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The Factors Affect the Online Learning Behaviour of Students

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Abstract
This article aims to analyze the factor affecting online learning (e-learning) of high-school and university students in Vietnam based on such models as the Theory of Reasoned Action (TRA – Fishbein & Ajzen, 1975); Theory of Planned Behavior (TPB - Ajzen, 1991); Technology Acceptance Model (TAM - Davis, 1989); C-TAM-TPB by Taylor and Todd (1995); and Unified Theory of Acceptance and Use of Technology (UTAUT) by Viswanath Venkatesh, Michael G. Moris, Gordon B. Davis, and Fred D (2003), and other related experimental studies. Based on the quantitative analysis results, it can be seen that among six factors that affect the online learning behavior of students, perceived behavioral control has the strongest impact, at 30.5%, the perceived ease of use affecting 28.7%, performance expectancy at 17.3% and facilitating conditions at 14.9%, social influence only at 12.3% and the risk of online learning harms students' behavior at -13.8%. By analyzing the advantages, disadvantages, and the degree of impact of factors affecting online learning behaviors, the research group makes some recommendations on applying a more effective online learning method, even after the Covid-19 pandemic is under control

Keywords: Determinants, E-Learning, Online Learning, Online Learning Behavior

1. Introduction

Amidst the Covid-19 pandemic and the increasing risk of coronavirus spread in the community, many educational institutions have switched to online learning during the virus outbreaks. In Vietnam, online learning has been implemented in some higher education institutions for many years. However, under the pressure of Covid-19 prevention measures, especially social distancing, the implementation of online learning in high schools and universities has grown significantly.

Hosting online classes for high-school or university students is widely recognized by many educational institutions. Online learning has become a trend, not only amidst the pandemic but the readiness to combine both online and offline training, even after the pandemic is under control. There are many advantages of online learning, as it can be considered a form of educational industrialization towards development. However, there are also certain drawbacks. In this research, the group looks into the factors that affect the online learning behavior of high school and university students in Vietnam. Then, the group determines the degree of each factor that affects the behaviors and makes recommendations on implementing online teaching and learning, even after the pandemic is under control.

2. Online learning amidst the Covid-19 pandemic

2.1. Definition of online learning

There are multiple definitions of online learning, but it can be simply understood as a method of distributing learning contents and documents by electronic devices such as smartphones, tablets, laptops, or computers via the Internet. From these, learning content can be accessed from the schools' websites or any other mobile applications. The instructors and the learners can exchange directly via applications like texting, email, forums, and webinars (Thuy, T., 2022). Online learning (or E-learning) is a learning method that uses network connections to aid in studying, obtaining documents, and communicating between the learners and the instructors (Hou, 2022). E-learning is a term that describes a method of studying and training based on information technology and communications (Trinh, V., 2012).

Circular No. 09/2021/TT-BGDDT dated March 30, 2021, by the Ministry of Education and Training promulgating the regulations on the management and organization of online teaching in higher education institutions and general educational institutions has been in effect since May 16, 2021. This Circular regulates the management and organization of online teaching of higher education programs, and continuing education programs at the junior high school and upper high school levels, including the organization of online teaching; technical infrastructure for online teaching, responsibilities of relevant agencies, and organizations and individuals. Therefore, for the first time, online teaching and learning have been stated in normative law. Circular No. 09/2021/TT-BGDDT is the legal corridor for online teaching and learning to be widely applied all over the country. Circular No. 09/2021/TT-BGDDT not only helps schools get ready to respond in any situation but also encourages and increases opportunities for students to learn anywhere, at any time.

2.2. Advantages and limitations of online learning

2.2.1. Advantages

Learning Anytime, anywhere: Students can easily access the course anywhere and anytime regardless of geographical distance, as long as there is the Internet. Saving costs of traveling, studying, and living: Students can save the costs of learning, living, save time for traveling around. Saving more learning time compared to the traditional one: Because of the flexible schedule, students can register and adjust the time, and the process of learning based on their competence, and they can further self-study through databases and references provided by the teachers and schools.

Technology platform availability: In Vietnam, the information technology system is developing significantly. The speed and capacity of the internet connection can fully guarantee the implementation of online teaching activities. The technology platform for online learning such as Google Meet, Microsoft Office, Zoom, etc. are already available and easily updated. With a good technology system, along with applications that can help students in tracking their progress and results easily, online learners can receive the quickest support from the teachers, departments, and schools.

2.2.2. Limitations

Poor interaction is when students with poor performance may not be willing to participate in classes. Online learning can hamper students' ability to exchange information and interact with teachers and friends. There may be problems with system connection, reducing the graphic and sound quality. Online learning limits the initiative and creativity of learners and limitations in practice. There may arise issues related to network security and intellectual property rights. Participants may encounter mental problems such as depression due to working with electronic devices for a long period, or physical health problems such as eye fatigue, tiredness, etc.

