.3)	3 (4.1)	
		High	10 (13.5)	35 (40.3)	5 (6.8)	

concentration on studying during the online classroom. However, there was no significant relation between student perspectives on concentration on studying and student GPA among the second and 4th-year students ( $p$ -value = 0.483 and 0.406, respectively) as shown in Table 2.

### 3.1.5 The relationships between student perspectives on satisfaction with online studying and GPA in each year of college

There was no significant relation between student perspectives on satisfaction with online studying and student GPA in the first, second, third, and fourth years of college ( $p$ -value = 0.516, 0.383, 0.101, and 0.909, respectively). However, most of the students in each year of college had a high-level perspective on satisfaction in online classrooms.

## 3.2 Teacher perspectives

In total, 83 teachers drawn from different faculties completely answered all questions in the questionnaire. Of the 83 teachers, 33 were male (39.8%) and 50 were female (60.2%). With respect to age, 36 teachers were in the range of 31–40 years, representing the largest age group (43.4%). There were 26 teachers in the range of 41–50 years

(31.3%), while 13 were less than 30 years old (15.7%), and 8 were more than 50 years old (9.6%). Most of the teachers were from the Faculty of Allied Health Sciences, which consisted of the medical technology department and physical therapy department, both of which had lecture and laboratory classes. With respect to teaching experience, the results showed most of the teachers had taught in onsite classrooms for more than 10 years and had engaged in online teaching for more than 1 year as shown in Table 3.

### 3.2.1 The relationships between teacher perspectives on online teaching with restrictions on teacher teaching

There were significant relations between teacher perspectives on online teaching and restrictions on teacher teaching ( $p$ -value = 0.004). When restrictions were considered, most of the teachers had a middle-level perspective on restrictions of online teaching, which related to the teaching performance of teachers (Table 4).

### 3.2.2 The relationships between teacher perspectives on online teaching with restrictions on student learning

There were significant relations between teacher perspectives on online teaching and restrictions on student learning

TABLE 3 Demographics and characteristics of teachers.

Demographic and characteristics	Amount (%)
<b>Gender</b>	
Male	33 (39.8)
Female	50 (60.2)
<b>Age</b>	
Less than 30 years old	13 (15.7)
31–40 years old	36 (43.4)
41–50 years old	26 (31.3)
More than 50 years old	8 (9.6)
<b>Academic title</b>	
Lecturer	50 (60.2)
Assistant professor	24 (28.9)
Associate professor	9 (10.8)
Professor	0
<b>Departments</b>	
Faculty of Business Administration	2 (2.4)
Faculty of Nursing	5 (6.0)
Faculty of Law	8 (9.6)
Faculty of Science	2 (2.4)
Faculty of Engineering	1 (1.2)
Faculty of Arts	4 (4.8)
Faculty of Architecture	5 (6.0)
Faculty of Allied Health Science	27 (32.5)
Faculty of Veterinary Medicine	3 (3.6)
Faculty of Public Health	9 (10.8)
Faculty of Science in Information Technology	7 (8.4)
Faculty of Agro-Industry	3 (3.6)
Faculty of Pharmaceutical Science	4 (4.8)
Faculty of Medicine	3 (3.6)
<b>Experience of teaching</b>	
Less than 1 year	6 (7.2)
2–5 years	30 (36.1)
6–10 years	13 (15.7)
More than 10 years	34 (41.0)
<b>Experience in online teaching</b>	
Less than 1 month	2 (2.4)
1–6 months	5 (6.0)
6–12 months	14 (16.9)
More than 1 year	62 (74.7)

( $p$ -value = 0.046). When restrictions were considered, most of the teachers had a middle-level perspective on restrictions of online teaching, which related to understanding the performance of students (Table 4).

### 3.2.3 The relationships between teacher perspectives on online teaching with restrictions on course design

There were significant relations between teacher perspectives on online teaching and restrictions on course design ( $p$ -value = 0.029). When restrictions were considered, most of the teachers had a middle-level perspective on restrictions of online teaching, which related to course design.

