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Factors affecting effective online teaching transition in Asian universities during COVID-19

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Factors affecting effective online teaching transition in Asian universities during COVID-19

Abstract

Educational institutions, especially the higher education institutions in Asian countries such as Bangladesh and Thailand, have had to stop face-to-face educational activities during the period of COVID-19 pandemic. Online classes have been the only alternative to carry on academic activities. Teachers were suddenly compelled to transition their teaching and learning methodology from a face-to-face to an online model. Employing a quantitative research method, this study identifies factors in teacher's effective transition for successful online teaching. A total of 68 teachers experienced in higher education in Bangladesh, Thailand, India and Indonesia were interviewed by a structured questionnaire. The instrument was scrutinized and approved by a panel of 5 expert educators in higher educational institutes in both Bangladesh and Thailand. The statistical analysis indicated that professional training, students' performance evaluation, cheating concerns in exam perceived by teachers, infrastructure difficulties, lack of students' technological knowhow and difficult online classroom management influenced success in online teaching. A set of inspectional recommendations has been made that might be utilized in policy making by the educational policy makers, institutional authorities and by the practising teachers for designing effective procedures of online teaching and learning.

Practitioner Notes

1. Teachers can learn faster and adopt themselves in a new situation when obliged by the professional commitment.
2. Institutions need to provide necessary support to the teachers and students in terms of technology and training.
3. Concern of students' cheating in exams as a major obstacle to effective learning is a myth.
4. Teachers in Bangladesh and Thailand need to readdress the perception towards online and technology enhanced education.
5. All stakeholders of higher education should accept that the teaching methods need to be redesigned in favour of 21st century learners' learning approach.

Keywords

COVID-19 pandemic, Online class, Students' evaluation, Teaching-learning, Teaching method

Introduction

When on Wednesday 11th March 2020, the Director-General of The World Health Organization (WHO), Tedros Adhanom Ghebreyesus, declared the fast-spreading corona virus outbreak to be a pandemic likely to spread to all the countries on our planet, it was just a question of time before schools, colleges and universities were closed to stop the spread of the virus. Thailand's schools, colleges and universities were closed initially for two weeks from 18th March to 31st March as announced by the Prime Minister Prayut Chan-o-cha on Tuesday 17th March (Channel News Asia [CAN], 2020). The closure was later extended until 1st July 2020. In Bangladesh the deputy Education Minister, Mohibul Hasan Chowdhury announced an initial closure of all educational institutions from 17-31 March (Sakib, 2020) this was later extended until predictably September 2020 (The Business Standard [TBS], 2020). Japan, South Korea, Singapore, Malaysia, Indonesia, The Philippines, China, Hong Kong, Taiwan and Sri Lanka all closed their schools and universities late February to March 2020 (University World News, 2020).

In both Thailand and Bangladesh, universities' closure meant that many students had to switch to online learning. In Thailand private and state universities were instructed to shift classes online by the Ministry of Higher Education, Science Research and Innovation (Mala, 2020). In Bangladesh, most of the three hundred and fifty thousand students' studied at private universities started online classes as soon as they were closed for face-to-face classes (Jasim, 2020).

The purpose of this study is to identify possible factors that influence the teachers' transition. The outcomes from the analytical findings are expected to be useful for the practising teachers and institutional authorities for designing an effective transition plan. Thus, "what are the affecting factors for teachers' successful transition from face-to-face to online teaching?" is formulated as the research question. Outcomes of this study include the factors that influence the teachers' transition. A set of inspectional recommendations is formulated for informing institutions when planning training programs for online teaching or in the preparation of the online teaching guides of the government or non-governmental agencies.

In this article, the literature review section summarises relevant texts on teachers' learning patterns and their dynamics in a crisis. The next section is about research methodology followed by results from the statistical tests, which leads to a discussion on the findings and, finally, the conclusion of the study.

Literature review

As this study investigates the on-the-job learning of lecturers making a sudden and unexpected transition from the classroom to online teaching, the existing literature on learning theories, learning specific to teachers, learning due to crises was examined. The differences between online and classroom teaching were also studied.

How we learn

There are three overlapping and interconnected theories about how we learn a) behaviourist, b) cognitive and c) constructivism (Celikoz et al., 2019). Thorndike developed the stimulus-response theory in which animals and the man received a stimulus and responded to it. Skinner placed great importance on identifying the factors in the environment that caused a particular behavioural response and the reinforcement given due to a specific behaviour. Tolman, in his 1932 book *Purposive Behaviour in Animals and Men*, explained how behaviour could be adapted according

to what takes place in the environment and the purpose of that behaviour. Tolman was the first behaviourist to recognise a cognitive process.

