INFLUENCE OF SYNCHRONOUS ONLINE LEARNING ON STUDENTS' AND PARENTS' PERCEPTIONS: A CASE STUDY OF A DEMONSTRATION SCHOOL

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ABSTRACT

This study investigated the influence of synchronous online learning on students' and parents' perceptions of online learning. The research design was a mixed method approach that utilized survey questions administered to teachers, students, and parents at a demonstration school in Thailand. The findings revealed that Microsoft Teams and Zoom were the main synchronous online learning platforms. Most teachers preferred live teaching through these platforms to facilitate online learning. Students had good online learning facilities, including learning tools and internet access. Students and parents had positive attitudes towards synchronous online learning and were satisfied with the online teaching and learning. Students and parents moderately agreed that there was no difference in effectiveness between traditional, face-to-face learning and online learning. They highly agreed that traditional, face-to-face learning is still important for students. Students and parents preferred face-to face learning, which is attributed to the challenges associated with online teaching and learning environment. The use of various platforms, interactive multimedia, and applications increased the students' engagement and motivation to learn online. They expressed satisfaction with synchronous online learning, demonstrating the effectiveness of online learning mangement. These findings indicate that the instructional design, online learning tools, technological support, and online learning environments have an impact on both students' and parents' perceptions and satisfaction with online learning.

Keywords: *synchronous online learning, emergency remote teaching, perception, satisfaction*

INTRODUCTION

The challenges and benefits of online learning have been the subject of continuous discussion in the past. Because of the recent COVID-19 pandemic, online learning has become more prominent and relevant. Educational institutions in various countries are being forced to shift from traditional, face-to-face teaching and learning to online methods due to unexpected circumstances, such as those brought on by COVID-19 (Altıntas Kaptan et al., 2023; Carrillo & Flores, 2020; Ferri et al., 2020; Konderla & Říhová, 2023; Mseleku, 2020).

Online learning is the use of the internet and other technologies to create materials for educational purposes, provide instructional delivery, and implement program management (Gurvitch & Kim, 2023). Several studies have focused on the effectiveness, challenges, opportunities, and limitations of online learning during the COVID-19 pandemic. The advantages of online learning have been highlighted and include flexibility of time and location, savings on gas and other expenditures, reduced travel times on crowded buses or local trains, time management, and having greater

time to spend with family (Al-Mawee et al., 2021; Armstrong-Mensah et al., 2020; Müller et al., 2021; Wargadinata et al., 2020). However, there have been some complaints about the disadvantages and limitations of online learning (Ferri et al., 2020; Mseleku, 2020). Although online learning had the potential to assist teachers in facilitating learning during the COVID-19, it was ineffective and teachers were dissatisfied due to their inability to implement online learning, a lack of cooperation between school and parents, and unsuitable internet services (Fauzi & Khusuma, 2020). The efficacy of online learning is further hampered by insufficient technology resources and the lack of face-to-face teacher-student interaction (Adnan & Anwar, 2020). Lau and Lee (2021) reported that pupils struggled with online learning because of home environment constraints and their inability to participate in learning autonomously, and, as a result, parents were dissatisfied. According to Flynn et al. (2021), large losses in academic engagement led to students having learned less during schooling at home. All of this happened so rapidly that there was little time to develop strategies to assist and support teachers and students. The communication technology tools, the competence of teachers to work within a digital environment, and the possibilities for teacher to develop digital competence were critical in adjusting to online teaching (König et al., 2020). Online learning allows teachers to identify and address a variety of concerns, including a lack of school guidelines, issues regarding student access to the internet and computer facilities, and trouble engaging students and parents (Francom et al., 2021). Students had favorable experiences with online learning with respect to the flexibility of time and location, but they had negative views regarding the lack of social interaction and motivation to learn online (Al-Mawee et al., 2021; Basar et al., 2021).

Currently, the two main types of online learning environments are asynchronous and synchronous learning (Altıntas Kaptan et al., 2023; Fabriz et al., 2021; Scheiderer, 2024). The synchronous online learning environment is a type of learning where participants can interact with the instructor and each other in real time by utilizing synchronous online learning tools such as chat rooms or videoconferencing (Ji et al., 2022). These learning environments had positive effcts on students' learning satisfaction (Zou et al., 2021). Learning engagement is an important predictor of students' academic achievement, and the synchronous learning environment was found to have various effects on students' cognitive engagement. Teaching presence was shown to have a direct positive impact on cognitive engagement, whereas social and technological presence had no effect on students' cognitive engagement (Shi et al., 2021). Furthermore, student engagement has been found to be an indicator of academic achievements and student satisfaction (Elshami et al., 2022). Recently, Dınh (2023) reported on the impact of synchronous online learning environment on students' cognitive engagement and learning outcomes. Rahyasih et al. (2023) concluded that communication, digital media, engagement, facilities, and tutorials all have a direct impact on the quality of online learning. The readiness of the teachers and students, online learning tools, technological support, and online learning environment may have an impact on students' and parents' perceptions and satisfaction of online learning. The satisfaction of students is an essential component of educational activities are feedback from students is an important part of assessing the quality of education. This feedback allows the evaluation of the process by comparing the students' expectations with the current situation. An evaluation of student satisfaction allows educational institutions to improve online learning (Pangarso & Setyorini, 2023; Taşkın et al., 2023).

This reseach aimed to study the influence of a synchronous online learning environment on students' and parents' perceptions and satisfaction during emergency remote teaching at a demonstration school in Thailand. The instructional design for online teaching and learning, the availability of students' online learning tools, students' and parents' perceptions and satisfaction with synchronous online learning were investigated while using an online teaching and learning model that was implemented at the demonstration school in Thailand during the COVID-19 pandemic.