2.3. Trend and necessity of switching to online learning in the context of the Covid-19 pandemic

During complicated developments of the Covid-19 pandemic, online learning becomes more necessary, as it would keep the training activities from disruption. With many advantages, online learning steadily proves its relevance and the trend for future learning. Online learning has been carried out in many schools, showing its diversity and innovation in training methods. Specifically, amid Covid-19 outbreaks in multiple provinces in Vietnam, especially in big cities like Ha Noi, Ho Chi Minh City, etc., the implementation of this training method has proved its flexibility, consistency, and timely transition in organizing activities in many educational institutions.

Online learning in the 4th Industrial Revolution (Industry 4.0) period is becoming a trend of the new training program in Vietnam in particular, as well as in many countries across the world, not just as a solution to special circumstances such as Covid-19. Teaching and learning online is not just necessary and appropriate in the Covid-19 pandemic, but also the context of the 4th Industrial Revolution.

Ministry of Education and Training used to encourage the application of online teaching and learning, up to 30% of the schedule in 2016. Before the Covid-19 pandemic, most educational institutions were still resistant to the idea of applying technology in training and learning, and certificates for online students have not yet been appreciated. However, the Covid-19 pandemic has changed everything, and every student is taking online classes due to social distancing.

In mid-March 2020, Document No. 795/BGDDT-GDDH was issued to detail and guide the implementation of online learning and teaching for the education system towards information technology application with the basic standard quality. Then, at the end of March 2020, Document No. 988/BGDĐT-GDĐH was issued to make sure that the education system would evaluate online teaching via online examination, with quality processes.

According to the report in 2020, 79.7% of students in Vietnam were learning online. It is higher than the general average of OECD countries with a rate of 67.5%. In higher education levels, over 50% of educational institutions also applied online learning, in which many applied online teaching entirely, while some combined online and offline teaching. (Thuy, T., 2022)

Next, Circular No. 09/2021/TT-BGDDT, dated March 30, 2021, by the Ministry of Education and Training, stated regulations on organizing and teaching online in higher education institutions and general educational institutions, which have been in effect since May 16, 2021. Circular No. 09/2021/TT-BGDDT not only helps schools get ready to respond in any situation but also encourages and increases opportunities for students to learn anywhere, at any time.

According to many education experts, this is a big step in directing the policy that helps the education system in Vietnam to move from online teaching-learning to online teaching-learning-testing, based on the gradual completion of availability, technology, and implementation with expectations to ensure the quality of the entire system.

3. Overview of the Theory of Acceptance and Use of Technology model:

3.1.1. Theory of Reasoned Action (TRA)

Theory of Reasoned Action is studied under the perspective of social psychology to determine the elements of perceived behavior (Fishbein, M & Ajzen, I, 1975).

(1) The attitude of consumers towards the behavior. The attitude of each individual is measured by belief and the assessment of individual consumers towards the results of that behavior. When there is belief in the product, the consumers tend to promote the intention of using the company's products.

(2) The subjective norms of the consumers. Consumers are influenced by the attitude of the related people about the use of the product and the motive of the consumers towards conducting acts according to the desire of related people.

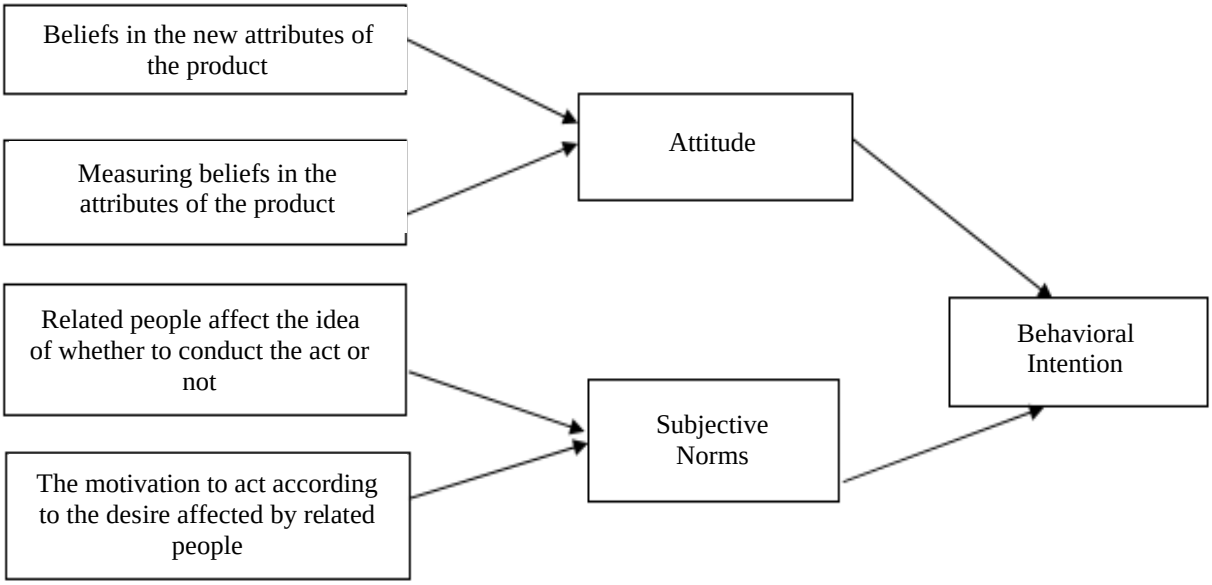

Figure 1: Theory of Reasoned Action
Source: Fishbein, M & Ajzen, I (1975)