Others have placed a greater emphasis on the cognitive part of learning process. Jean Piaget is generally credited with developing the cognitive learning theory also known as cognitive constructivism (von Glasersfeld, 1974). Piaget believed that knowledge is actively constructed by learners based on their existing cognitive structures. Therefore, he challenged the behaviourists who only focused on behaviour that could be observed and thus measured. Piaget looked at the mental processes between a stimulus and the response and noted that their prior learning and development stage would influence or modify the knowledge to be constructed from a learning experience (Philips, 1995).

Some constructivists saw the cultural development of the learner as more critical in the learning process. Lev Vygotsky (1978) developed the theory of social constructivism in which the learner builds new knowledge based on an interaction with their culture and society. Finally, the best known radical constructivism theorist Ernest (1994) saw knowledge as being constructed based on existing knowledge and invented to help us function in our own environment. However, he did not see such knowledge as necessarily being based on any kind of reality.

This study, whilst acknowledging the importance of behaviourist and cognitive learning theories, has adopted a broad constructivist approach towards leaning theory in the sense that lecturers are viewed as responsible for evaluating their performance, being active in the process of constructing new knowledge being influenced by their previous experiences including their cultural and social background. Most teachers learn precisely the same way as other people, (Bransford et al., 2000), yet the existing literature provides more details of learning methods that are especially useful for teachers.

How teachers learn

There are two main ways in which teachers learn 1) from their experiences as they teach (Dewey, 1963) and 2) interactions with other teachers (Feiman-Nemser & Parker, 1993). Teachers get knowledge and understanding from their daily contacts with their pupils, the institutions, their practical experiences with curricula, syllabi, teaching resources, and evaluating and grading of student's performance. Teachers are continually reflecting on such experiences and revising their practice in light of their evaluations. Considerably different findings are found in the work of Firing et al. (2015) where Norwegian soldiers had to wait for the debriefing after dealing with a terrorist attack on the island of Utoya before they could begin the learning process. Teachers have opportunities to learn a great deal from each other's personal experiences. This might be through formal mentoring in which a more experienced teacher takes a recruit and guides them with advice and knowledge or, more often through informal methods such as conversations between colleagues in the staff room or over lunch. In addition to these two main methods for teachers to learn, some learning occurs through in-service training or further study such as completing a higher degree course or even from other experiences such as becoming a parent (Bransford et al., 2000).

Differences between face-to-face and online teaching

There is a considerable body of literature on the differences between teaching online and in a traditional face-to-face classroom. Whilst much of it is relevant to this study, it is essential to emphasise that the existing literature is based on teachers and students who have mainly volunteered to teach online and for courses that their institutions have had time to plan. This differs from the COVID-19 lock down situation in which all institutions, teachers and students had

to go online whether they wanted to or not and in which courses designed for a face-to-face classroom had to suddenly be moved online with little or no opportunity to amend the course structure or materials before their online launch. This point is well illustrated in the institutions that have made a planned transition from the classroom to online teaching have been involved in considerable financial investments to set-up and support such courses (Siedlaczek, 2004). However, during the COVID-19 pandemic, many universities in lock down had to make an almost overnight switch using whatever resources were in place at the time such as teacher's and student's Wi-Fi connections, laptops and smart phones (Sari & Nayir, 2020).

The importance of technology was also talked about at length along with the need for hardware that worked efficiently, software that was user friendly and technical support with a clear structure in terms of roles and responsibilities. Many of the teachers in the Siedlaczek study enjoyed the professional development opportunities posed by learning how to utilise new technologies into their teaching, but this might not apply to all teachers involved in the current study as the switch to online teaching involved not only enthusiastic volunteers, but also teachers who might well have been reluctant or nervous about such change.

How a crisis can affect learning

The concept of a crisis relates to a situation in which some kind of threat or uncertainty is present with an unexpected and destabilising element (Schiffino et al., 2017). There is conventional wisdom that when humans are placed in a crisis, they learn more quickly. This idea might seem to be based entirely on circumstantial evidence such as during the Black Death Sir Isaac Newton was forced to leave Cambridge and whilst at home he saw an apple fall from a tree in the garden which led to the discovery of the law of gravity or the first computer invention during the Second World War (Fisher, 2020). However, there is more scientific evidence from the literature to support the concept that humans and animals learn faster during a crisis. Baum and Dahlin (2017) postulated that a crisis would initiate learning and change using the knowledge and experience gained during the event. Schiffino et al. (2017) used a series of games to analyze post-crisis learning and found that individuals can learn from and implement what they have learnt from a crisis.