METHODOLOGY

Population and Sample

This research survey was sent to teachers (N = 70), students in Grades 4–6 (N = 208), and students in Grades 7–12 (N = 773), for a total of 981 students, and parents (N = 981) from a demonstration

school in Thailand. The participants were invited to respond to an online questionnaire on the online teaching and learning model that was implemented at the demonstration school in Thailand. Participation was voluntary. A link to the questionnaire via Google Forms was distributed to the participants using the LINE communication application. I received 45 teacher responses (64.29%) and 615 student responses (62.69%), which composed of 148 responses from students in Grades 4–6 (71.15%) and 467 responses from students in Grades 7–12 (60.41%). A total of 415 responses were received from parents (42.30%).

Research Instruments, Data Collection, and Analysis

The study employed a mixed method approach (both quantitative and qualitative) using a questionnaire as the research method. The instructional design for online teaching and learning survey was a list of 23 questions asking teachers to identify the online teaching and learning model, online teaching and learning platform, online teaching and learning activities, and online learning assessment they used. The online learning tools availability survey was a list of 14 questions asking students to report on the tools they have or had used (Yes) or those they do not have or never used (No). The mean percentages were then matched using a criteria for interpreting that resulted in the following definitions: very high (81–100), high (61–80), moderate (41–60), low (21–40), and very low (0–20).

The perceptions of online learning survey, adapted from Basar et al. (2021), had 15 questions and the satisfaction with online learning survey had 12 questions. Both surveys featured a five-Likert scale questionnaire and included open-ended questions. Students and parents were asked to choose one of the following options for each question: *strongly agree* (5), *agree* (4), *neutral* (3), *disagree* (2), and *strongly disagree* (1). The mean values were then compared with Best's criteria (Best, 1981) to give the following interpretations: very high (4.50–5.00), high (3.50–4.49), moderate (2.50–3.49), low (1.50–2.49), and very low (1.00–1.49). The participants were also invited to answer open-ended questions with additional comments. To confirm the questionnaire's validity, it was sent to three experts who were asked to make changes and provide feedback on the clarity and relevance of the items. The Item Object Congruence of each item was determined to be 0.67–1.00 and the questionnaires' reliability using Cronbach's alpha coefficient was 0.896.

This research was approved by the Human Research Ethics Committee, Srinakharinwirot University, Thailand with the research project code: SWUEC-216/2564. The participants were informed of their rights and were asked for permission at every step of the research process. Informed consent and a link to the questionnaire via Google Forms were distributed to the participants, who were asked to respond to the items using a checklist or a single choice in a Likert scale questionnaire and to provide additional remarks by using open-ended questions. The participants were not asked for any personally identifiable information. All data were collected anonymously, and no names or other identifying information were collected. The responses from the questionnaire were analyzed using frequency, mean (*M*), standard deviation (*SD*), and content analysis.

RESULTS

Instructional Design for Online Teaching and Learning

The results for the instructional design for online teaching and learning survey are summarized in Table 1. Most teachers preferred live teaching (93.30%) through Microsoft Teams (96.70%) as the main platform to facilitate online teaching and learning. The teachers provided self-study documents, media, and other online learning resources (36.72%) and provided prerecorded videos to students (21.35%). They used an online active teaching and learning model (96.70%). They assigned group and individual tasks (80.14%) and used various applications such as Mentimeter, Quizizz, Kahoot, etc. to design active learning activities (75.82%). These activities allowed students to search information (85.76%) and to exhibit their work using electronic media such as infographics and videos (65.43%). The activities provided opportunities for teacher-student interactions including small group discussions (65.43%). Teachers employed various online learning assessments such as quizzes/tests (78.59%), homework (76.36%), challenging tasks/games (70.57%), and presentations (36.74%).

Availability of Students' Online Learning Tools

The results of the online learning tools availability survey are presented in Table 2. Students had suitable online learning facilities such as a

Table 1.
Instructional Design for Online Teaching and Learning

Item*	Mean (%)	Interpretation
Online Learning Modes		
1. Live teaching and recording videos for later use	93.30	Very high
2. Provide self-study documents, media, and other learning resources	36.72	Low
3. Provide prerecorded videos to students	21.35	Low
4. Live teaching and no recording videos for later use	20.00	Very low
5. Others	5.43	Very low
Online Learning Platforms		
6. Microsoft Teams	96.70	Very high
7. Zoom	42.30	Moderate
8. Google meet	12.00	Very low
9. Google classroom	10.15	Very low
10. Others	3.30	Very low
Online Learning Activities		
11. Teachers use active teaching and learning model	96.70	Very high
12. The activities allow students to search information from the internet	85.76	Very high
13. Teachers assign group and individual tasks	80.14	Very high
14. Teachers use various apps like Mentimeter, Quizizz, Kahoot, etc. to design learning activities	75.82	High
15. The activities allow students to exhibit their work using electronic media such as infographics, videos, etc.	68.31	High
16. The activities provide opportunities for teacher-student interactions such as group discussion	65.43	High
17. Others	17.64	Very low
Online Learning Assessments		
18. Quizzes/tests	78.59	High
19. Homework	76.36	High
20. Challenging tasks/games	70.57	High
21. On-hand/report	46.73	Moderate
22. Presentations	36.74	Low
23. Others	12.41	Very low

Note. *Teachers had the option of selecting more than one response.

smartphone/tablet (98.27%), laptop/desktop computer (81.89%), and internet access to work from home (95.14%). Few students did not have a smartphone/tablet (1.73%) and internet access to work from home (4.86%), while 18.12% of students did not have a laptop/desktop computer, the majority of them were likely to utilize their smartphone or tablet for online learning. Students with a costly internet package for online learning (54.25%) and signal or internet connection constraints (43.87%) were found to be at a moderate level. During the COVID-19 epidemic, the majority of students (96.07%) used Microsoft Teams as an online learning platform. Most students utilized the LINE application to engage with others (99.24%).