3.1.2. Theory of Planned Behavior (TPB)

Theory of Planned Behavior by Ajzen, I (1991), was constructed from the original Theory of Reasoned Action model (TRA), along with additional perceived behavioral control factors, which affect the behavioral intention of the consumers.

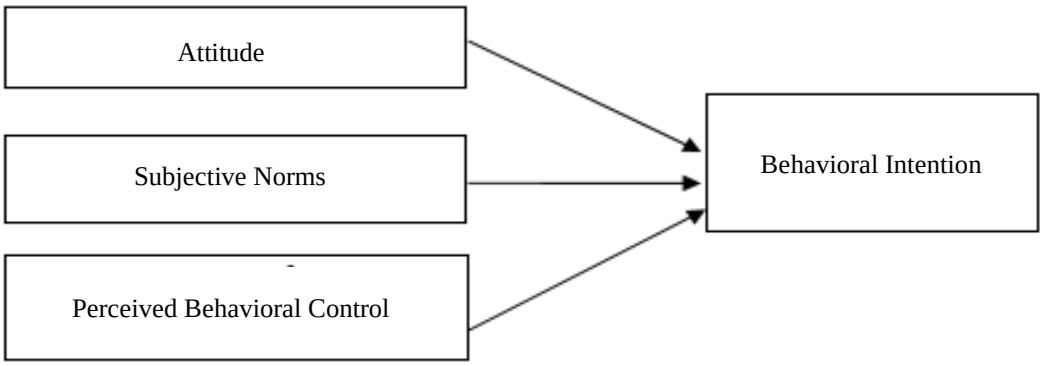

Figure 2: Theory of Planned Behavior
Source: Ajzen, I (1991)

3.1.3. Technology Acceptance Model (TAM):

Technology Acceptance Model (TAM) developed by Davis in 1989 presented the extent to which a person is willing to try, to make an effort in using new technology. The decision to use the technology depends on the intention of using it.

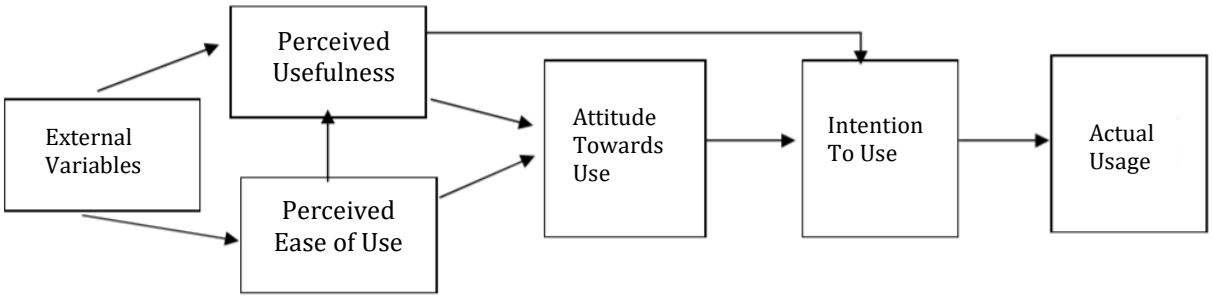

Figure 3: Technology Acceptance Model
Source: David, F.D (1989)

The intention of using a technology depends on the attitude of the user to the technology. The attitude of the user depends on 2 factors: (1) The perceived usefulness of the technology; and (2) The perceived ease of use of the technology.

3.1.4. C-TAM-TPB Model

Taylor, S & Todd, P (1995) inherited the TAM model, and by combining it with the TPB model by Ajzen (1991), they studied two additional factors, namely subjective norms and perceived behavioral control.