Most of the research on learning from a crisis focuses on how organisations learn rather than individuals (Schiffino et al., 2017). Many organisations have very formalised and centralised systems to enable them to learn from any crisis and implement such learning. This is illustrated by Firing, Moen and Skarsvag (2015) who found that members of the Norwegian armed forces had restricted learning opportunities from a crisis caused by a terrorist attack on the island of Utoya on 22nd July 2011 due to the structure of the debriefing organised by the army. After the attack those involved were debriefed and it was the soldiers' potential learning opportunities to learn from each other.

A qualitative study by Hos and Cinabas (2018) throws more light on how individual learn from a crisis. Hos and Cinabas used in-depth interviews, observations and content analysis to ascertain how teachers learnt to teach Syrian refugees in Turkey during a crisis caused by war. The children were 4-6 years old who received support by the Turkish language and literacy development. The study revealed the teachers had learned to overcome challenges such as having no place to teach the children. Problem-solving was used to divide the children into small groups and teaching staff on a shift basis. The participants celebrated small achievements that helped them do this, teachers searched online for ideas and support. Such reflection allowed them to improve their teaching and help the children integrate into society. Both teachers and administrators felt that the learning had taken place due to their experience on the job.

Psychological research suggests that when faced with a threat learning will be enhanced in other ways. Abend et al. (2013) carried out tests using dot probes with neutral and angry faces followed by target probes that had to be neutralised as quickly as possible. As angry faces always appeared at the targets an association was formed between targets and a threat. Compared with a control group, the group experiencing a threat rapidly improved on the task and achieved learning saturation. Furthermore, these improvements were maintained over a long time, showing how learning under threat can improve performance and memory retention. Starita et al. (2019) worked with 25 participants in which they were subjected to threat conditioning and supervised memory recognition tests. Pictures of animals and tools were used along with a shock to create a threat whilst other pictures contained no shock and were used as within-subject control. The next day a memory test was used in which participants were shown similar pictures to the previous day, some from the shock set and others from the control or non-shock set. Starita et al. (2019) found that threat conditioning resulted in generalisation of episodic memory, an active process in which earlier conditioned learning from a threat can activate episodic memory representations of aversive experiences. Starita et al. (2019) thus support the idea that humans rapidly learn from threats and make generalisations from such learning. Learning in a crisis can accelerate certain types of learning and the existing literature suggests that this can take place during the crises itself such as in the case of the teachers working with Syrian refugee children or post-crisis or in case of the Norwegian soldiers. This study will focus on if, what and how lecturers learnt during the COVID-19 pandemic as they transitioned from classroom to online teaching.

Teaching transition during COVID-19 pandemic

Müller et al. (2021) found in their research that the transition of teaching learning during the period of COVID-19 pandemic was not easy. Creating pre-recorded lectures, making digital content, drafting a script and recording a video with necessary editing hugely contributed to the increased workload of teachers. Other difficult activities during the transition include assessments and marking in higher-order learning, limited ability to observe students during synchronous sessions and constantly monitor various inputs. In the same research it was also mentioned that teacher's self familiarising with the vast amount of new technologies and potential pedagogies, especially applicable in online teaching, had been hard and time consuming. Sari and Nayir (2020) mentioned higher education institutions made the overnight switch using whatever technological resources were available for both teachers and students. Institutional support for pedagogical approach is not very relevant as the institutions have a standard of pedagogy in their policy. During the pandemic, necessary modifications in pedagogy were not sufficiently addressed. On the other hand, teachers' training is important for adopting technology and pedagogy. Significance of teacher training for online teaching was justified and suggested for the teachers during the COVID-19 period (Nantshev et al., 2020). Institutional support was essential for the teachers to convert contents and teaching approach from face-to-face to online teaching (San-Martin et al., 2020). The authors also stated that the universities were willing to adopt technology and provide support to teachers for online teaching. However, the similar contemporary research works do not include designing and planning of a course, as a factor, to be taught in the changed setting of online education. Authors of this research identified this as a gap in relevant studies. Course design and planning for online teaching was taken into consideration as a positive influential factor towards successful transition. In addition, the classroom management was also considered as a factor of the transition, which was not properly addressed in contemporary research works on the context of higher education during COVID-19 pandemic. Both of these research gap factors are discussed in the following section of variable definitions.

