FACTORS AFFECTING ONLINE TEACHING OF PRIMARY SCHOOL TEACHERS IN THE NORTHERN MOUNTAINOUS REGION OF VIETNAM

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ABSTRACT

Online teaching is becoming more and more popular in the era of the fourth industrial revolution (the 4.0 era). The covid 19 pandemic has pushed online teaching to a higher level. Previously, online teaching mainly took place at the high school level, with the target audience being adults. Although there are many benefits of teaching online such as reducing travel costs and saving time and learning space, there are still difficulties and challenges, one of which is how to organize effective online teaching hours. The purpose of this study is to explore the factors affecting the online teaching of Vietnamese primary school teachers. The exploratory factor analysis method was used to study 160 Vietnamese primary school teachers. Six factors were found to affect teachers' online teaching including time management and time commitment, technical skills, attitudes toward online learning, expectations for online classes, interactions with colleagues and online feedback. These findings can be used as a reference in other research or in a comparable scenario by interested scholars. Educators can use these findings to advocate strategies that will provide a better education. This study suggests a direction for further research on proposing effective online teaching methods

KEYWORDS: factors, teacher, primary, online teaching.

INTRODUCTION

Learning in the 21st century needs to be focused on transforming the traditional teaching method into a new pedagogical approach to improve the quality of teaching and learning [1]. One of the teaching methods in the digital age is online teaching. Online teaching is increasingly widely practiced at many levels of education because of its outstanding advantages. Under certain conditions, the advantages of online education include some or all of the following: existing infrastructure that can be used to deliver the course; technology is cross-platform; access to servers and the Internet is widely

available with standard interfaces; online education can be flexible, accessible and convenient for students; can often save institutional costs and save time compared to traditional on-the-job education, and often have advantages for instructors such as easy updating and revision of courses. The advantages of e-learning include distance learning, comfort, and accessibility, but online learning is limited in its degree of inefficiency and difficulty in supervising students [2]. The flexibility and efficiency of online learning are at its heart, allowing students to access study materials easily and making them learner-oriented [2], [3]. With the proliferation and improvement of technical solutions for online teaching over the past two decades, there is an increasing amount of discussion, especially in the Anglo-American world, about the advantages and disadvantages of online courses in higher education.

E-learning teachers play an important role in the success or failure of the e-learning system. Their ability to design learning content in online teaching affects the quality of information presented, learning interaction, and student satisfaction during lectures. Teachers, as key users who play a vital role in the success of online learning, are required to have a strong willingness to deliver online learning content, as well as the ability to integrate technology for successful e-learning. In the context of the early stages of the Covid-19 pandemic, students around the world had to stay at home [4, 5]. All schools from universities to kindergartens and elementary schools must close [6]. However, students "stop going to school but don't stop learning" or "School's Out, But Class's On" [7-9]. Vietnam is a country in Southeast Asia that is no exception. The Ministry of Education and Training of Vietnam has implemented a measure to implement flexible adaptive teaching activities, which is to switch from face-to-face teaching to online teaching, with the motto: "don't leave any students behind".

In order to organize online teaching effectively, it is necessary to identify the factors affecting the online teaching process so that appropriate pedagogical measures can be taken. As such, there are a number of efforts have been made in conducting research on factors affecting online teaching as shown in Table 1.

Table 1 Factors influencing online teaching

Authors	Title	Factors Influencing online teaching
Bolliger and Wasilik [10]	Factors influencing faculty satisfaction with online teaching and learning in higher education. Distance education	1) student-related, 2) instructor-related, 3) institution-related
Cheawjindakarn et al. [11]	Critical Success Factors for Online Distance Learning in Higher Education: A Review of the Literature	1) institutional management 2) learning environment, 3) instructional design, 4) services support and 5) course evaluation