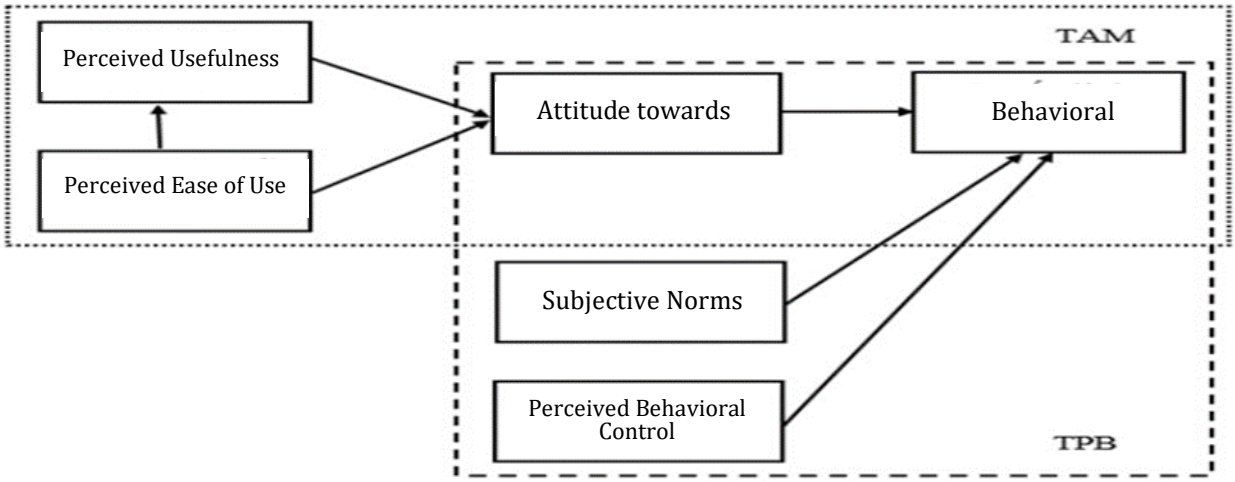

Figure 4: C-TAM-TPB Model
Source: Taylor, S & Todd, P (1995)

(1) Subjective Norms are *"the perception of the individual about the social pressure whether to perform a behavior or not."* When the individual perceived higher social expectations of behavior, he/she tends to follow the expectations of society and act accordingly. The results of the research by Hartwick, J., & Barki, H. (1994) confirmed the relation between subjective norms and the intention to use the system.
(2) Perceived Behavioral Control is the perception of an individual on the ease to perform a behavior (related to the availability of necessary resources, knowledge, and opportunities to apply the technology).

3.1.5. Unified Theory of Acceptance and Use of Technology (UTAUT)

The UTAUT model was built by Viswanath Venkatesh, Michael G. Moris, Gordon B. Davis, and Fred D. Davis (2003) based on eight models/theories, including the Theory of Reasoned Action (TRA - Ajzen & Fishbein, 1975),

Theory of Planned Behavior (TPB - Ajzen, 1991), Technology Acceptance Model (TAM - Davis, 1989), Model of Motivation (MM – F. D. Davis, R. P. Bagozzi, & P. R. Warshaw (1989), Combined Model of TAM and TPB (C - TAM - TPB - Taylor & Todd, 1995), Model of Personal Computer Utilization (MPCU - Thompson, Higgins & Howell, 1991), Innovation Diffusion Theory (IDT - Moore & Benbasat, 1991), Social Cognitive Theory (SCT - Compeau, D. R., & Higgins, C. A., 1995).