Definitions of variables and hypotheses

This study was intended to find the factors influencing the successful transition in teaching from face-to-face to online. The dependent variable '*success in online teaching*' is hypothetically influenced by a set of 9 independent variables.

Professional training: Teachers need to have professional training on online teaching. Importance of training for effective teaching in general was described in scholarly articles. In-service training or further study was an influential factor of performing better as teachers (Bransford et al., 2000). In the context of mathematics teaching during the COVID-19 period, it was justified that teacher training was essential for online teaching (Nantshev et al., 2020). Alternative hypothesis (H1) was 'professional training' of teachers would positively affect the 'success in online teaching'.

Perception on teach-learn: Teachers' perception on the learning process of students and how effective teaching takes place was taken as a probable factor. Learning theories and their practices in education are the major sources of teachers' perception (Celikoz et al., 2019). It was perceived by the teachers that a crisis situation initiates and expedites learning activities (Schiffino et al., 2017). In a recently published research article, claimed as the first study to investigate the effects of the sudden transition from in-class to only online education from teachers' and students' perceptions, Lauret and Bayram-Jacobs (2021) found compelling evidence. Alternative hypothesis (H2) was 'perception on teach-learn' of the teachers would positively affect the 'success in online teaching'.

Performance evaluation: Students performance evaluation is an integral part of teaching and learning. The teaching learning process can be successful only when the evaluation is done through proper assessment methods. Challenges are increased in the online education setting. Performance evaluation was recognised as an important factor of the teaching process during COVID-19 pandemic period (Pócsová et al., 2021). Alternative hypothesis (H3) was 'performance evaluation' of the students would positively affect the 'success in online teaching'.

Student centred activities: Learners' motivation is the driving force to learn in the teaching learning process when it is student centred. The process was found as augmented in a crisis situation (Hos & Cinabas, 2018). It was also found from a before-and-after survey that the learners' motivation, in a student centred teaching process, to deal with the subject topics by increased complexity and workload remained stable (Li, 2021). Alternative hypothesis (H4) was 'student centred activities' would positively affect the 'success in online teaching'.

Course design & planning: Designing the course activities by making a plan of lectures and contents was taken into the list of probable factors. Course design was considered as an influential factor especially in the sudden transition period of teaching from face-to-face to online. The authors did not find sufficient literature supports on this. Thus, this probable factor was taken as a new dynamic in the context by filling up the research gap. Alternative hypothesis (H5) was 'course design & planning' by the teachers would positively affect the 'success in online teaching'.

Cheating concern in exam: Teachers' concern about cheating in online exams and quizzes is an added reality in the online education setting. Teachers need to prepare assessment tools with innovations and by accepting extensive workloads. Assessing every student with individual question could be a solution in the context of reasonable class size. Exam duration was a parameter of evaluation in online examination with the learning management system used (Pócsová et al., 2021). Alternative hypothesis (H6) was 'cheating concern in exam' to the teachers would negatively affect the 'success in online teaching'.

Infrastructure difficulties: Appropriate digital devices with workable internet connection facilities are the basic requirements for online education. These infrastructure facilities are required for both teachers and students. Institutions are primarily responsible for facilitating the need situation. Universities needed to invest substantially for the transition from face-to-face to online (Siedlaczek, 2004) and had provided laptops, smart phones and WiFi connections for teachers and students in applicable cases (Sari & Nayir, 2020). However, such investments and supports provided by the educational institutions may not be sufficient in every society. Alternative hypothesis (H7) was 'infrastructure difficulties' of both teachers and students perceived by the teachers would negatively affect the 'success in online teaching'.

Lack of students' knowhow: Teachers expect their students are familiar enough with the technological environment and the applications necessary to be used. Students' technological knowhow, being aware of opportunities that technology and technological tools offer for education for a particular concept and level, supported how and when various technology and technological tools could support or hinder students' learning during COVID-19 (Lauret & Bayram-Jacobs, 2021). Alternative hypothesis (H8) was 'lack of students' knowhow' perceived by the teachers would negatively affect the 'success in online teaching'.

Difficult class management: Classroom management is a common pedagogical term. However, this is a new phenomenon in the context of online teaching with a number of dynamics including students' active participation, privacy of students and teachers, cyber security and effective communication. The authors did not find sufficient research supports on this issue, which was eventually taken as a factor to fill up the research gap. Alternative hypothesis (H9) was 'difficult class management' by the teachers would negatively affect the 'success in online teaching'.

Method

The researchers intended to identify the factors of teachers' transition to online teaching during the COVID-19 pandemic based on a quantitative survey.