Table 2.
Online Learning Tools Availability

Item	Yes (%)	No (%)	Interpretation
1. I have a smartphone/tablet.	98.27	1.73	Very high
2. I have a laptop/ desktop computer.	81.89	18.12	Very high
3. I have internet to work from home.	95.14	4.86	Very high
4. I have a costly internet package for online learning.	54.25	45.75	Moderate
5. I have signal or internet connection constraints.	43.87	56.13	Moderate
6. I have a webcam on my computer for online meetings.	69.79	30.22	High
7. I use Microsoft Teams for online learning.	96.07	4.32	Very high
8. I use Zoom for online learning.	95.69	3.93	Very high
9. I use Line for online learning.	76.49	23.51	High
10. I use Google classroom for online learning.	65.34	34.67	High
11. I use Google meet for online learning.	47.12	52.89	Moderate
12. I have an email address to communicate with others.	93.65	6.35	Very high
13. I have LINE application to communicate with others.	99.24	0.77	Very high
14. I have Facebook to communicate with others.	76.85	23.15	High

Perceptions of Online Learning

The students' responses to the perception of online learning survey are shown in Table 3. It was found that students highly agreed that they could use media and technology for online learning (97.97%). They also highly agreed that they studied online with live teaching in accordance with the schedule (95.95%), they used the LINE application and Facebook to communicate with others (93.92%), they received guidance and advice from teachers (88.21%), they searched for information from other learning resources (87.10%), they could schedule self-directed learning time (83.60%), and they enjoyed learning through challenging tasks/ games (82.32%). They also agreed that they studied online from other learning tools (78.08%), they were motivated for online learning (78.80%), and they dared to question teachers (76.24%). The results show that students moderately agreed that they reviewed the lesson from teaching clips after finishing the class (59.13%) and they used online learning to complete group assignments (59.87%). Also, they moderately agreed that there was no difference in effectiveness between face-to-face learning and online learning (41.87%). Interestingly, students highly agreed that face-to-face learning with teachers is still important (96.93%). They also recognized that online learning could help in the prevention of the spread of COVID-19 (91.34%).

The parents' responses to the perception of online learning survey are presented in Table 4. The results show that parents highly agreed that they were concerned about their children's ability to attend school regularly (92.85%). Also, they highly agreed that they allowed children to study online by themselves (79.80%), they assisted children to finish homework/assignments (69.63%), and they helped their children to find other online learning materials and resources (78.80%). The parents moderately agreed that they guided and supported children during online learning (51.00%) and believed that there was no difference in effectiveness between face-to-face and online learning (57.54%). However, they disagreed that they assisted children in using learning platforms such as Zoom and Microsoft Teams (39.42%). This was because the students could use such platforms by themselves and is consistent with the 97% of parents who allowed their children to study online at home. Further, only 5.80% of parents

Table 3.
Students' Perception of Online Learning

Item	SA (%)	A (%)	MA (%)	D (%)	SD (%)	Total of agreement (%)	Interpretation
1. I study online with live teaching in accordance with the schedule.	58.20	27.07	10.68	2.76	1.29	95.95	Very High
2. I review the lesson from teaching clips after finishing the class.	8.66	17.50	32.97	24.11	16.76	59.13	Moderate
3. I study online from other learning tools.	16.57	27.26	34.25	14.00	7.92	78.08	High
4. I search for information from other learning resources.	23.57	34.25	29.28	9.22	3.68	87.10	Very High
5. I get guidance and advice from teachers.	24.49	37.38	26.34	9.03	2.76	88.21	Very High
6. I plan my time for self-directed learning.	16.94	25.78	40.88	10.32	6.08	83.60	Very High
7. I have motivation for online learning.	16.39	30.52	31.89	12.39	8.81	78.80	High
8. I dare to ask questions of teachers.	17.68	22.1	36.46	15.1	8.66	76.24	High
9. I use Line and Facebook to communicate with others.	46.22	30.02	17.68	3.32	2.76	93.92	Very High
10. I am able to use media and technology for online learning.	59.11	27.44	11.42	1.29	0.74	97.97	Very High
11. I appreciate learning through challenging tasks/games.	30.94	27.62	23.76	10.13	7.55	82.32	Very High
12. I feel that there is no difference in effectiveness between face-to-face and online learning.	4.87	11.73	25.27	37.45	20.68	41.87	Moderate
13. I use online learning to complete group assignments.	18.43	13.17	28.27	29.45	10.68	59.87	Moderate
14. I feel that face-to-face learning with teachers is important.	57.12	29.23	10.58	2.13	0.94	96.93	Very High
15. I recognize that online learning can help in the prevention of the spread of COVID-19.	37.57	31.12	22.65	4.79	3.87	91.34	Very High

Note. SA = *strongly agree*, A = *agree*, MA = *moderate agree*, D = *disagree*, SD = *strongly disagree*, total of agreement = MA + A + SA

took their children with them to study online at work. Despite most parents recognizing that online learning could help in the prevention of the spread of COVID-19 (97.78%), they highly agreed that face-to-face learning with teachers is still important for learning (90.40%).

Satisfaction with Online Learning

The responses of both students and parents to the satisfaction with online learning survey are shown in Table 5. The results revealed that students' satisfaction with online learning was at a high level (M = 3.86, SD = 0.74). They were satisfied with the suitability of the online learning objectives, tools, media and technology support, contents, activities, and assessments. The overall mean score of parents' satisfaction with online learning was also found to be high (M = 4.09, SD = 0.77). They were satisfied with the usefulness of online learning platforms, the support of homeroom teachers in providing information and communicating with