## 4 Discussion

This study attempted to examine the relationships between student perspectives on studying in online classrooms, and teacher perspectives on themselves, students, and courses with respect to restrictions during online teaching.

### 4.1 Student perspectives

There were evident effects during the COVID-19 pandemic on students' performance, and their grades were negatively affected by the pandemic, considering that the academic calendar was brusquely disturbed by the sudden closure of institutions (Niranjan, 2020; Sahu, 2020; Tiruneh, 2020). Even though some of the students were not familiar with technologies, they tried to adapt to the unexpected circumstances by updating themselves (Pillai et al., 2021). The results of the study show relationships between student perspectives on their GPA as a result of studying in online classrooms. In particular, we found that student concentration and work were related to student GPA as described in each domain below.

#### 4.1.1 On quality of teaching

The rapid transformation from face-to-face teaching to online teaching during the COVID-19 pandemic was very challenging to students at Walailak University. That some students had to live in dormitories at the university was recorded from students' dormitory bookings following the implementation of lockdowns. While many students were able to live at home in urban or rural areas, some of these homes lacked necessary supporting equipment and stable internet connectivity, summarizing the problems faced by these students. Although the results show no relation between the quality of online teaching and student GPA, most of the students in each year of college had a high-level perspective on the quality of teaching via online classrooms. The teachers were forced to change traditional teaching to online teaching, and they tried to explain content, fairness, and correctness and create a positive atmosphere during online classes. They gave after class-hours to discussion about the contents whenever students needed (Golubovic-Ilic et al., 2023). On the other hand, the teachers were not satisfied with online teaching, both due to technical problems (Fauzi and Sastra Khusuma, 2020) and the inability to plan assessment types to fit the online platform. In addition, it was difficult to monitor how students were tracking courses and to ensure the students were not cheating during online examinations (Joshi et al., 2021). Consequently, as multiple tasks were handled by the teachers, with an obvious lack of interaction with students, a causal connection was evident with their level of motivation to learn

TABLE 4 Relationships between teachers' perspectives on online teaching with restrictions on teachers, students, and courses.

Outcomes		Teachers perspectives on online teaching			Sig
		Low amount (%)	Middle amount (%)	High amount (%)	
Restriction of online teaching effect on teachers	Low	0	0	0	0.004*
	Middle	0	43 (51.8)	30 (36.1)	
	High	0	1 (1.2)	9 (10.8)	
Restriction of online teaching on effect students	Low	0	8 (9.6)	3 (3.6)	0.046*
	Middle	0	34 (41.0)	28 (33.7)	
	High	0	2 (2.4)	8 (9.6)	
Restriction of online teaching effect on courses	Low	0	0	0	0.029*
	Middle	0	39 (47.0)	27 (32.5)	
	High	0	5 (6.0)	12 (14.5)	

(Novaković et al., 2022). Moreover, the students faced challenges in laboratory-based study; particularly in the necessity to ask their family members to be simulated patients for clinical skill practicing.

#### 4.1.2 On quality of communication

The results showed no relation between quality of communication via the online platform and student GPA. Communication during online classroom study was important because the students needed to ask questions or clarify information with teachers or express their opinions in the classroom. However, several communication problems arose during online learning. For example, some students had no microphone, or their equipment was faulty during online classes (Sharma, 2020; Joshi et al., 2021). To solve these problems, teachers and students used chat boxes in online platforms for communication, but this took more time, and created some difficulties in understanding due to the limitations of written messengers.

#### 4.1.3 On student work

A significant relation between quality of student work and student GPA was found among the third-year students. At the same time, most of the students in all years of college had a high-level perspective on the quality of student's work that was done in the online classroom or online platform. Online platforms can help students in self-study and preparation before classes and allowed groups of students to work together whenever they want. The convenient options available via online platforms, whether workplace chat, video meetings, or file storage that keep classes organized and easy to administer, supported the sharing of ideas and a variety of content, which affected or enhanced the quality of students' work (She et al., 2021; Sinval et al., 2021). However, face-to-face classrooms was more effective than online classrooms (Darkwa and Antwi, 2021), especially in laboratory classes. A minority of students lacked supportive technologies or lived in non-urban areas with difficult or limited access to the Internet. This presented obstacles to self-study of the students and their ability to complete assignments or participate in group activities with their classmates.

