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Data Descriptor

Data on Vietnamese Students' Acceptance of Using VCTs for Distance Learning during the COVID-19 Pandemic

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Abstract: The outbreak of COVID-19 at the beginning of 2020 has heavily influenced education all around the world. In Vietnam, educational institutes were suspended, and distance learning was conducted to ensure students' learning process, with distance learning occurring mainly via video conferencing tools (VTCs). The purpose of this paper is to provide data on Vietnamese students' acceptance of using VCTs in distance learning during the COVID-19 pandemic through an extended technology acceptance model (TAM) and structural equation modeling (SEM) method. This study used the TAM of Venkatesh and Davis. The questionnaire was designed based on Venkatesh and Davis and Salloum et al.'s scale. An online survey with snowball sampling was selected in April. The final dataset consisted of 277 valid records. This data descriptor presented descriptive statistics (mean, standard deviation), internal consistency (Cronbach's alpha), reliability and validity measures (composite reliability, average value extracted test), and factor loading of items of eight factors: output quality, computer playfulness, subjective norm, perceived usefulness, perceived ease of use, attitude towards to use, behavioral intention to use, and actual system to use. Results indicated that external factors such as subjective norm and computer playfulness had a significant impact on most TAM constructs. Furthermore, output quality was found to have a positive influence on students' perceived usefulness and acceptance of VCTs in distance learning.

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1. Summary

The COVID-19 pandemic, which has influenced 70% of the student population worldwide [1], has directly affected teaching and learning in Vietnam's higher education institutions (HEIs). Although educational institutions have been suspended, Vietnam's Ministry of Education and Training (MOET) declared a new motto: "no schooling but still learning" [2], and promoted distance learning—a means of providing access to education for geographically remote learners [3] via the Internet and television, among others—as a solution for both addressing the current situation resulting from the pandemic while also helping to transform education in general [4]. At the higher education level, the MOET officially granted students of HEIs the right to study at home [5], and they also formally requested HEIs to operate distance learning as a temporary plan during COVID-19 [6]. Along with

that, it was announced that the achievement academic of this training method will be officially recognized [7]. Thus, HEIs actively adapted information technology into distance learning. As a consequence, video conferencing tools (VCTs) (e.g., Zoom, Teams, Google Classroom, Facebook groups, etc.) have been widely used by Vietnams' HEIs during COVID-19 as a solution to ensure effective responses to the distance learning requirement. Although teaching and learning with VCTs have been proven effective by many researchers [8], it is not clear what benefits and challenges they bring to higher education in Vietnam, especially concerning students' acceptance of the use of technology in the time of unexpected events.

Due to COVID-19, the adoption of VCTs to teach and learn has become an urgent requirement for HEIs. Consequently, there is a need to study the use of VCTs, as well as their pros and cons, especially in relation to students' acceptance of the tools. This data was gathered to examine the factors that impact Vietnamese students' acceptance of the use of technology in distance learning during the COVID-19 pandemic through an extended technology acceptance model (TAM) and structural equation modeling (SEM) method. The data were collected over 10 days, from 14 April 2020, to 23 April 2020, and the research model and hypotheses were tested using the IBM SPSS Amos software version 23.

2. Data Description

The data comprises two main parts. The first part is the demographic information of respondents. The second part includes two major groups of variables that are related to the Vietnamese students' adoption of the use of VCTs in distance learning during the COVID-19 pandemic: (1) external factors group, including output quality (OQ), computer playfulness (CP), and subjective norm (SN); and (2) TAM constructs group, including perceived usefulness (PU), perceived ease of use (PEU), attitude toward to use (ATT), behavioral intention to use (BI), and actual system use (ASU). In the first part, we present respondents' demographic information, including three variables: the year in a HEI, area to access the internet, and VCTs for learning.

In the second part, the first two items required participants to respond to statements in order to measure the variable OQ: (OQ1) "The quality of the output I get from VCTs is high"; (OQ2) "I have no problem with the quality of VCTs' output". Items 6–8 present statements related to the variable CP: (CP1) "I feel that VCTs are enjoyable no matter what the usage purposes are"; (CP2) "I feel that VCTs help me to improve my creativity"; and (CP3) "I feel that I can have a variety of experiences without any interference". The next two items show statements related to the variable SN: (SN1) "I should have participated in the VCTs activities, as per my instructors"; (SN2) "I should have participated in the VCTs activities, according to other students".