Hung and Jeng [12]	Factors influencing future educational technologists' intentions to participate in online teaching	1) attitude, 2) subjective norm, 3) perceived control 4) intention
Ventayen [13]	Teachers' readiness in online teaching environment: a case of the department of education teachers.	1) Technical Skills, 2) Experience with Online Teaching and Learning, 3) Attitudes toward Online Learning 4) Time Management and Time Commitment
Tandon [14]	Factors influencing adoption of online teaching by school teachers: A study during COVID-19 pandemic	1)Performance expectancy; 2)Effort expectancy 3)Facilitating conditions 4)Social influence 5)Behavioural intention 6)Attitude 7)Actual use
González-González et al. [15]	Implementation of E-Proctoring in Online Teaching: A Study about Motivational Factors	1) Quality management (QM), 2) available information (AI), 3) external conditioning (EC), 4) trust (T), 5) perceived compatibility (PC), 6) perceived usefulness (PU), 7) attitude (A) 8) intention (I).
Andarwulan et al. [16]	Elementary Teachers' Readiness toward the Online Learning Policy in the New Normal Era during COVID-19	(1) availability of learning content, (2) availability of technological devices, (3) proficiency to apply technology devices, (4) capabilities to purchase internet data packages, (5) availability of internet signals, (6) teachers' attitude toward online learning.
Soeselo et al.[17]	Lecturers' Readiness in Online Teaching During COVID-19 Pandemic	1) Course design, 2) Course communication, 3) Time management, 4) Technical competence.
Makawawa et al. [18]	Primary school teachers perception of technological pedagogical content knowledge in online learning due to Covid 19	1) Technology Knowledge 2) Pedagogical Knowledge (PK) 3) Content Knowledge (CK)

		4) Technology Pedagogical Knowledge (TPK)
		5) Technology Content Knowledge (TCK)
		6) Pedagogical Content Knowledge (PCK)
		7) Technology Pedagogical Content Knowledge (TPCK)

Evidences from prior research in Table 1 can be classified into the following categories highligting the factors affecting online learning:

- Facility-related factors: There are many technological challenges, such as problems loading documents, difficulty installing apps, poor Internet connection, login problems, voice, video is not audible, etc [11, 19-21].
- Technological skills factors: Teachers have to rapidly adopt technological-based teaching due to the sudden emergence of the COVID-19 pandemic [13, 17, 22]
- Teachers' readiness and attitudes: Teacher competence affects online teaching process [10, 15, 16, 19, 20, 23].
- Learner-related factors: Learner readiness also impacts teachers' online teaching [10, 11, 19, 23].
- Institution-related factors: [10, 11]
- Time management: [11, 13, 17, 24]
- Other researchers look at it more specifically by emphasizing Critical Success Factors (CSFs), defined as institutional management, learning environments, instructional design, service support, and assessment course prices [11].

However, the research focuses on high schools and colleges and universities, and there are few studies on online teaching of primary school teachers. The purpose of this study is to explore the factors affecting the online teaching of primary school teachers in Vietnam.

2. MATERIALS AND METHODS
2.1. Participants
The survey was created and sent to elementary school teachers, covering economically, culturally and socially diverse locations with cities, districts and rural mountainous towns through the application using social network channels (e.g., Facebook, Messenger) during the period from April 5, 2022 to May 30, 2022. The estimated number of survey participants is 200 people, the response rate is 83.5% (167 responses), the research team removed 7 invalid responses due to invalid responses.

The final total data for inclusion in the analysis was 160 (95.8%). Table 2 summarizes the data from the survey, the proportion of men accounted for 18.1%, while the proportion of women accounted for 81.9%. The living areas of the surveyed people related to online teaching are mainly concentrated in mountainous, remote and isolated areas (56.9%), followed by rural areas (25.6%), the rest are in the district (11.3%) and in the city center (6.3%).