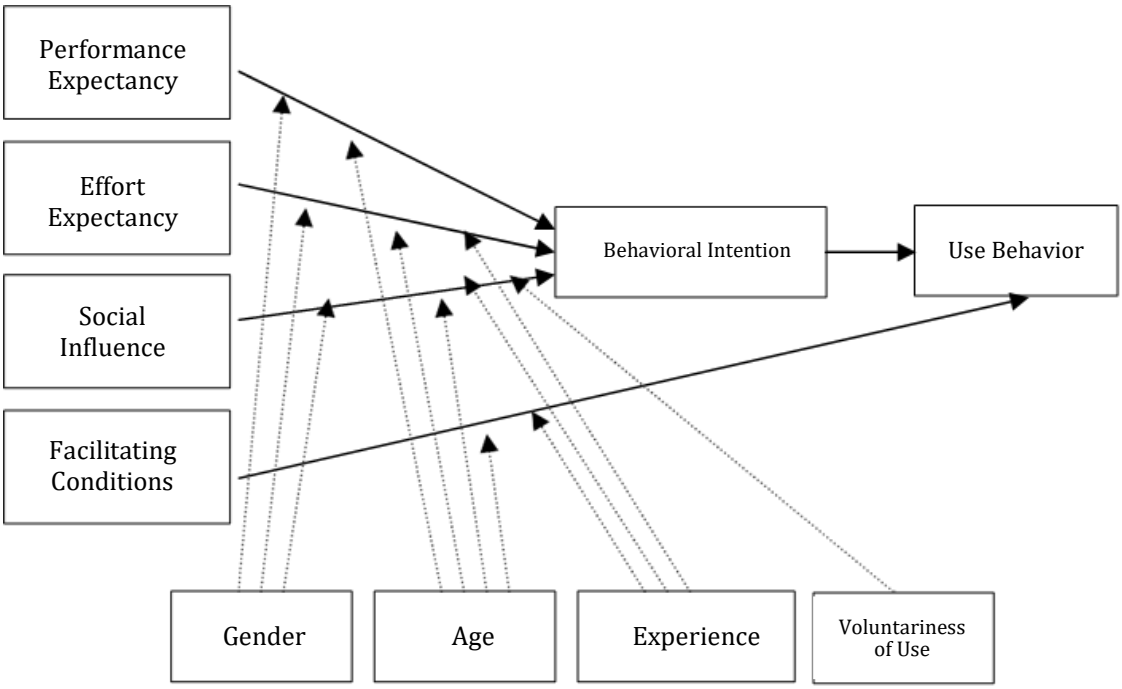

Figure 5: Consolidated models of acceptance and use of technology
Source: Viswanath Venkatesh, Michael G. Moris, Gordon B. Davis, and Fred D (2003)

Performance Expectancy: The degree to which an individual believes that using the system will help him or her to attain gains in job performance
Effort Expectancy: The degree of ease associated with the use of the system
Social Influence: The degree to which an individual perceives that important others believe he or she should use the new system.
Facilitating Conditions: The degree to which an individual believes that an organization's technical infrastructure exists to support the use of the system.
Intermediary elements: Gender, age, experience, and voluntariness of use indirectly affect the behavioral intention through the major factors.

4. Determinants of online learning behavior of students

4.1. Research models

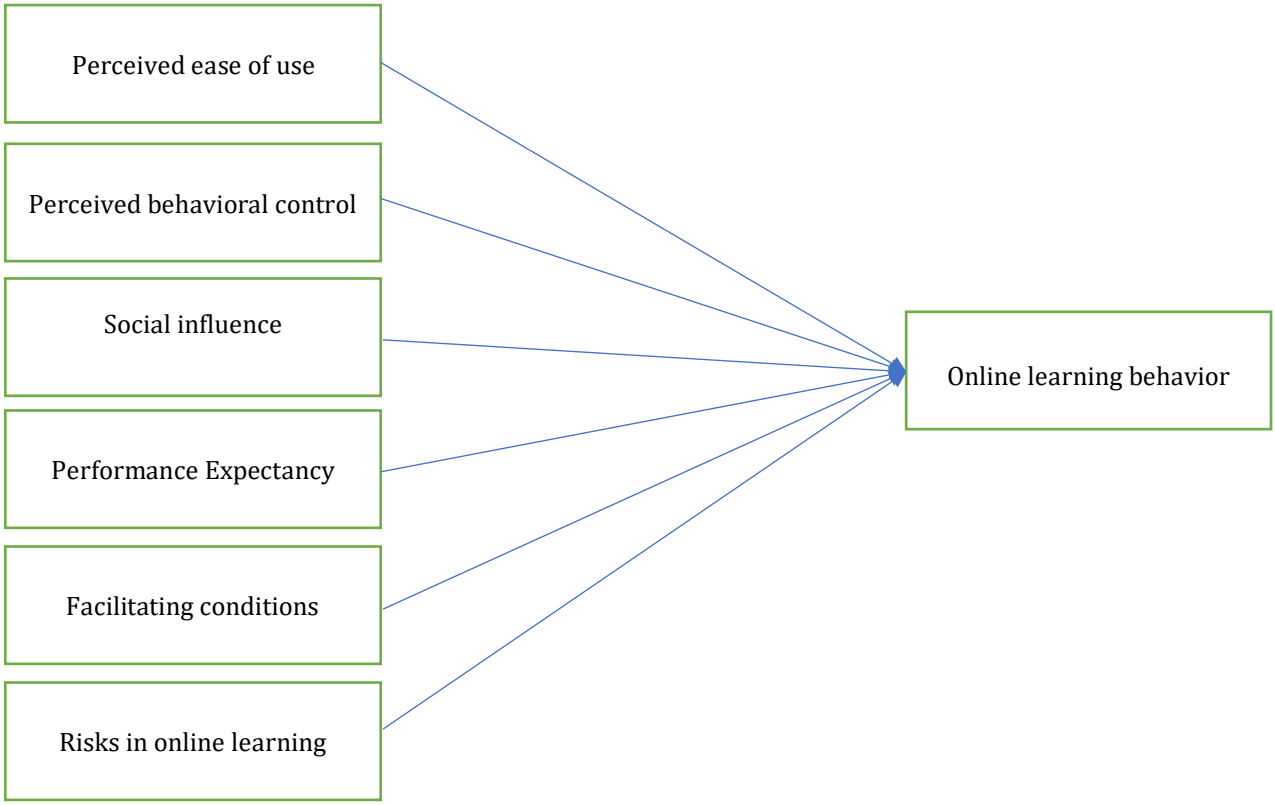

Figure 6: Proposed model

Source: Proposed by researchers

4.2. Hypotheses and research scales

4.2.1. Research hypotheses

Hypothesis H1: Perceived ease of use has a positive impact on online learning behavior
Hypothesis H2: Perceived behavioral control has a positive impact on online learning behavior
Hypothesis H3: Social influence has a positive impact on online learning behavior
Hypothesis H4: Performance expectancy has a positive impact on online learning behavior.
Hypothesis H5: Facilitating conditions have a positive impact on online learning behavior
Hypothesis H6: Risks in online learning harm online learning behavior