The last seventeen items contained statements related to the TAM constructs as PU, PEU, ATT, BI, and ASU: (PU1) "VCTs enhance my learning performance"; (PU2) "My productivity is elevated through the utilization of VCTs in my study"; (PU3) "Using VCTs enhances my learning effectiveness; (PU4) "I find VCTs to be useful in my learning"; (PEU1) "I find it easy to get VCTs to do what I want them to do"; (PEU2) "VCTs are easy to use for me"; (PEU3) "Interacting with VCTs does not require a lot of my mental effort"; (PEU4) "My interaction with VCTs is clear and understandable"; (ATT1) "I feel positive regarding the utilization of VCTs"; (ATT2) "In general, I admire the utilization of VCTs"; (ATT3) "VCTs provide an attractive learning environment"; (BI1) "I will make use of VCTs regularly in the forthcoming time"; (BI2) "I intend to make use of functions of VCTs for providing assistance to my academic activities"; (BI3) "I will give out my recommendation to others to use VCTs"; (BI4) "I will use VCTs on a regular basis in the future"; (ASU1) "I use VCTs frequently"; and (ASU2) "I use the VCTs on a daily basis".

Responses from the measurement scale comprised answers using a five-point Likert type scale of 1–5, ranging from strongly disagree (1) to strongly agree (5). Raw data and the questionnaire are linked to Mendeley data source. The data was analyzed and then presented through three tables and one figure.

Table 1 shows the accuracy analysis statistics with reliability and validity measures. The reliability was measured by Cronbach's alpha and composite reliability (CR). Additionally, average value extracted (AVE) test was used to check on the validity of data [9]. From Table 1, it can be observed that all of the reliability values were higher than the recommended value of 0.7 [9], which shows levels of internal consistency. Table 2 presents respondents' demographic information, including their year in a HEI, area to access the internet, and VCTs used for learning. Table 3 shows all hypothesis testing, of which eleven hypotheses are supported by our empirical analysis of SEM; on the other hand, the other five hypotheses are not supported. Lastly, Figure 1 demonstrates the structural equation model, showing all of the proposed hypotheses.

Table 1. Measurement accuracy assessment. CR: composite reliability; AVE: average value extracted.

Variable	Scale Item		Cronbach's Alpha Value	CR	AVE	Factor Loadings
	Mean	***SD***				
Output Quality (OQ)			0.84	0.85	0.74	
OQ1	3.03	0.95				0.91
OQ2	3.04	1.08				0.81
Computer Playfulness (CP)			0.83	0.90	0.75	
CP1	3.13	0.88				0.91
CP2	2.94	0.91				0.84
CP3	3.04	0.91				0.83
Subjective Norm (SN)			0.87	0.88	0.78	
SN1	3.58	0.92				0.93
SN2	3.48	0.86				0.83
Perceived Usefulness (PU)			0.93	0.94	0.80	
PU1	2.81	0.99				0.89
PU2	2.80	0.99				0.93
PU3	2.75	0.97				0.91
PU4	3.07	0.93				0.84
Perceived Ease of Use (PEU)			0.86	0.88	0.64	
PEU1	3.19	0.87				0.78
PEU2	3.62	0.91				0.82
PEU3	3.31	1.00				0.76
PEU4	3.45	0.87				0.86
Attitude Towards to Use (ATT)			0.91	0.92	0.79	
ATT1	3.20	0.87				0.87
ATT2	2.97	0.95				0.90
ATT3	2.96	0.93				0.89
Behavioral Intention to Use (BI)			0.89	0.90	0.68	
BI1	3.23	0.95				0.80
BI2	3.34	0.89				0.85
BI3	3.20	0.90				0.80
BI4	3.10	0.91				0.86
Actual System Use (ASU)			0.82	0.85	0.75	
ASU1	3.11	0.97				0.99
ASU2	2.98	1.00				0.71

Table 2. Sample profile. HEI: higher education institution; VCT: video conferencing tool.

Variable	*N*	Percentage
Year in HEI	**277**	**100**
1	74	26.72
2	132	47.65
3	47	16.97
4	22	7.94
5	2	0.72
Area to access the internet	**277**	**100.00**
Rural	128	46.21
Urban	149	53.79
VCTs used for learning		
Zoom	156	56.32
Google Meet	224	80.87
Microsoft Teams	18	6.50
Others	28	10.11

Table 3. The structural equation model analysis.