Table 4.
Parents' Perception of Online Learning

Item	SA (%)	A (%)	MA (%)	D (%)	SD (%)	Total of agreement (%)	Interpretation
1. I let my children study online at home.	54.25	29.57	13.18	1.43	1.57	97.00	Very High
2. I take my children to study online at work.	0.78	3.41	1.61	43.14	51.06	5.80	Very Low
3. I allow my children to create their own online classes.	18.12	26.83	32.05	15.87	7.13	77.00	High
4. I guide and support my children during online learning.	21.18	19.31	10.51	28.45	20.55	51.00	Moderate
5. I let my children study online by themselves.	25.65	27.82	26.33	11.43	8.77	79.80	High
6. I assist my children to use learning platforms like Zoom/ Microsoft Teams.	10.44	19.76	9.22	40.07	20.51	39.42	Low
7. I assist my children to finish homework/ assignments.	15.68	26.84	27.11	18.16	12.21	69.63	High
8. I assist my children to find other online learning materials/resources.	36.81	28.57	13.42	17.32	3.88	78.80	High
9. I have concern about whether or not my children will be able to attend school regularly.	40.15	34.22	18.48	5.11	2.04	92.85	Very High
10. I believe that there is no difference in effectiveness between face-to-face and online learning.	20.55	19.38	17.61	30.21	12.25	57.54	Moderate
11. I believe that face-to-face learning with teachers is important for learning.	35.51	29.23	25.66	8.42	1.18	90.40	Very High
12. I recognize that online learning can help in the prevention of the spread of COVID-19.	39.53	32.76	25.49	1.47	0.75	97.78	Very High

Note. SA = *strongly agree*, A = *agree*, MA = *moderate agree*, D = *disagree*, SD = *strongly disagree*, total of agreement = MA + A + SA

students and parents, the online learning management, the announcement of information through the school's website and Facebook page, the suitability of online teaching and learning schedules, and the schools' acknowledgement of the feedback and suggestions of parents to develop the quality of online learning.

DISCUSSION

COVID-19 has affected academic institutions all around the world. Teachers, students, and parents were all confronted with an unprecedented situation because of school lockdowns. Asynchronous and synchronous learning are two categories for online learning environments. The establishment of a good learning environment is one of the most significant factors in the efficacy of online teaching and learning (Dınh, 2023; Santos, 2021), because the learning environment had a favourable effect on the students' satisfaction with their learning experiences (Zou et al., 2021). Therefore, in the current study, numerous platforms and applications were used for online teaching and learning, including Microsoft Teams, Zoom, Google Classroom, and the LINE application.

For asynchronous learning, many learning tools and resources were created, including

Table 5.
Satisfaction with Online Learning

Item	*M*	*SD*	Interpretation
Students' Satisfaction			
1. The suitability of online learning objectives	3.93	0.83	High
2. The suitability of online learning contents	3.83	0.83	High
3. The suitability of online learning activities	3.82	0.80	High
4. The suitability of online learning tools, media and technology support	3.90	0.81	High
5. The suitability of online learning assessments	3.82	0.86	High
Overall mean score	3.86	0.74	High
Parents' Satisfaction			
6. The suitability of learning platforms like Microsoft Teams and Zoom	4.33	0.66	High
7. The suitability of online teaching and learning schedules	4.01	0.85	High
8. The support of homeroom teachers in providing information and communicating with students and parents	4.31	0.78	High
9. The announcement of information through the school's website and Facebook during COVID-19	4.02	0.76	High
10. The suitability of online learning management during COVID-19	4.13	0.75	High
11. The school acknowledged the feedback and suggestions of parents to develop the quality of online learning	3.98	0.82	High
Overall mean score	4.09	0.77	High

Note. *M* = mean, *SD* = standard deviation

prerecorded videos, clips, documents, worksheets, and interactive media, which were then uploaded to Google Classroom for students to study and self-learn. However, utilizing asynchronous learning may reveal the students' low level of engagement and feelings of isolation (Kim et al., 2020).

For synchronous learning, Microsoft Teams or Zoom was used for live teaching and learning. It was a suitable platform for active learning activities, especially group presentation and discussion. A learning environment was created so that students could ask questions and receive answers, engage in discussions, and exchange ideas. Students were able to effectively express their ideas when communicating with their classmates, which increased self-efficacy. Feedback has the potential to improve student understanding, the learning activities should provide opportunities for students to reflect on their knowledge and skills through peer and self-assessment (Lin et al., 2021).

The high school students were able to use Microsoft Teams, Zoom, and Google Classroom for online learning without parental assistance. They were also able to employ media and technology to support their own learning. This demonstrates that online learning can help students strengthen their technology skills. Microsoft Teams and Zoom are effective online learning tools because they are simple to use, provide class records, and facilitate communication between teachers and students throughout the learning activities (Hamarshal & Bsharat, 2022).

The challenges for online learning include access to computers, tablets, smartphones and other technological resources, as well as internet access at home. The results showed that students

had adequate online learning resources, such as a computer or other devices that had internet capabilities, which allowed them to participate in online learning. Few students did not have access to such devices. Similarly, Armstrong-Mensah et al. (2020) reported that only a few Georgia State University students lacked the digital devices essential for distance learning during COVID-19. Other studies have highlighted the disparity in internet access and possession of digital tools among students (Coello et al., 2020).

Issues about internet connectivity and other signal problems pose another challenge for online learning. Some students did experience limited internet access at home due to connectivity problems, a factor that is beyond the ability of students to address or control. Teachers conducted various online learning activities such as lectures, group discussions, and demonstrations, and students had the opportunity to use the internet to search for information. Students strongly agreed that they were able to employ media and technology for online learning. They gained knowledge and skills through challenging tasks and game competitions.

Additionally, various applications such as Mentimeter, Kahoot, Quizizz, Wordwall, Poll Everywhere, etc. were used for conducting quizzes, games, and other activities to assess students' comprehension and make learning enjoyable. Students appreciated online learning with gemification techniques because those applications increased their classroom engagement, learning effectiveness, and motivation for learning. Mentimeter and Kahoot applications were being increasingly integrated into teaching and learning environments to facilitate effective classroom learning (Gokbulut, 2020; Handoko et al., 2021; Kohnke & Moorhouse, 2022; Tao & Zou, 2023).

In Thailand, the LINE application is widely utilized for communication purposes. This application was the most efficient tool for communicating with the teacher and updating course information during the COVID-19 pandemic. Students used LINE chat application in their studies since it can be used as a communication tool as well as for academic purposes. This is congruent with the findings in Table 2, which demonstrate that the majority of students (99.24%) used the LINE application to interact with others during the COVID-19 pandemic. This is because LINE features a group chat function that allows students and teachers to communicate and exchange ideas more efficiently at any time, resulting in improved educational outcomes.