4.2.2. Variables and research scales:

Table 1: Basis of variables and scale in the model

Code	Observable variables	Source
1. Perceived ease of use		
TEU1	You learn how to use online learning software easily	*David (1989); Taylor & Todd (1995);* Venkantesh & Davis, (2000); Tan & Teo (2000)
TEU2	The implementation of the online learning software is simple and easy to understand.	
TEU3	You can easily master the use of online learning software.	
TEU4	The process of implementing the online learning software is clear and easy to understand	
TEU5	You can easily control the tasks when using online learning software.	
2. Perceived behavioral control		

TBC1	You have the necessary resources for online learning	*Ajzen (1991); Taylor and Todd (1995);* Shih & Fang (2004); Shi (2004)
TBC2	You are equipped with knowledge about the software used for online learning	
TBC 3	You can switch to online learning	
TBC4	Online learning is scheduled in the institution's training plans in the context of the Covid-19 pandemic	
TBC5	You are ready to use the online learning assistance software	
3. Social influence		
TIE1	Online learning is attributed to social distancing in the context of the Covid-19 pandemic	*Viswanath Venkatesh, Michael G. Moris, Gordon B. Davis, and Fred D (2003);*Venkatesh & Davis (2000)
TIE2	Online learning is conducted to meet the requirements of the schools and society in the context of the Covid-19 pandemic	
TIE3	Online learning is conducted to fit the needs and desires of students in the context of the Covid-19 pandemic	
TIE4	Online learning is conducted because others are learning online	
4. Performance Expectancy		
TPE1	Online learning will help ensure distancing in the context of the Covid-19 pandemic	*Viswanath Venkatesh, Michael G. Moris, Gordon B. Davis, and Fred D (2003)*
TPE2	Online learning will help connect the school and students to ensure academic progress	
TPE3	Online learning help reduce traveling, studying, and living expenses	
TPE4	Online learning can be performed anytime, anywhere (time optimization)	
TPE5	In general, online learning can be seen as useful and convenient in the context of the Covid-19 pandemic	
5. Facilitating conditions		
TBI1	Technology platforms for online learning such as Google Meet, Microsoft Office, Zoom, etc. are quite available	*Viswanath Venkatesh, Michael G. Moris, Gordon B. Davis, and Fred D (2003)*
TBI2	Information is transferred with high speed and unlimited backup	
TBI3	The school has sufficient resources needed to organize online learning	
TBI4	It is easy to access digital platforms	
6. Risks in online learning		
TRD1	Online learning increases the interaction and exchanges between teachers and students	Pikkarainen (2004). Chen and Lu (2002); Tan & Teo (2000)
TRD2	Online learning increases the interaction and exchanges among students	
TRD3	Ease to acquire knowledge in all the subjects when learning online	
TRD4	Confidence in connection and the security of the online learning software	
7. Online learning behavior		
TD1	You are willing to switch to online learning when requested	*David, 1989; Taylor and Todd (1995); Viswanath Venkatesh, Michael G. Moris, Gordon B. Davis, and Fred D (2003)*
TD2	You are willing to switch to online learning in the context of the Covid-19 pandemic	
TD3	You are willing to switch to online learning even when the pandemic is controlled	
	You desire to switch to online learning further	

Source: Synthesis of the researchers

5. Data collection and analysis

To study the factors affecting online learning behavior, the research team reviewed the theories as follows: *Theory of Reasoned Action (TRA - Ajzen & Fishbein, 1975); Theory of Planned Behavior (TPB - Ajzen, 1991); Technology Acceptance Model (TAM - David, 1989); C-TAM-TPB Model of Taylor and Todd (1995); and Unified Theory of Acceptance and Use of Technology of Viswanath Venkatesh, Michael G. Moris, Gordon B. Davis, and Fred D (2003)* regarding some factors identified from the research of Venkantesh & Davis, (2000); Tan & Teo (2000); Shih & Fang (2004); Shi (2004); Pikkarainen (2004). Chen and Lu (2002). Thereby the authors determine and group the factors into 1. Perceived ease of use; 2. Perceived behavioral control; 3. Social influence; 4. Performance expectancy; 5. Facilitating conditions; 6. Risks in online learning; and the dependent variable 7. Online learning behavior.

The survey is designed for high school students and university students in Vietnam, the researchers used a Likert 5-point scale, with 1. Strongly disagree; 2. Disagree; 3. Neutral; 4. Agree; 5. Strongly agree. After the construction of the survey, the in-depth interviews are conducted with 5 experienced teachers who have worked in education for many years, 3 high school students, and 3 university students. After finishing the survey according to the suggestions of the respondents, the interview results showed most of the comments agreed with the factors, so the research team surveyed on a larger scale.