Variable	Path Coefficient (β)	*t*	Hypotheses	Decision
Dependent Variable: PU				
SN	0.06	0.89	H1a	Not supported
OQ	0.43	6.34 ***	H2	Supported
PEU	0.21	2.92 **	H4a	Supported
Dependent Variable: PEU				
SN	0.40	6.18 ***	H1b	Supported
CP	0.40	6.26 ***	H3a	Supported
Dependent Variable: ATT				
SN	0.01	0.27	H1d	Not supported
CP	0.16	3.08 **	H3b	Supported
PEU	0.34	6.05 ***	H4b	Supported
PU	0.51	9.41 ***	H5a	Supported
Dependent Variable: BI				
SN	0.12	2.20 *	H1c	Supported
CP	0.33	4.75 ***	H3c	Supported
PEU	0.03	0.4	H4c	Not supported
PU	0.11	1.43	H5c	Not supported
ATT	0.33	2.93 **	H6	Supported
Dependent Variable: ASU				
PEU	−0.46	−0.73	H4d	Not supported
BI	0.78	10.78 ***	H7	Supported

Note: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

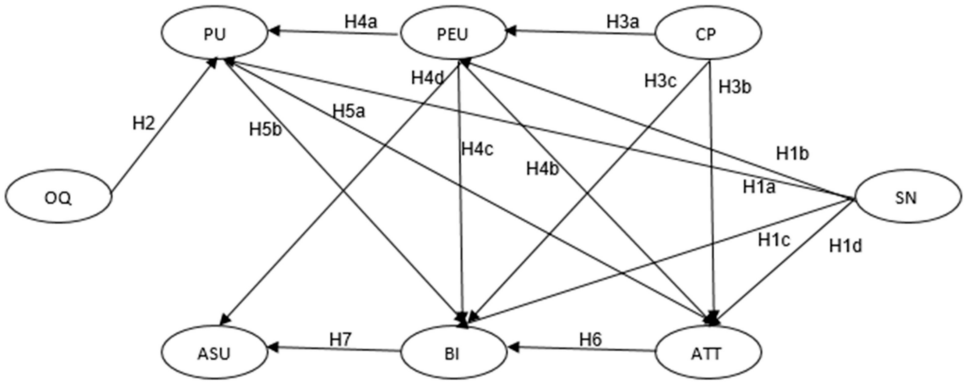

Figure 1. Structural model.

3. Methods

3.1. Participants

The participants of the research were students from universities in Hanoi who could not continue their traditional face-to-face learning at their school due to social distancing because of COVID-19. These students were encouraged to adopt the distance learning arranged by their institutions to avoid disruption to their education. With the exception of a few universities that had already designed their own distance learning systems, VCTs were used by the majority of students in other universities to connect with their teachers. There was no limitation to the background of students. They could have been from any faculty and academic year, used any type of device (desktops, laptops, smartphones, or tablets), been at any kind of location while learning (urban or rural), and used any form of VCT (Table 2).

3.2. Instruments

To explore the Vietnamese students' technology acceptance model of distance learning due to the novel coronavirus SARS-CoV-2 [10] through an extended TAM based on the original TAM [11], a quantitative approach was used to analyze the data. A scale was proposed based on the modification of Venkatesh and Davis (2000) [11] and Salloum et al. (2019) [12] to match our research purposes. The scales were designed to measure external factors and TAM constructs including subjective norm, output quality, computer playfulness, perceived ease of use, perceived usefulness, attitude toward using, behavioral intention to use, and actual system use (see Table 1). For all the measures, a five-point Likert type scale was used to measure all respondents' perceptions, ranging from strongly disagree (1) to strongly agree (5).

3.3. Data Collection

Concerning the data collection, an online survey method was considered to be the most suitable, especially during a period of social distancing. In the first step, a questionnaire was designed on Google Forms and was sent to the managerial staff and lecturers of different universities to make sure that the questions were simple enough for students to understand. Later, the questionnaire was adapted and sent directly to some students using the snowball sampling method via email and Facebook. The students who had completed the survey were encouraged to invite their peers who also used VCTs in distance learning to fill out the questionnaire. Data were collected in April 2020.