The teacher-to-student interaction and a well-designed learning environment induced students to participate in course activities and speak up about their learning needs. It fostered students' positive attitudes toward the course and its activities, gave students the confidence to complete challenging tasks, and provided higher motivation and increased engagement for them (Chiu, 2022; Wang &Tahir, 2020). Students strongly agreed that they could schedule their own learning time. They stated that online learning was beneficial because of its flexibility of location, yet students also indicated that they were anxious and exhausted from participating in online learning. This is due to the requirement to use a computer or other technology for more than six hours each day while also being expected to complete independent work.

Students and parents agreed that face-to-face learning is important for education, with most favoring the more traditional classroom approach. This is consistent with the findings of Al-Mawee et al. (2021) and Basar et al. (2021), who reported that conventional face-to-face learning with instructors was critical to student learning. Parents disagreed that they assisted their children by using learning platforms such as Microsoft Teams and Zoom during online learning. This is because most students were able to access the online learning platform independently. According to the findings of a survey of high school students, the majority could acess online learning without the assistance of their parents. On the other hand, primary school students necessitated parental involvement and support (Brown et al., 2020; Lawrence & Fakuade, 2021). Students and parents were satisfied with online learning because of suitable learning facilities, the use of appropriate online learning platforms, and well-prepared online learning management. According to other research, parents were disappointed with online learning due to a lack of internet connection and constraints in the home environment (Lau & Lee, 2021).

The findings of the open-ended questionnaires and interviews with teachers, students,

and parents concerning the difficulties, obstacles, needs, and suggestions for online learning management are revealing. Students said that online learning allowed them to search for information on the internet and through other resources. They learned how to use various learning tools and applications, enjoyed challenging tasks and gaming activities, and reviewed assignments that were rapidly delivered to them via the internet. Many students stated that online learning was convenient due to the ability to study anywhere and whenever they needed. They were able to learn with recorded videos they could view multiple times, which they preferred and thought advantageous to their learning. In addition, both students and parents recognized that online learning may help in the prevention of the spread of COVID-19.

The instability of teachers' and students' internet connections, the difficulty of students working in groups for group assignments, and the inability to study practical/laboratory courses are all problems and obstacles associated with online learning. Students stated that not all teachers had uploaded the learning materials, videos, and teaching clips via online platforms. Students and parents additionally complained that teachers assigned too much homework, which was detrimental to students' mental and physical health. Teachers believed that the provision of homework could encourage students to acquire intellectual success and attributes such as student responsibility, learning autonomy, and time management. Homework facilitates learning and therefore has the potential to improve student learning outcomes. A number of studies have been conducted to investigate the impact of homework assignments on academic achievement and learning attitudes (Masalimova et al., 2023). Batman et al. (2022) found that homework assignments were designed for helping students review and remember the material they learned in class. Salame and Hanna (2020) also reported that online homework improved students' active involvement in class, study abilities, and comprehension. On the other hand, Yangdon et al. (2021) showed that students were dissatisfied with the number of assignments and their workload. This indicates that an increase in student workload does not necessarily mean they are learning more. Any work assigned to students should have a clear purpose and benefit, and it must be structured to foster learning and student development. Students and teachers should collaborate on homework assignments so students can find different ways to develop and improve on their understanding of the concept being taught. Parents and students in this study agreed that teachers should provide feedback to learners so they can improve their work.

RECOMMENDATION

Effective online teaching and learning systems require proper planning and suitable investment of time and resources. However, proper advanced planning for online learning was nearly impossible during the initial period of the pandemic. An online teaching and learning model was implemented at a demonstration school in Thailand during the pandemic. The feedback received on the switch from traditional, face-to-face teaching to online learning was integrated into a model with four elements: (a) Survey and Analyze, (b) Plan and Design, (c) Implement and Monitor, and (d) Evaluate and Reflect. These steps can be useful for making the transition to blended learning and Emergency Remote Teaching (see Figure 1).