Data is collected based on such methods as convenient sampling and snowball techniques to find the next subjects based on the reference or the introduction of survey subjects, and survey subjects are high school students and university students in Vietnam. After conducting the survey, collected data is aggregated and analyzed by Excel and SPSS.

6. Actual impact of the factors on online learning behavior in the context of the Covid-19 pandemic

6.1. Statistic description

The number of questionnaires that researchers collect and put into the model is 525 high school students (42.24%) and 718 university students (57.76%), the total of two groups of participants in the survey is 1,243 people.

Table 2: Research sample Statistics

	Number (people)	Percentage (%)
High school students	525	42.24
University students	718	57.76
Total	**1243**	**100,0**

Source: Survey results

The research sample focuses on students in high school and university, as these are the two groups that can be self-disciplined and active in learning and acquiring knowledge.

6.2. Data analysis

6.2.1. Assessing the quality and reliability of the scale

Results of scale testing by Cronbach's Alpha show the coefficients are all greater than 0.7 *(Table 3)*, All the observed variables have Corrected item-total Correlation greater than 0.3. It shows that the research is consistent and highly reliable. In seven groups of factors with the number of original observations Xm = 31 variables, no variable is removed, and the number of observed variables put into the model is Xk = 31 variables.

Table 3: Results of Cronbach's Alpha

Scales	Number of observed variables			Cronbach's Alpha
	Before testing	After testing	Observable variables excluded from the scales	
Perceived ease of use	5	5	No	0.874
Perceived behavioral control	5	5	No	0.868
Social influence	4	4	No	0.818
Performance expectancy	5	5	No	0.854
Facilitating conditions	4	4	No	0.834
Risks in online learning	4	4	No	0.842
Online learning behavior	4	4	No	0.823
Total	31	31	No	

Source: Testing results

6.2.2. Exploratory Factor Analysis

EFA analysis results, at Eigenvalues = 1.127 > 1 in the sixth factor, so six factors extracted from EFA can best explain observed variables.

Total variance explained: Extraction Sums of Squared Loadings (Cumulative %) = 66.647% > 50 %. This proves that 66.647% variability of the data is explained by six factors.

Table 4: Rotated Component Matrix

	Component					
	1	2	3	4	5	6
CN4	.758					
CN3	.749					
CN2	.737					
CN5	.729					
CN1	.705					
NT1		.756				
NT3		.744				
NT2		.722				
NT4		.713				
NT5		.638				
HQ5			.759			
HQ3			.758			
HQ4			.753			
HQ1			.731			
HQ2			.591			
RR2				.835		
RR1				.818		
RR3				.816		
RR4				.808		
ĐK2					.768	
ĐK3					.756	
ĐK1					.728	
ĐK4					.722	

XH1						.778
XH2						.748
XH3						.733
XH4						.611

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 6 iterations.

Source: Testing results

With the dependent variable:

Table 5: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.763
Bartlett's Test of Sphericity	Approx. Chi-Square	1814.486
	df	6
	Sig.	.000

Source: Testing results

KMO = 0.763 > 0.5 so factor analysis is appropriate. Sig. (Bartlett's Test) = 0.000 (sig. < 0.05) proved the observed variables are correlated with each other.

Table 6: Total Variance Explained

Initial Eigenvalues			Extraction Sums of Squared Loadings		
Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
2.618	65.439	65.439	2.618	65.439	65.439
.632	15.803	81.242			
.405	10.121	91.363			
.345	8.637	100.000			

Extraction Method: Principal Component Analysis.

Source: Model results

Results of matrix rotation show that one factor is extracted from the observed variables in the EFA analysis. Variance Explained is 65.439% at eigenvalue 2.618> 1.

Table 7: Component Matrix

	Component
	1
HV4	.820
HV1	.815
HV3	.802
HV2	.799

Extraction Method: Principal Component Analysis.
a. 1 component extracted.

Source: Testing results

6.2.3. Correlation and regression analysis

Table 8: Correlations

		HV	ĐK	CN	NT	RR	HQ	XH
HV	Pearson Correlation	1	.544**	.681**	.677**	-.108**	.571**	.570**
	Sig. (2-tailed)		.000	.000	.000	.000	.000	.000
	N	1243	1243	1243	1243	1243	1243	1243