#### 4.1.4 On student concentration

A significant relation between student concentration during online learning and student GPA was found among first- and

third-year students. Most of the students in each year of college had a high-level perspective on concentration on studying during the online classroom. Of course, the education system had to continue the task of imparting quality education for all during the difficult times of the pandemic; however, that was often difficult. For example, during online classes, some students turned off their cameras, exacerbating the lack of interaction between teachers and students, and reducing the ability of students to concentrate throughout the classes (Joshi et al., 2021). Moreover, disruptions often occur in the home environment during online classes. For many students, the home environment did not provide an appropriate place for online study because of a lack of facilities, lack of a comfortable quiet space in which to study, and resistance to change (Novaković et al., 2022). Moreover, students had the opportunity to engage in self-study whenever they wanted because video recording was an option. Given that online classes could be recorded and reviewed later, it may have diminished students' concentration during live online classroom sessions. One simple strategy to help combat this issue is the flipped classroom, in which learning resources such as documents or pre-recorded videos are provided to students before classes. The expectation is that the students will review these resources before class, and the online session with the teacher will revolve around discussion and activities designed to develop and reinforce the learning activities that the students engaged in individually prior to the class session. This approach can help deepen both engagement and understanding through discussion (Putwain et al., 2013; Zhen et al., 2017). Flipped learning is a pedagogical approach which gives importance for the group learning space over the individual learning space; it enhances interactive learning between students where they apply concepts and engage creatively in the subject matter (Flipped Learning Network, 2014). Flipped learning can improve students' learning attention and developed self-learning and self-efficacy status (Latorre-Coscolluela et al., 2021). So, applying the flipped classroom might improve the efficacy of online learning (Divjak et al., 2022).

#### 4.1.5 On student satisfaction

Although no significant relation was found between student satisfaction with online learning and student GPA, most of the students in each year of college had a high-level perspective on



satisfaction in online classrooms. Online platforms served to aid the sharing of student ideas, whether through Zoom chats or whiteboard use in e-learning. Students with middle and high GPAs often have self-efficacy and are more likely to take on challenges and be persistent in facing multiple problems (Liu and Hallinger, 2018; Talsma et al., 2021). Students who attempt to develop an intrinsic interest in learning (Ryan and Patrick, 2001; Gustiani et al., 2022), which engages them in the use of many learning strategies and activities (Putwain et al., 2013), improve their confidence to interact with teachers or other students. In accordance with previous studies, students who are engaged in the learning process tend to review acquired knowledge, participate more fully in learning activities, and develop study strategies to assist them in achieving their academic goals (Klem and Connell, 2004), leading to more satisfaction with online classroom studies (Coetzee and Oosthuizen, 2012; El-Sayad et al., 2021). Furthermore, online classroom collaborative activities have positive effects on improving student skills such as self-awareness which are related to a student's affective and metacognitive skills, personal engagement, and classroom engagement (Almusharraf and Khahro, 2020). The students' high satisfaction levels uncovered in this study might be based on several factors, such as the level of support received from teachers (e.g., one-on-one feedback, understanding of specific circumstances), multimodal online delivery (e.g., audio, video, text, PowerPoint slides, or competition games), various ways to get teachers' guidance and follow-up (email, phone, chat box, or virtual meeting), the course level engagement by several class types (active classroom, lecture, or flipped classroom), and the teachers' efforts in using the online classroom to promote a student-centered approach and promote lifelong learning skills (Tang et al., 2020). Teaching quality, prompt feedback, and course materials were factors that enhanced student satisfaction by successful student outcomes (Gopal et al., 2021). Moreover, the COVID-19 pandemic led to a positive enhancement of students' skills with respect to the use of online platforms. Oral examination, self-study to engage in lifelong learning, or project presentations were favorably reported assessment approaches in online learning, all of which promoted skills needed for future work.