Data

Non-probability purposeful sampling was used for selecting 68 lecturers who participated in this study. The justifications for choosing participants selected by purposeful sampling described by McMillan and Schumacher (1993) as "They are likely to be knowledgeable and informative about the phenomena the researcher is investigating". In this case, the participants had to be teaching online in higher educational institutions and from different countries in Asia. These lecturers all had to adapt to the sudden change in teaching methodology from face-to-face to online.

The questionnaire used in this study was developed by modifying statements from the TALIS Teacher Questionnaire (OECD, 2013). The first draft of the questionnaire was then submitted to a panel of experts in teaching online. The panel was tasked with making judgments on whether the research topic's important aspects had been covered. Lyn (1986) advised that a panel consists of a minimum of three experts. In this study, five experts were engaged. Each expert was asked to rate the relevance of the statements to the content by using a five-point scale. The draft questionnaire was rewritten following the panel's advice and re-submitted in which 100% highly relevant rating was achieved. The researchers used a pilot of 30 lecturers to test reliability and internal consistency. From the completed pilot study questionnaires, the calculated Cronbach's alpha was found as 0.84. Later, from the actual data set of all 68 respondents, the point estimated Cronbach's alpha from all variables was found as 0.72. Scores above 0.7 were considered for consistency

measurement (Wiersma, 1995). The survey was conducted between September and December in 2020. The questionnaire includes both the structured and open-ended questions.

The study protocol was approved by the local Ethics Committee and all participants provided informed consent before entering the data collection form. The data were collected anonymously by using Google forms, and participants' confidentiality was assured at every stage of the research.

Analytical procedure

The study was built on a prediction design approach that used a correlation study with dependent and independent variables based on a cause-and-effect relationship (Beins, 2017). Spearman's correlation tool was used as the variables were of rank-ordered using a 5-point Likert scale. Step-wise regression tests were employed to explore the significant association between the factors that influence the success in online teaching.

Socio-demographic and other relevant variables

The demographic and teaching information of the 68 participants is shown, in the Table 1, with the variables and their respective groups.

Table 1
Information on respondents' demography and teaching experience

Variable	Groups	N	%	Total
Gender	Female	31	45.6	68
	Male	37	54.4	
Age	Below 25 years	6	8.8	68
	25 to 29 years	9	13.2	
	30 to 39 years	15	22.1	
	40 to 49 years	12	17.6	
	50 to 59 years	15	22.1	
	Above 60 years	11	16.2	
Teaching experience	Less than 1 year	4	5.9	68
	1 – 2 years	8	11.8	
	3 – 5 years	10	14.7	
	6 – 10 years	10	14.7	
	11 – 15 years	9	13.2	
	16 – 20 years	4	5.9	
	More than 20 years	23	33.8	
Teaching course(s) of -	Languages	14	20.6	82*
	Mathematics and Statistics	12	17.6	
	Science and Engineering	12	17.6	
	Social Studies	9	13.2	
	Business	12	17.6	
	Medicine and Health Science	5	7.4	
	Other disciplines	18	26.4	
At the program(s)	Vocational	5	7.4	82*
	Undergraduate	51	75.0	
	Graduate	20	29.4	
	Postgraduate	6	8.8	
Online teaching before COVID-19 crisis	Yes	20	29.4	68
	No	48	70.6	

* The total number is counted with the overlapping selections respective groups.

Results

From the descriptive statistics as shown in Table 1, it is observed that nearly 56% of all respondents were at least 40 years by age. Only 6% of the respondents were new teachers with less than one year of teaching experience. On the other hand, nearly 34% of the teachers had more than 20 years of teaching experience while 82% had at least 3 years of teaching experience. There was quite a variety in the disciplines of courses or subjects taught by the responding teachers. The spread of discipline overlapped in some cases. The program levels also overlapped in some cases as some teachers taught courses at two different program levels. More than 80% of the teachers taught the courses for undergraduate and graduate levels. More than 70% of the respondents did not have online teaching experience before the COVID-19 crisis period.

Factors influencing success in online teaching

Spearman rank-order correlation test was conducted. All nine independent variables were considered for the correlation test with the dependent variable. Only significant correlations are shown in Table 2. The full correlation results are found in the Table 3 of Appendix.