The initial set of data consisted of 294 records. Due to only providing a constant value for all of the responses, 17 records were excluded after examination. The final data set of 277 records was prepared through four phases, namely data editing, coding, capturing, and cleaning [13]. Finally, this data was analyzed with IBM SPSS Statistics software version 20. The characteristics of the respondents were shown in Table 2. An accuracy assessment with validity and reliability measures was presented in

Table 1. Hypotheses decisions were presented in Table 3, and the research model was demonstrated in Figure 1.

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References

1. United Nations Educational Scientific and Cultural Organization. Distance Learning Solutions. Available online: https://en.unesco.org/covid19/educationresponse/solutions (accessed on 14 March 2020).
2. Bao Dien Tu Chinh Phu Nuoc Cong Hoa Xa Hoi Chu Nghia Viet Nam. Bộ GD&ĐT hợp tác với UNICEF ứng phó với COVID-19. Available online: http://baochinhphu.vn/Hoat-dong-Bo-nganh/Bo-GDDT-hop-tac-voi-UNICEF-ung-pho-voi-COVID19/393433.vgp (accessed on 18 April 2020).
3. Moore, J.L.; Dickson-Deane, C.; Galyen, K. E-Learning, online learning, and distance learning environments: Are they the same? *Internet High. Educ.* **2018**, *14*, 129–135. [CrossRef]
4. Bao Dien Tu Nhan Dan. Cơ hội cho đại học Việt Nam đẩy nhanh chuyển đổi số, bắt kịp xu thế thế giới. Available online: https://nhandan.com.vn/dien-dan-giao-duc/co-hoi-cho-dai-hoc-viet-nam-day-nhanh-chuyen-doi-so-bat-kip-xu-the-the-gioi-454804/ (accessed on 9 April 2020).
5. Vietnam Ministry of Education and Training. Official Letter No. 988 / BGDĐT-GDTrH Dated 23/3/2020 about Ensure Quality of Distance Learning during the Prevention of the Covid-19 Pandemic. Available online: https://luatvietnam.vn/giao-duc/cong-van-988-bgddt-gddh-dam-bao-chat-luong-dao-tao-tu-xa-trong-thoi-gian-dich-covid-19-181791-d6.html (accessed on 24 March 2020).
6. Vietnam Ministry of Education and Training. Official Letter No. 795/BGDĐT-GDĐH Dated 13/3/2020 about the Implementation of Distance Learning in Response to Covid-19. Available online: https://moet.gov.vn/van-ban/vbdh/Pages/chi-tiet-van-ban.aspx?ItemID=2668 (accessed on 14 March 2020).
7. Thanh Nien. Nhiều trường đại học công nhận dạy học trực tuyến. Available online: https://thanhnien.vn/giao-duc/nhieu-truong-dai-hoc-cong-nhan-day-hoc-truc-tuyen-1196328.html (accessed on 16 March 2020).
8. Al-Samarraie, H. A scoping review of videoconferencing systems in higher education: Learning paradigms, opportunities, and challenges. *Int. Rev. Res. Open Distance Learn.* **2019**, *20*, 121–140. [CrossRef]
9. Hair, J.F.; Howard, M.C.; Nitzl, C. Assessing measurement model quality in PLS-SEM using con fi-rmatory composite analysis. *J. Bus. Res.* **2020**, *109*, 101–110. [CrossRef]
10. Gorbalenya, A.E.; Baker, S.C.; Baric, R.S.; De Groot, R.J.; Drosten, C.; Gulyaeva, A.A.; Haagmans, B.L.; Lauber, C.; Leontovich, A.M.; Neuman, B.W.; et al. Severe acute respiratory syndrome-related coronavirus: The species and its viruses—A statement of the Coronavirus Study Group. *bioRxiv* **2020**. [CrossRef]
11. Venkatesh, V.; Davis, F.D. Theoretical extension of the Technology Acceptance Model: Four longitudinal field studies. *Manag. Sci.* **2000**, *46*, 186–204. [CrossRef]
12. Salloum, S.A.; Alhamad, A.Q.M.; Al-Emran, M.; Monem, A.A.; Shaalan, K. Exploring students' acceptance of e-learning through the development of a comprehensive technology acceptance model. *IEEE Access* **2019**, *7*, 128445–128462. [CrossRef]
13. Hair, J.F.; Black, W.C.; Babin, B.J.; Anderson, R.E. *Multivariate Data Analysis*, 7th ed.; Prentice Hall: Upper Saddle River, NJ, USA, 2010.