## 4.2 Teacher perspectives

Many teachers had no prior knowledge of or experience with online teaching and examination, but because of the pressure from their institution and the urgency of the pandemic situation, they were forced to teach via online platforms, which resulted in their negative attitudes toward online classes. Our results found relations between teacher perspectives toward restrictions on teachers, students, and courses during online teaching as described below.

### 4.2.1 Restriction on teachers

There was a significant relation between teacher perspectives with respect to online teaching and restrictions on teachers in online classes. Most of the teachers had a middle-level perspective on restrictions of online teaching which related to the teaching performance of teachers during online teaching. At Walailak University, online teaching was not very popular before the

COVID-19 pandemic. Most of the teachers had little or no experience with online teaching and were not well-trained to teach or conduct online examinations. Because of the government-imposed lockdowns, the teachers had no choice; they started to teach and conduct examinations from their homes or dormitories. They faced challenges such as a lack of technical infrastructure, which may have included such issues as having no laptop or desktop computer, poor or inconsistent internet connection, or a lack of assistive devices in their homes or dormitories (Nambiar, 2020). Teaching quality is the most prominent factor that affects the student's satisfaction, this means the teachers need to be efficient during online teaching (Gopal et al., 2021). However, during online classes, the teachers had to maintain their teaching more efficiently, requiring metacognitive awareness. Because the teachers had to manage multiple tasks during online teaching, such as explaining content, observing students' behavior, and using supportive tools, many found it difficult to facilitate classes for long periods of time or to control group interaction. This led to a lack of motivation to teach in online classes—a feeling that was exacerbated by having to face technical challenges like poor connectivity, poor audio and video, or power outages on their own, with little or no support from the university or any other available resource.

However, online classes were flexible and convenient, could be easily accessed, and scheduled at the teachers' convenience. In addition, classes could be taught from the comfort of the teachers' homes, which eliminated the time and expense of commuting. Online teaching also helped the teachers to upgrade their technical skills, to learn more about the use of innovative devices, and to improve their confidence (Nambiar, 2020).

### 4.2.2 Restriction on students

There was a significant relation between teacher perspectives toward online teaching and restrictions on students' learning in online classrooms. Most of the teachers had a middle-level perspective on restrictions of online teaching which related to student performance in online classrooms. Suddenly transformed from a face-to-face classroom to an online classroom, many students were surprised and unprepared to adapt their study behaviors. Some students returned to their homes, but others may have been unable to return home if they lived in rural areas with limited internet accessibility (Nambiar, 2020). There were changes to the daily routine of students such as: meeting friends, having dinner, or group exercise (Bashir et al., 2023; Watts and Pattnaik, 2023). The impact found in previous studies was anxiety, absenteeism, mental exhaustion, and distraction in the students (Poalses and Bezuidenhout, 2018). However, students often faced disruption from family members, neighbors, bad internet signals, or poor audio or video quality, all of which obstructed interaction with the teachers. The teachers felt challenges related to technological literacy and competency; yet, they also found lack of interaction between teachers and students in providing prompt feedback that can be beneficial for students to focus on the performance that enhances their learning (Gopal et al., 2021). The teachers also felt that students in online classes often made a lot of excuses and demonstrated a lack of seriousness, lack of interest, and inability to maintain involvement and attention throughout online classes. The students also often seemed to be unwilling or unable to ask clarifying questions or resolve doubts.