Table 2

Spearman's correlations among variables at below 0.001 level significance

Dependent Variable	Independent Variable	rs
Success in online teaching	Professional training (of teachers for online teaching)	0.442
	Performance evaluation (of students)	0.566
	Cheating concern in exam (done by students)	-0.533
	Infrastructure difficulties (for online teaching learning)	-0.436
	Lack of students' knowhow (to attend online classes)	-0.421
	Difficult class management (in virtual classroom)	-0.606

Step-wise regression analysis

According to the Table 4 shown in the Appendix, adjusted R-sq values are 0.000, 0.366, 0.484 and 0.514 in four models. For the auto-correlation among independent variables, the Durbin-Watson values are reported as 1.930, 1.854, 2.012 and 2.304 respectively. The regression co-efficient of 'professional training', 'performance evaluation', 'cheating concern', 'infrastructure difficulties', 'lack of students' knowhow' and 'difficult class management' are 0.271, 0.377, -0.331, -0.248, -0.246 and -0.412 respectively. The level of statistical significance was less than 0.001 in every case. The alternative hypotheses one, three, six, seven, eight and nine were confirmed accordingly. Eventually, the hypotheses two, four and five did not retain. The predictors 'professional training' and 'performance evaluation' influence the 'success in online teaching' in the same direction. Other predictors 'cheating concern', 'infrastructure difficulties', 'lack of students' knowhow' and 'difficult class management' influence the 'success in online teaching' in opposite direction.

Discussion

On demography and descriptive statistics

More than half of the teachers were at least 40 years old and had at least 11 years of teaching experience. Thus, most of the responses were from seasoned practitioners in the higher education teaching profession. Professionals from most fields can understand the changes they need to make

in their respective disciplines allowing them to manage the changes by learning new required skills and knowledge. This learning behaviour was supported by Bransford et al. (2000) and also by John Dewey (1963).

There were quite wide varieties in the subjects taught by the lecturers in this study and the levels of programs in which they taught. However, this study did not find significant variations in the transition activities from face-to-face to online classes in terms of the subject taught or the program level. More than 70% of teachers did not have experience of teaching online before the COVID-19 crisis. Interestingly, most of these teachers were well planned for the online classes though they did not think the online classes could be as effective as face-to-face classes.

On correlation test results

‘Success in online teaching’ had a weak and positive correlation (0.442) with ‘professional training’ (Moore et al., 2013). From the underlying dimensions it was found that the majority of the teachers who conducted useful individual or joint educational researches in the previous two years time thought that the online classes could be as effective as in face-to-face learning. This finding supported Bransford et al. (2000) observations that the teachers’ learning could occur through in-service training or further study. A recent article has suggested that higher education institutions should allocate resources and funding for professional development, which may include include subscriptions to online software, online teaching-learning tools, online collaboration and video conferencing tools (Al-Naabi et al., 2021).

There was a moderate and positive relationship (0.566) between ‘success in online teaching’ and ‘performance evaluation’ (Moore et al., 2013). Nantschev et al. (2020) also found similar results as in this study that the teachers’ pedagogical knowledge on teaching and students evaluation significantly influences the teaching learning process.

‘Success in online teaching’ had a moderate and negative correlation (-0.533) with ‘cheating concern in exam’. By the underlying dimensions, teachers reported that the cheating concern in the exams was possible to mitigate by variety of questions and time constraints. This was supported by Pócsová et al. (2021).

There was a weak and negative relationship (-0.436) between ‘success in online teaching’ and ‘infrastructure difficulty’. From the underlying dimensions it was found that Students’ slow internet connection, inadequate or inappropriate devices of students, insufficient infrastructure facilities provided by the educational institutions were the obstructing factors to successful online teaching. This finding of the study contradicts Siedlaczek (2004) findings where a certain amount of institutional investment and infrastructural facilities were suggested for building a platform of online classes.

‘Success in online teaching’ had a weak and negative correlation (-0.421) with ‘lack of students’ knowhow’ (Moore et al., 2013). Students’ comfort levels were found influenced by the use of digital devices and internet connection facilities. Sari and Nayir (2020) found the similar factors in their qualitative research article on challenges of distance education during the COVID-19 pandemic period.

There was a moderate and negative relationship (-0.606) between ‘success in online teaching’ and ‘difficult class management’ (Moore et al., 2013). Among the correlations, ‘difficult class management’ was the highest in value, though not strong in statistical interpretation. The other three independent variables ‘perception on teach-learn’, ‘student centred activities’ and ‘course

design & planning' were not significantly influential to the dependent variable 'success in online teaching'.