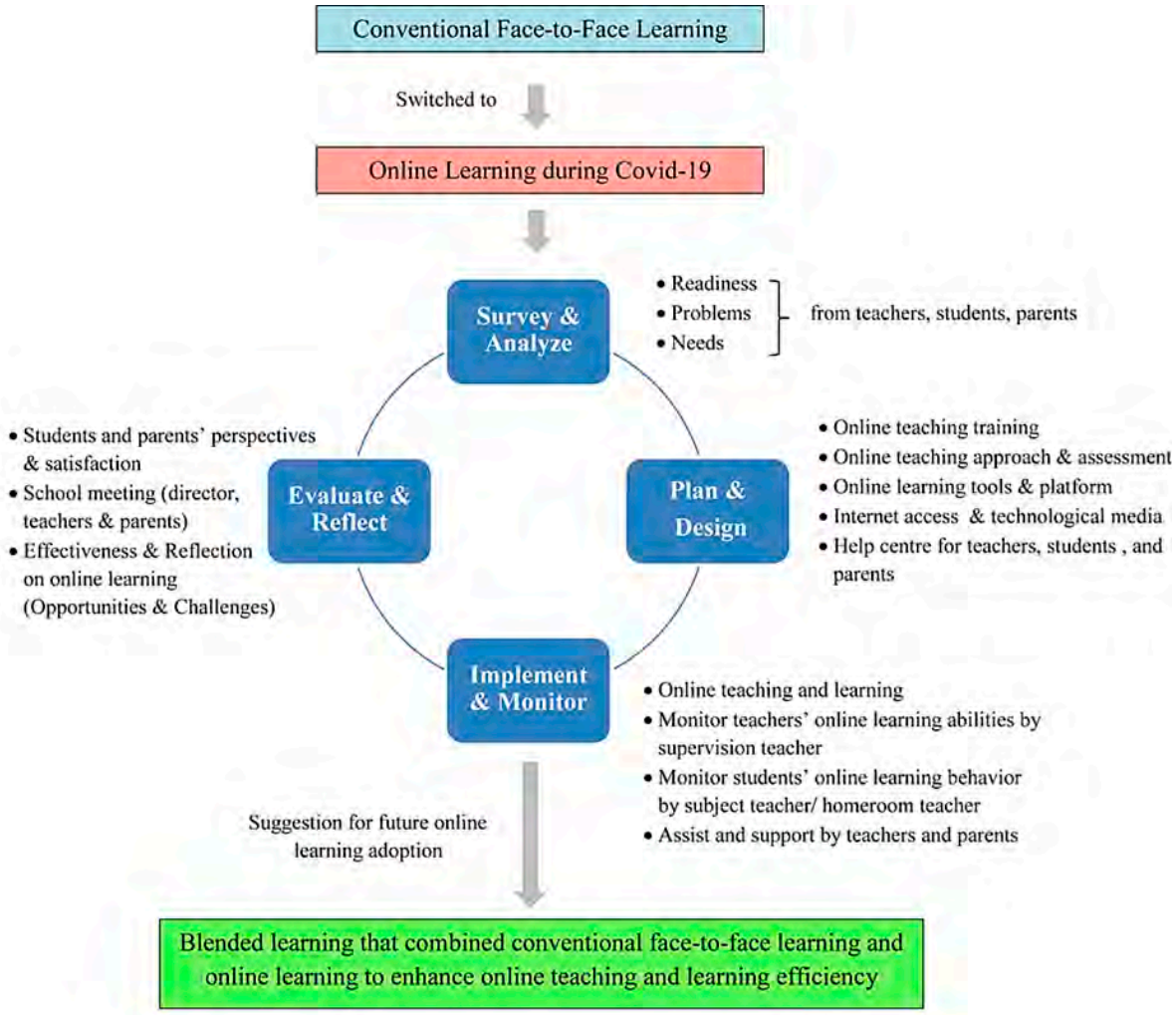
Survey and Analyze

Teachers, students, and parents were surveyed on their readiness for online learning, any problems they encountered with the online platform, and the needs of teachers and students for online teaching and learning using questionnaires and semistructured interviews. The acquired data were then examined to be able to plan effectively the transition.

Plan and Design

The analyzed data were used to plan and design online teaching trainingapproaches, and assessments, as well as online learning tools and platforms. Adequate internet access and technological media along with a help center for teachers, students, and parents, were also planned. Teaching materials in the form of interactive multimedia (i.e., animations and games) to engage and maintain students' motivation were created. An online teaching and learning schedule, unlike that typically used for in-class instruction, was devised. Important information was announced via the school's website and official Facebook page. Guidelines on how to properly use learning platforms such as Zoom and Microsoft Teams for

Figure 1.
The Visual Summary of Online Learning Management



online learning purposes were provided to teachers and students. Parents needed to be ready to assist and support their kids.

Implement and Monitor

Teachers preferred live teaching using Microsoft Teams and Zoom for online teaching and learning. In addition, the LINE application was utilized for students to communicate with each other. Teachers used various digital technologies, learning activities, and learning resources for online learning. They employed applications such as Mentimeter, Kahoot, Quizizz, Wordwall, and Poll Everywhere to engage, brainstorm, and motivate students. With technical issues identified as a potential obstacle to online learning, IT staff were available to provide assistance and support as needed. The coaching and monitoring models were used to enhance teachers' online teaching competency. Moreover, students' online learning behavior was recorded by subject teachers and then reported to parents.

Evaluate and Reflect

The efficacy of online learning was evaluated. Students and parents were provided with a survey on their perceptions and satisfaction with online learning. A school meeting that included the school director, teachers, and parents was conducted at the end of semester through Microsoft Teams to discuss and reflect on the effectiveness and problems of online learning. The school then contributed recommendations and suggestions to

improve the quality of online learning during the COVID-19 pandemic.

Suggested Model for Schools

Based on the findings, the school should develop a comprehensive plan for effective online teaching and learning. Firstly, the teaching approach and assessments should be adjusted for the online environment. Teachers must adapt to new styles and ways of teaching online, with training provided on how to create interactive multimedia to engage and maintain students' motivation. Innovations in teaching methods or new approaches to maintain students' attention and participation on screen for extended time are required. In terms of assessments, the written tests and exams should be formative, with a strong emphasis on higher-order thinking skills and real-world applications (Müller et al., 2021). Secondly, student's screen usage should be addressed. The amount of time that students spend on electronic devices, and the overall screen-time required for students to participate in online learning each day, should be reduced to less than six hours each day. Moreover, sufficient break times during the periods or sessions should be provided for students to rest. Finally, the future direction of learning during and post COVID-19 pandemic should be a blended or hybrid approach to leverage the strengths of online learning and on-site session.

CONCLUSION AND LIMITATIONS

In this work, an online learning management system for a demonstration school was implemented in four steps during emergency remote teaching: (1) survey and analyze, (2) plan and design, (3) implement and monitor, and (4) evaluate and reflect. Students and parents were surveyed about the model and expressed satisfaction with online learning, which served as confirmation of its efficacy. The results showed that the instructional design for online teaching and learning, availability of students' online learning tools, technological support, and online learning environments had an impact on students' and parents' perceptions and satisfaction of online learning during emergency remote teaching. As a result, both teachers and students adjusted to the new normal caused by the COVID-19 pandemic by mastering new education technologies. In turn, this enabled them to improve their knowledge and skills to properly manage learning. These findings are useful for school administrators, teachers, students, and other stakeholders to develop effective online learning environments.

The limitation of this research is the small sample size and nonrandom sampling that were used in this study. For future research, the sample size should be increased and random sampling techniques used. The sample should be randomly drawn from several demonstration schools from all regions of Thailand. Future research should also investigate how blended learning affects teaching and learning efficacy.