### 4.2.3 Restriction on courses

There was a significant relation between teacher perspectives on online teaching and restrictions on course management in online classes. Most of the teachers had a middle-level perspective on restrictions of online teaching which related to course design during the COVID-19 pandemic. Suddenly transformed from teaching in face-to-face classrooms to online classrooms, the teachers were unfamiliar with the skills and technology required for online teaching because they had little or no experience of teaching in online classrooms prior to the COVID-19 pandemic. It was difficult to teach many courses in online classrooms, whether those courses focused on numerical or practical skills, group discussion, or laboratory work requiring science equipment. Some courses taught with movement skills, such as dancing, swimming, or tennis class, were especially difficult as they required setting a camera to present the movement of teachers in such a way that allowed for effective use of the online platform (Basilaia and Kvavdze, 2020). Contrary to face-to-face teaching, language factors are mitigated, as teachers use both body language speaking for communication to respond to student's answers and questions (Nambiar, 2020). A widely experienced issue was the lack of student interest during class and apparent difficulty in understanding the material presented in online classes. Moreover, lesson plans often had to be changed or topics re-prioritized or re-sequenced due to the difficulty of teaching them, whether due to the lack of equipment, or because students may have lacked the ability or understanding needed for some manual skills being taught via the online platform. However, course design has a substantial influence on student performance in online class, which need to provide essential details like course contents, examination details, or course output in a consistent manner so beneficial for students (Almaiah and Alyoussef, 2019).

In other countries in Asia, from a previous study in India University, data were collected during the COVID-19 pandemic on students' satisfaction from students who studying the hotel management course. The results showed the most influential factors that affected students' satisfaction were the quality of teachers, students' expectations, prompt feedback, and course design, respectively (Gopal et al., 2021). Moreover, interaction between teachers and students in online learning is related to students' satisfaction and academic achievement in China (She et al., 2021). Students spent more time in online learning classes which correlated with their engagement and academic achievement (Rajabalee et al., 2020). Personalized learning via online platforms can effectively improve students' behavior, attention, motivation, academic performance, and lifelong learning which important skills for further jobs (Zhang et al., 2020). However, online pedagogy had a negative effect on student academic performance when compared with face-to-face classrooms, especially in students who had low levels of motivation and attention (Bir, 2019; Stark, 2019).

## 5 Conclusion

Rapid transformation from face-to-face to online classrooms due to the COVID-19 situation, teachers and students who were mostly affected by the changes were found demotivated and lack of preparation of knowledge and access technology infrastructures,

which are important in online classroom. Although educational institutions have since returned to face-to-face classroom teaching, the special arrangements put in place during the COVID-19 pandemic have left lasting traces. How this study is different from previous studies is that none of the studies had examined both student and teacher perspectives on online classrooms on student achievement. The essential contribution related to students of the study is the evidence provided that most of the students had a high-level perspective on the quality of teaching, quality of communication, student's work, students' concentration, and students' satisfaction in the study. After the pandemic, the expansion of online learning in universities will be maintained and promoted technology infrastructures for online classrooms which easy accessible for all teachers and students (Harasim, 2000; Sigala, 2002). In addition, students should be encouraged to access educational websites and applications without charge, and efforts should continue toward providing the opportunity for all students to access educational and maintain lifelong learning which improves students' employment. Regarding the contribution of this study concerning teachers, the results note teacher perspectives on the restrictions of teaching, student learning, and courses with online learning. It was found that the teachers must enhance their technical skills continuously and quickly in response to student's technical knowledge in classrooms. In some cases, accelerated, and schools will organize themselves to continue the use of the aspects of technology-based online learning that they have found useful. Institutions should prioritize and practice using educational technologies at scale and install and expand the use of ICT infrastructure (Chick, 2020). The results of the study can be used to improve the guidelines and build online courses as well as apply the information from the study to frame institution policies to improve online courses.

## 5.1 Limitations

The study sample was based on a university in Thailand that did not represent the whole population, thus limiting the generalizability of the findings. It is suggested that future studies expand the sample size by drawing those samples from various universities and other countries that are representative of the broader Thai and global populations.

## Data availability statement

The original contributions presented in the study are included in the article/[Supplementary material](#), further inquiries can be directed to the corresponding author.

## Ethics statement

The studies involving humans were approved by the Research Ethics Committee of Walailak University. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

## Author contributions

PR: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Visualization, Writing – original draft, Writing – review & editing. SP: Conceptualization, Methodology, Resources, Writing – review & editing.

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## Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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## Supplementary material

The Supplementary material for this article can be found online at: <https://www.frontiersin.org/articles/10.3389/feduc.2024.1335001/full#supplementary-material>

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