On step-wise regression results

Adjusted R-sq values ensure that the linear regression can explain 36.6% to 51.4% variance in the data. Durbin-Watson values are close to 2.0 and lie within the critical range of $1.5 < DW < 2.5$ that ensures no first order linear auto-correlation among the independent variables (Gujarati & Porter, 2009). According to the regression values found, one unit increment in 'professional training' will increase 0.271 units in 'success in online teaching'; one unit increment in 'performance evaluation' will increase 0.377 units in 'success in online teaching'; one unit increment in 'cheating concern in exam' will decrease 0.331 units in 'success in online teaching'; one unit increment in 'infrastructure difficulties' will decrease 0.248 units in 'success in online teaching'; one unit increment in 'lack of students' knowhow' will decrease 0.246 units in 'success in online teaching'; and one unit increment in 'difficult class management' will decrease 0.412 units in 'success in online teaching'.

Overall discussion

Despite some significant differences between the existing literature and this study's context many points remain pertinent to this paper. Siedlaczek (2004) held focus group meetings with in-depth follow-up interviews of college lecturers who had both face-to-face and online teaching experiences. The teachers involved in this study expressed the view that the institution needed to have policies developed for online courses specifically rather than merely adapting existing face-to-face policies. The teachers also expressed the need for considerable flexibility and adaptability in course design and noted that teachers who taught in a face-to-face context using a lecture-based style might have more difficulty successfully switching to online teaching.

Interestingly, in contradiction to the study's quantitative findings, teachers expressed in open-ended responses that a student centred learning environment would be more supportive to the success in online teaching. They suggested more online courses on professional development. This should have rapidly changed into a more student centred approach in which students took on greater responsibility for their learning. Teachers also noted that the students who were well-motivated and had considerable self-discipline were more successful at online learning.

Conclusion

During the COVID-19 crisis, the online class was the only alternative solution to carry on academic activities in higher education institutions of Asian countries including Bangladesh and Thailand. Teachers had to abruptly transform for teaching online by gaining new skills and making necessary adjustments in teaching-learning methods and students' evaluation. This study tried to identify influential factors in successful teachers' transition from face-to-face teaching to online. Several experienced teachers in some Asian higher education institutions were surveyed and some inspectional recommendations were made on the findings. These recommendations are expected to be used for the policy-making of effective online classes by educational institutions. Also the teachers can accept this study's observations to prepare themselves for effective online classes.

Practical implications

The authors have formulated the following recommendations for different stakeholders including policy makers and implementers.

- Teachers and academic staff in higher education will redesign their teaching and students' evaluation planning for effective learning.
- University managements will restructure the teaching learning facilities especially appropriate for the online education setting.
- Universities will reallocate infrastructure facilities by providing necessary devices and internet connectivity for both students and teachers.
- Teachers and students will recognise the importance of responsible behaviours in performance evaluation process and act accordingly to improve the quality of evaluation.
- Students will restore confidence in classroom management by active, self-directed and accountable participations in online learning.

Limitation

The survey scope was not wide-spread and could be extended to include more participants from a more number of countries and thereby increase the general applicability of the statistical tests' results. Variations of teachers' comfort in using proper technological tools by the teachers' subject affiliations were not addressed in this study. Subject affiliations of the teachers, from their academic lives, may have influences on efficient use of technology in their teaching profession. Likewise, deviations in effective use of technology in online teaching based on teachers' age range were not identified. Abilities and motivation for learning may vary in the age ranges of teachers, which may influence adapting themselves in online teaching by using new technological tools and digital devices.

Future research direction

The authors hope more research activities will be conducted on the topic of successful online teaching in higher education for finding better conclusions. In a recent research it was recognised that, a positive attitude and high self-efficacy beliefs were found to have facilitated the switch to online teaching (Kaqinari et al., 2021). More research would be the source of recommendations for designing a proper setup for successful online teaching learning. Similarly, it is also expected that sufficient research will be conducted in secondary and higher secondary levels as the online teaching learning is being extended in all education levels.

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Appendix

Table 3
Spearman's correlation coefficient (Part 1)

Variable		(DV)	(IV1)	(IV2)	(IV3)	(IV4)	(IV5)	(IV6)
Success in online teaching (DV)	Spearman's rho	—						
	p-value	—						
Professional Training (IV1)	Spearman's rho	0.442	—					
	p-value	< .001	—					
Perception on teach-learn (IV2)	Spearman's rho	0.060	0.288	—				
	p-value	0.628	0.017	—				
Performance evaluation (IV3)	Spearman's rho	0.566	0.415	0.107	—			
	p-value	< .001	< .001	0.386	—			
Student centred activities (IV4)	Spearman's rho	0.054	0.164	0.203	0.115	—		
	p-value	0.660	0.182	0.098	0.352	—		
Course design & planning (IV5)	Spearman's rho	0.075	0.079	0.243	-0.043	-0.054	—	
	p-value	0.545	0.523	0.046	0.727	0.662	—	
Cheating concern in exam (IV6)	Spearman's rho	-0.533	-0.221	0.262	-0.317	-0.064	0.169	—
	p-value	< .001	0.070	0.031	0.008	0.607	0.167	—