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References

Adnan, M., & Anwar, K. (2020). Online learning amid the COVID-19 pandemic: Students' perspectives. Journal of Pedagogical Sociology and Psychology, 2(1), 45–51. https://doi.org/10.33902/JPSP.2020261309

Altıntas Kaptan, M. A., Edis, E., & Unlu, A. (2023). Assessment of synchronous online architechture education from students' perspective. Turkish Online Journal of Distance Education, 24(4), 50–76. https://doi.org/10.17718/tojde.1213077

Al-Mawee, W., Kwayu, K. M., & Gharaibeh, T. (2021). Student's perception on distance learning during COVID-19 pandemic: A case study of Western Michigan University, United States. International Journal of Educational Research Open, 2, 100080. https://doi.org/10.1016/j.ijedro.2021.100080

Armstrong-Mensah, E., Ramsey-White, K., Yankey, B., & Self-Brown, S. (2020). COVID-19 and distance learning: Effects on Georgia State University School of Public Health Students. Frontiers in Public Health, 8, Article 576227. https://doi.org/10.3389/fpubh.2020.576227

Basar, Z. M., Mansor, A. N., Jamaludin, K. A., & Alias, B. S. (2021). The effectiveness and challenges of online learning for secondary school students—A case study. Asian Journal of University Education, 17(3), 119–129. https://doi.org/10.24191/ajue.v17i3.14514

Batman, K. A., Beidoglu, M., & Koklu, S. (2022). Homework assignments for the science and technology course in 5th grade in Northern Cyprus. Cogent Education, 9(1), 2149227. https://doi.org/10.1080/2331186X.2022.2149227

Best, J. W. (1981). Research in education (4th ed.). Prentice-Hall.

Brown, S. M., Doom, J. R., Lechuga-Peña, S., Watamura, S. E., & Koppels, T. (2020). Stress and parenting during the global COVID-19 pandemic. Child Abuse & Neglect, 110(Part2), 104699. https://doi.org/10.1016/j.chiabu.2020.104699

Carrillo, C., & Flores, M. A. (2020). COVID-19 and teacher education: A literature review of online teaching and learning practices. European Journal of Teacher Education, 43(4), 466–487. https://doi.org/10.1080/02619768.2020.1821184

Chiu, T. K. F. (2022). Applying the self-determination theory (SDT) to explain student engagement in online learning during the COVID-19 pandemic. Journal of Research on Technology in Education, 54(sup1), S14–S30. https://doi.org/10.1080/15391523.2021.1891998

Coello, J. G., Salazar, J. T., & Taborda, M. L. N. (2020). Peruvian students in pandemic: Digital gap and what is done from engineering programs? In Proceedings of the 2020 IEEE International Symposium on Accreditation of Engineering and Computing Education (ICACIT) Arequipa, Peru, 5–6 November 2020 (pp. 1–4). IEEE. https://doi.org/10.1109/ICACIT50253.2020.9277688

Dınh, C. T. (2023). Impact of synchronous online learning environment on students' cognitive engagement and learning outcomes. Turkish Online Journal of Distance Education, 24(3), 21–38. https://doi.org/10.17718/tojde.1165209

Elshami, W., Taha, M. H., Abdalla, M. E., Abuzaid, M., Saravanan, C., & Al Kawas, S. (2022). Factors that affct student engagement in online learning in health professions education. Nurse Education Today, 110, 105261. https://doi.org/10.1016/j.nedt.2021.105261

Fabriz, S., Mendzheritskaya, J., & Stehle, S. (2021). Impact of synchronous and asynchronous settings of online teaching and learning in higher education on students' learning experience during COVID-19. Frontiers in Psychology, 12, 733554. https://doi.org/10.3389/fpsyg.2021.733554

Fauzi, I., & Khusuma, I. H. S. (2020). Teachers' elementary school in online learning of COVID-19 pandemic conditions. Jurnal Iqra': Kajian Ilmu Pendidikan, 5(1), 58–70. https://doi.org/10.25217/ji.v5i1.914

Ferri, F., Grifoni, P., & Guzzo, T. (2020). Online learning and emergency remote teaching: opportunities and challenges in emergency situations. Societies, 10(4), 68. https://doi.org/10.3390/soc10040086

Flynn, N., Keane, E., Davitt, E., McCauley, V., Heinz, M., & Mac Ruairc, G. (2021). Schooling at home in Ireland during COVID-19: Parents' and students' perceptions on overall impact, continuity of interest, and impact on learning. Irish Educational Studies, 40(2), 217–226. https://doi.org/10.1080/03323315.2021.1916558

Francom, G. M., Lee, S. J., & Pinkney. H. (2021). Technologies, challenges and needs of K–12 teachers in the transition to distance learning during the COVID-19 pandemic. TechTrends, 65, 589–601. https://doi.org/10.1007/s11528-021-00625-5

Gurvitch, R., & Kim, G. (2023). Enhancing online instruction through better interactions. Journal of Educators Online, 20(4), 1–12. https://doi.org/10.9743/JEO.2023.20.4.9

Gokbulut, B. (2020). The effect of Mentimeter and Kahoot applications on university students' e-learning. World. Journal on Educational Technology: Current Issues, 12(2), 107–116. https://doi.org/10.18844/wjet.v12i2.4814

Hamarsha, M. M., & Bsharat, T. R. K. (2022). The influence of Microsoft Teams App besides Zoom App in improving teaching and learning the English language during (COVID-19) pandemic from the English teachers' perspectives in Palestine. International Journal of Science and Research, 11(1), 418–424. https://www.ijsr.net/getabstract.php?paperid=SR22108162401

Handoko, W., Mizkat, E., Nasution, A., Hambali, & Eska, J. (2021).