Table 2 Demographic information of participants (N = 160)

Variable		Frequency	Percentage
Age	Under 29	51	31.9
	30 – 39	54	33.8
	40 – 49	48	30
	Above 50	7	4.3
Gender	Male	39	18.1
	Female	131	81.9
Experience (years)	1 – 3	120	75
	4 – 6	11	6.9
	7 – 10	7	4.4
	Over 10	22	13.7
Area of living	District	18	11.3
	City	10	6.3
	Rural area	41	25.6
	Mountainous	91	56.9

2.2. Survey instruments

After studying the questions used for the survey based on the research model [13], 35 questions were selected and included in the research by the authors as shown in Table 1.

Table 1 Questions used to survey participants (N = 35)

Q1	I have a computer with a suitable configuration for online teaching
Q2	I know how to find help for online teaching through the network environment
Q3	I have access to word processors or web browsers
Q4	My computer connects to the printer
Q5	I often receive emails from online courses?

Q6	I have a significant amount of time to access the internet (at least 45 minutes a day)
Q7	I own a personal internet service (with a dedicated network connection)
Q8	I have a private office at home or at school
Q9	I have a continuous period of online courses
Q10	I often interact with others by email or voice message
Q11	I always have someone by your side ready to provide technical support when using a computer or using software
Q12	I find it inconvenient to have to go to school 2-3 times a week to attend classes and topics
Q13	I am always excited to use a new application, software, technology
Q14	I am an independent and self-directed learner
Q15	I feel it is not necessary to teach in a traditional face-to-face environment
Q16	I find it more convenient to give written responses than verbally
Q17	I am proactive with tasks and always complete tasks ahead of time
Q18	I find written communication very effective and convenient
Q19	I believe that online teaching is as effective as face-to-face teaching in class
Q20	I believe that high-quality experiential learning does not necessarily involve direct interaction with students
Q21	I am confident to organize online teaching
Q22	I look forward to teaching online
Q23	I love to experience challenges in online teaching
Q24	My managers support and encourage online teaching

Q25	My managers have policies to support and invest in online teaching.
Q26	My colleagues support and share online teaching experiences with each other
Q27	I support student-student interaction in active teaching
Q28	I can manage my time well
Q29	I answer questions in chat box, students' messages when teaching online within 24 hours.
Q30	I can use a variety of teaching methods and techniques when teaching online
Q31	I can control my students well when I teach online
Q32	I encourage student interaction when teaching online
Q33	I can use student learning assessment to re-adjust my online teaching
Q34	I use technology to evaluate students' understanding and experiences
Q35	I can use information technology to create my own learning materials (different from textbooks)

A five-point Likert scale (1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Totally Agree) was used for each question

2.3. Data Analysis

The current research employed Exploratory Factor Analysis (EFA) for data analysis. EFA is a quantitative analysis method used to reduce a set of many interdependent measures into a smaller set of variables (called factors) but still retains most of the information content of the original set of variables [25]. It seeks to identify the underlying structure of a group of associated variables. EFA presupposes that each index in a collection of indices is a linear function of one or more common factors and a single factor. Common factors are hidden, unobservable variables that impact more than one indication in a collection of indicators. Unique factors are latent variables that are considered to effect just one indication from a group of indicators and do not account for indicator correlations [26]. Before performing EFA, the suitability of the measurement for the 35 survey items was evaluated through the use of descriptive statistics. In the table of descriptive statistics, the research team calculated the mean of all the answers and the standard deviation (SD) on each question. If the mean of a sentence was found to be close to 1 or 5, the team removed that answer from the table as it might

reduce the standard of correlation among the remaining items [27]. After this step, normality in the distribution was checked by testing for skewness and kurtosi. After the normality of the distribution was confirmed, exploratory factor analysis was carried out using SPSS 26 (Statistical Package for the Social Sciences) software.