Spearman's correlation coefficient (Part 2)

Variable		(DV)	(IV7)	(IV8)	(IV9)
Success in online teaching (DV)	Spearman's rho	—			
	p-value	—			
Infrastructure difficulties (IV7)	Spearman's rho	-0.436	—		
	p-value	< .001	—		
Lack of students' knowhow (IV8)	Spearman's rho	-0.421	0.556	—	
	p-value	< .001	< .001	—	
Difficult class manage. (IV9)	Spearman's rho	-0.606	0.459	0.695	—
	p-value	< .001	< .001	< .001	—

Table 4
Linear Regression (Part-1)

Model Summary - Success in online teaching (DV)

Model	R	R ²	Adjusted R ²	RMSE	Durbin-Watson		
					Autocorrelation	Statistic	p
1	0.000	0.000	0.000	0.647	0.002	1.930	0.771
2	0.613	0.376	0.366	0.515	0.045	1.854	0.550
3	0.707	0.500	0.484	0.464	-0.024	2.012	0.962
4	0.732	0.536	0.514	0.451	-0.162	2.304	0.210

Coefficients						
Model		Unstandardised	Standard Error	Standardised	t	p
1	(Intercept)	3.379	0.078		43.099	< .001
2	(Intercept)	4.538	0.194		23.385	< .001
	Ind14DCM	-0.412	0.065	-0.613	-6.304	< .001
3	(Intercept)	3.351	0.344		9.749	< .001
	Ind14DCM	-0.345	0.061	-0.514	-5.641	< .001
	Ind1PDT	0.291	0.073	0.366	4.012	< .001
4	(Intercept)	2.834	0.405		6.990	< .001
	Ind14DCM	-0.371	0.060	-0.552	-6.132	< .001
	Ind1PDT	0.271	0.071	0.345	3.875	< .001
	Ind5CDP	0.213	0.095	0.195	2.243	0.028

Note. The following covariates were considered but not included: Ind2TPTL, Ind3SPE, Ind4SCA, Ind6CC, Ind7ID, Ind8NTS, Ind9LSTK, Ind10CS, Ind11SSP, Ind12LSM, Ind13AIL.

Linear Regression (Part-2)

Model Summary - Success in online teaching (DV)

Model	R	R ²	Adjusted R ²	RMSE
1	0.000	0.000	0.000	0.647
2	0.530	0.281	0.270	0.552
3	0.589	0.347	0.327	0.530

Coefficients						
Model		Unstandardised	Standard Error	Standardised	t	p
1	(Intercept)	3.379	0.078		43.099	< .001
2	(Intercept)	4.468	0.224		19.907	< .001
	Ind6CC	-0.331	0.065	-0.530	-5.083	< .001
3	(Intercept)	4.926	0.280		17.583	< .001
	Ind6CC	-0.254	0.069	-0.407	-3.663	< .001
	Ind7ID	-0.248	0.097	-0.285	-2.560	0.013

Ind6CC: Cheating concern, Ind7ID: Infrastructure difficulties

Linear Regression (Part-3)

Model Summary - Success in online teaching (DV)

Model	R	R ²	Adjusted R ²	RMSE
1	0.000	0.000	0.000	0.647
2	0.447	0.200	0.188	0.583

Coefficients						
Model		Unstandardised	Standard Error	Standardised	t	p
1	(Intercept)	3.379	0.078		43.099	< .001
2	(Intercept)	4.150	0.203		20.475	< .001
	Ind9LSTK	-0.246	0.061	-0.447	-4.058	< .001

Ind9LSTK: Lack of students' knowhow

Linear Regression (Part-4)

Model Summary - Success in online teaching (DV)

Model	R	R ²	Adjusted R ²	RMSE
1	0.000	0.000	0.000	0.647
2	0.613	0.376	0.366	0.515

Coefficients						
Model		Unstandardised	Standard Error	Standardised	t	p
1	(Intercept)	3.379	0.078		43.099	< .001
2	(Intercept)	4.538	0.194		23.385	< .001
	Ind14DCM	-0.412	0.065	-0.613	-6.304	< .001

Ind14DCM: Difficult class management