Gamification in learning using Quizizz application as assessment tools. Journal of Physics: Conference Series, 1783, 012111. https://doi:10.1088/1742-6596/1783/1/012111

Ji, H., Park, S., & Shin, H. W. (2022). Investigating the link between engagement, readiness, and satisfaction in a synchronous online second language learning environment. System, 105, 102720. https://doi.org/10.1016/j.system.2022.102720

Kim, D., Lee, Y., Leite, W. L., & Huggins-Manley, A. C. (2020). Exploring student and teacher usage patterns associated with student attrition in an open educational resource-supported online learning platform. Computers & Education, 156, 103961. https://doi.org/10.1016/j.compedu.2020.103961

Kohnke, L., & Moorhouse, B. L., (2022). Using Kahoot! to gamify learning in the language classroom. RELC Journal, 53(3), 769–775. https://doi.org/10.1177/00336882211040270

König, J., Jäger-Biela, D. J., & Glutsch, N. (2020). Adapting to online teaching during COVID-19 school closure: Teacher education and teacher competence effects among early career teachers in Germany. European Journal of Teacher Education, 43(4), 608–622. https://doi.org/10.1080/02619768.2020.1809650

Konderla, T., & Říhová, D. (2023). Evaluation of online teaching of mathematics and statistics and the results of university students. Journal of Educators Online, 20(4), 1–14. https://doi.org/10.9743/JEO.2023.20.4.13

Lau, E. Y. H., & Lee, K. (2021). Parents' views on young children's distance learning and screen time during COVID-19 class suspension in Hong Kong. Early Education and Development, 32(6), 863–880. https://doi.org/10.1080/10409289.2020.1843925

Lawrence, K. C., & Fakuade, O. V. (2021). Parental involvement, learning participation and online learning commitment of adolescent learners during the COVID-19 lockdown. Research in Learning Technology, 29, 1–16. https://doi.org/10.25304/rlt.v29.2544

Lin, J. W., Tsai, C. W., Hsu, C. C., & Chang, L. C. (2021). Peer assessment with group awareness tools and effects on project-based learning. Interactive Learning Environments, 29(4), 583–599. https://doi.org/10.1080/10494820.2019.1593198

Masalimova, A. R., Kuznetsova, O. A., Orekhovskaya, N. A., Panov, E. G., Svintsova, M. N., & Shevchenko, O. V. (2023). Exploring the impact of homework assignments on achievement and attitudes in science education. EURASIA Journal of Mathematics, Science and Technology Education, 19(4), em2246. https://doi.org/10.29333/ejmste/13058

Mseleku, Z. (2020). A literature review of e-learning and e-teaching in the era of Covid-19 pandemic. International Journal of Innovative Science and Research Technology, 5(10), 588–597. https://ijisrt.com/assets/upload/files/IJISRT20OCT430.pdf

Müller, A. M., Goh, C., Lim, L. Z., & Gao, X. (2021). Covid-19 emergency elearning and beyond: Experiences and perceptions of university educators. Education Sciences, 11(1), 19. https://doi.org/10.3390/educsci11010019

Pangarso, A., & Setyorini, R. (2023). The drivers of e-learning satisfaction during the early COVID-19 pandemic: Empirical evidence from an Indonesian private university. Cogent Education, 10(1), 2149226. https://doi.org/10.1080/2331186X.2022.2149226

Rahyasih, Y., Wijaya, W. M., & Syarifah, L. S. (2023). Exploring vocational students' satisfaction with online learning. Journal of Education and e-Learning Research, 10(3), 352–357. https://doi.org/10.20448/jeelr.v10i3.4668

Salame, I. I., & Hanna, E. (2020). Studying the impact of online homework on the perceptions, attitudes, study habits, and learning experiences of chemistry students. Interdisciplinary Journal of Environmental and Science Education, 16(4), e2221. https://doi.org/10.29333/ijese/8543

Santos, L. M. (2021). The flipped classroom approach in undergraduate engineering courses: Students' perceptions. Global Journal of Engineering Education, 23(3), 246–251. http://www.wiete.com.au/journals/GJEE/Publish/vol23no3/12-DosSantos-L.pdf

Scheiderer, J. (2024, August 20). What's the difference between asynchronous and synchronous learning? The Ohio State University. https://online.osu.edu/resources/learn/whats-difference-between-asynchronous-and-synchronous-learning

Shi, Y., Tong, M., & Long, T. (2021). Investigating relationships among blended synchronous learning environments, students' motivation, and cognitive engagement: A mixed methods study. Computers & Education, 168, 104193. https://doi.org/10.1016/j.compedu.2021.104193

Tao, Y., & Zou, B. (2023). Students' perceptions of the use of Kahoot! in English as a foreign language classroom learning context. Computer Assisted Language Learning, 36(8), 1668–1687. https://doi.org/10.1080/09588221.2021.2011323

Taşkın, N., Kandemir, B., & Erzurumlu, K. (2023). University student satisfaction and behavioural engagement during emergency remote teaching. Canadian Journal of Learning and Technology, 49(1), 1–26. https://doi.org/10.21432/cjlt28242

Wang, A. I., & Tahir, R. (2020). The effect of using Kahoot! for learning—A literature review. Computers & Education, 149, 103818. https://doi.org/10.1016/j.compedu.2020.103818

Wargadinata, W., Maimunah, I., Dewi, E., & Rofiq, Z. (2020). Student's responses on learning in the early COVID-19 pandemic. Journal of Education and Teacher Training, 5(1), 141–153. https://doi.org/10.24042/tadris.v5i1.6153

Yangdon, K., Sherab, K., Choezom, P., Passang, S., & Deki, S.

(2021). Well-being and academic workload: Perceptions of science and technology students. Educational Research and Reviews, 16(11), 418–427. https://doi.org/10.5897/ERR2021.4197

Zou, W., Hu, X., Pan, Z., Li, C., Cai, Y., & Liu, M. (2021). Exploring the relationship between social presence and learners' prestige in MOOC discussion forums using automated content analysis and social network analysis. Computers in Human Behavior, 115, 106582. https://doi.org/10.1016/j.chb.2020.106582