3. RESULTS AND DISCUSSION

The exploratory factor analysis procedure begins with the collecting of eigenvalues for each factor. The Kaiser-Meyer-Olkin (KMO) scale was then used to assess the data's eligibility for factor analysis [28]. KMO ranges from 0 to 1, with levels more than 0.5 deemed adequate for EFA [29]. The Bartlett approach is used to determine whether the correlation between the questions is strong enough for the factor analysis to be statistically significant [25]. Further analyses will be carried out only if Bartlett's test is statistically significant (sig. 0.05).

Initially, 35 questions were proposed. After performing some testing procedures, four questions (Q5, Q12, Q25, Q27) were eliminated. As such, 31 items are eligible for exploratory factor analysis

Table 2 KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.887
Bartlett's Test of Sphericity	Approx. Chi-Square	2912.546
	df	465
	Sig.	.000

EFA was performed on 31 questions with Varimax rotation. The analysis results from SPSS software allow the research team to extract the characteristic value for each factor. The Kaiser-Meyer-Olkin measurement verified the adequacy of sampling for analysis with a value of 0.887 (see Table 2), which is 0.6 higher than suggested by Kaiser [30] and 0.5 by Kim [29].

Bartlett's test of sphericity gives the result $\chi2$ (465) = 2912.546, $\rho < 0.000$, indicating that the correlation between question items is large enough to conduct exploratory factor analysis.

3.1 Exploratory Factor Analysis

The data from Table 3 show that there are six main factors formed from 31 questions with an eigenvalue value greater than 1. In other words, these 31 questions contribute 65.236% of the importance of factors affecting to online teaching of primary school teachers, the rest is due to other factors. The percentages explained by each factor are: factor 1 (37.307%), factor 2 (8.071%), factor 3 (7.843%), factor 4 (4.533%), factor 5 (3.775) %) and factor 6 (3.708%).

Table 3 Eigenvalue, Total Variance Explained of factors
Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	11.565	37.307	37.307	11.565	37.307	37.307	5.049	16.286	16.286
2	2.502	8.071	45.378	2.502	8.071	45.378	3.739	12.061	28.347
3	2.431	7.843	53.220	2.431	7.843	53.220	3.547	11.440	39.787
4	1.405	4.533	57.754	1.405	4.533	57.754	3.402	10.974	50.761
5	1.170	3.775	61.529	1.170	3.775	61.529	2.393	7.720	58.482
6	1.149	3.708	65.236	1.149	3.708	65.236	2.094	6.755	65.236
7	.966	3.117	68.354						
8	.899	2.901	71.254						

Table 4 shows the loadings for each item belonging to a factor. The factor loadings provide a description of each factor and the structure in the set of variables. For interpretation purposes, factor loadings of .45 and higher will be considered significant with a sample size of 160 [25]. Using this factor loadings threshold, we can observe that all of the loadings are significant. Moreover, Table 4 reports that each of the variables has a significant loading on only one factor. Factor 1 has 7 variables, factor 2 includes 6 variables, factor 3 has 6 variables, factor 4 includes 6 variables, factor 5 has 4 variables and factor 6 contains 2 variables.

Table 4 Rotation Matrix

	Component					
	1	2	3	4	5	6
Q33	.806					
Q31	.804					
Q32	.789					
Q30	.739					

Q34	.701				
Q29	.584				
Q35	.509				
Q1		.741			
Q3		.726			
Q4		.647			
Q2		.642			
Q7		.629			
Q6		.585			
Q28			.749		
Q26			.704		
Q17			.683		
Q13			.593		
Q24			.548		
Q14			.521		
Q20				.781	
Q19				.766	
Q15				.619	
Q22				.553	
Q23				.472	
Q21				.454	
Q8					.717
Q11					.705
Q9					.618
Q10					.457

Q16						.764
Q18						.747

Each factor can be named based on variables with significant loadings as shown in Table 5

Table 5 Naming the factors

Factor 1. Time Management and Time Commitment		Loading
Q33	I can use student learning assessment to re-adjust my online teaching	.806
Q31	I can control my students well when I teach online	.804
Q32	I encourage student interaction when teaching online	.789
Q30	I can use a variety of teaching methods and techniques when teaching online	.739
Q34	I use technology to evaluate students' understanding and experiences	.701
Q29	I answer questions in chat box, students' messages when teaching online within 24 hours.	.584
Q35	I can use information technology to create my own learning materials (different from textbooks)	.509
Factor 2. Technical skills		
Q1	I have a computer with a suitable configuration for online teaching	.741
Q3	I have access to word processors or web browsers	.726
Q4	My computer connect to the printer	.647
Q2	I know how to find help for online teaching through the network environment	.642
Q2	I know how to find help for online teaching through the network environment	.629
Q6	I have a significant amount of time to access the internet (at least 45 minutes a day)	.585
Factor 3. Attitudes toward Online Learning		
Q28	I can manage my time well	.749

Q26	My colleagues support and share online teaching experiences with each other	.704
Q17	I am proactive with tasks and always complete tasks ahead of time	.683
Q13	I am always excited to use a new application, software, technology	.593
Q24	My managers support and encourage online teaching	.548
Q14	I am an independent and self-directed learner	.521
Factor 4. Expectations for online classes		
Q20	I believe that high-quality experiential learning does not necessarily involve direct interaction with students	.781
Q19	I believe that online teaching is as effective as face-to-face teaching in class	.766
Q15	I feel it is not necessary to teach in a traditional face-to-face environment	.619
Q22	I look forward to teaching online	.553
Q23	I love to experience challenges in online teaching	.472
Q21	I am confident to organize online teaching	.454
Factor 5. Interaction with colleagues		
Q8	I have a private office at home or at school	.717
Q11	I always have someone by your side ready to provide technical support when using a computer or using software	.705
Q9	I have a continuous period of online courses	.618
Q10	I often interact with others by email or voice message	.457
Factor 6. Online feedback		
Q16	I find it more convenient to give written responses than verbally	.764
Q18	I find written communication very effective and convenient	.747

3.2 Discussion and limitations

It is vital to study the aspects impacting online education in order for it to be not just a response to the existing crisis, coping with the covid-19 epidemic, but also a form of teaching in the future. Based on the factors extracted from the analysis, some recommendations are suggested as follows: First, schools

and instructors must be adaptable in designing teaching plans, producing curriculum, and implementing teaching techniques based on local conditions and pupils. Second, preparing digital technology equipment in order to completely equip facilities for online instruction. Third, efforts should be made to train and mentor instructors in the use of digital applications. And finally, collaboration between teachers, parents, and schools should be reinforced in order to improve procedures and morale.

This study encountered some limitations as follows: The first limitation relates to the analytical method. Exploratory factor analysis is a statistical method used to test the structural validity and psychometric properties of a set of measures. However, EFA is not a powerful enough tool to test the theoretical foundations, so the Confirmatory Factory Analysis method should be used in subsequent studies to check the theoretical background (test the set of measures that our model proposes (six factors)). The second limitation in this study is the bias in sample selection. The research team only sampled the teachers in the mountainous regions of Vietnam, so it greatly affects the generalizability of the research results. Scholars and managers need to consider carefully before applying the results of this research to their working environment. The third limitation is that the small sample size leads to a narrow generalization ability. The final limitation is that other factors are not considered for the analysis. There may be many important factors that directly affect teachers that have not been observed and measured, such as cultural and social factors.

4. CONCLUSION

This study aims to find out the factors affecting the effectiveness of online teaching of primary school teachers in mountainous areas of Vietnam. 35 questions were proposed based on prior studies and distributed to participants through social channels. Based on the evidence from 160 included subject and 31 refined questions, the results of exploratory factor analysis show that there are 6 main factors affecting online teaching of teachers including: time management and time commitment, technical skills, attitudes toward online learning, expectations for online classes, interactions with colleagues and online feedback. These findings can be used as a reference in other research or in a comparable scenario by interested scholars. Educators can use these findings to advocate strategies that will provide a better education.

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