ĐK	Pearson Correlation	.544**	1	.428**	.419**	.006	.524**	.442**
	Sig. (2-tailed)	.000		.000	.000	.830	.000	.000
	N	1243	1243	1243	1243	1243	1243	1243
CN	Pearson Correlation	.681**	.428**	1	.621**	-.003	.444**	.511**
	Sig. (2-tailed)	.000	.000		.000	.909	.000	.000
	N	1243	1243	1243	1243	1243	1243	1243
NT	Pearson Correlation	.677**	.419**	.621**	1	.093**	.483**	.486**
	Sig. (2-tailed)	.000	.000	.000		.001	.000	.000
	N	1243	1243	1243	1243	1243	1243	1243
RR	Pearson Correlation	-.108**	.006	-.003	.093**	1	.061*	-.075**
	Sig. (2-tailed)	.000	.830	.909	.001		.030	.008
	N	1243	1243	1243	1243	1243	1243	1243
HQ	Pearson Correlation	.571**	.524**	.444**	.483**	.061*	1	.434**
	Sig. (2-tailed)	.000	.000	.000	.000	.030		.000
	N	1243	1243	1243	1243	1243	1243	1243
XH	Pearson Correlation	.570**	.442**	.511**	.486**	-.075**	.434**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.008	.000	
	N	1243	1243	1243	1243	1243	1243	1243

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Source: Testing results

The results show that all the values of Pearson sig correlation between the independent variables and dependent variables are less than 0.05. Therefore, the independent variables are linearly correlated with the dependent variable.

6.3. Regression analysis

Table 9: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	296.878	6	49.480	412.414	.000[b]
	Residual	148.290	1236	.120		
	Total	445.168	1242			

a. Dependent Variable: HV

b. Predictors: (Constant), XH, RR, ĐK, NT, HQ, CN

Source: Testing results

Sig F = 0.00 < 0.05, so regression model is significant.

Table 10: Model Summary

Model	R	R Square	Adjusted R Square	Std. The error in the Estimate	Durbin-Watson
1	.817[a]	.667	.665	.34638	2.013

a. Predictors: (Constant), XH, RR, ĐK, NT, HQ, CN

b. Dependent Variable: HV

Source: Testing results

Adjusted R-squared is 0.665 = 66.5%. Thus, the independent variables in the regression affect 66.5% of the change of the dependent variable.

Table 11: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	.777	.072		10.839	.000		
	DK	.118	.016	.149	7.321	.000	.647	1.546
	CN	.219	.017	.287	12.790	.000	.537	1.862
	NT	.221	.016	.305	13.533	.000	.529	1.890
	RR	-.101	.012	-.138	-8.253	.000	.967	1.034
	HQ	.130	.016	.173	8.272	.000	.617	1.622
	XH	.100	.017	.123	5.949	.000	.629	1.590

a. Dependent Variable: HV

Source: Testing results

With standardized coefficients Beta, the linear regression equation evaluates the impact of six elements and is formulated as follows:

HV=0.149 DK+0.287 CN+0.305 NT-0.138 RR+0.173 HQ+0.123 XH

Data in the linear regression equation shows that provided other factors are constant if facilitating conditions (DK) increase by 1 unit, online learning behavior increases by 0.149 unit; if perceived ease of use (CN) increases by 1 unit, online learning behavior increases 0.287 unit; if perceived behavioral control (NT) increases by 1 unit, online learning behavior increases 0.305 unit; if risks (RR) increases by 1 unit, online learning behavior down 0.138 unit; if performance expectancy (HQ) increases by 1 unit, online learning behavior increases by 0.173 unit; if social influence (XH) increases by 1 unit, online learning behavior increases by 0.123 unit. Thus, all the hypotheses H1, H2, H3, H4, H5, and H6 are accepted.

6.4. Testing the difference between high school students and university students

To test the differences in online learning behavior between high school students and university students, the research team uses the Independent Samples Test. Test results are specified in Table 12

Table 12: Testing the difference in online learning behavior between high school students and university students

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
HV	Equal variances assumed	4.375	.037	9.935	1241	.000	.32887	.03310	.26393	.39381
	Equal variances not assumed			9.807	1072.528	.000	.32887	.03354	.26307	.39468

Source: Testing results

Results of Independent Samples Test, in Levene's Test, Sig = 0.037 < 0.05 shows the different variance between the two objects, so Sig of T-test at the Equal variances not assumed can be used. At that value, Sig = 0.00 < 0.05,

it can be concluded that there are statistically significant differences in online learning behavior between high school students and university students.

7. Discussion and recommendations

The results of the quantitative analysis show that among six factors that impact online learning behavior, perceived behavioral control has the largest impact with 30.5%, next is perceived ease of use with the impact of 28.7%, performance expectancy with 17.3%, facilitating conditions with 14.9%, and social influence with 12.3%. Risks in online learning harm online learning behavior with an impact of -13.8%.

During the Covid-19 pandemic, society realized the importance of online learning methods. Teaching and learning online will be the perfect solution to the connection between people and knowledge in any crisis (war, epidemic, or climate change crisis). Due to the impacts of the Covid-19 pandemic, "online learning" is gradually becoming more popular than ever from general education to higher education as well as many other training programs. This is like a "revolution," in the education methods to comprehensively change the study habits and shape a new look for the future.

Due to the Covid-19 pandemic, learners have to adapt and prepare all necessary resources and knowledge, and institutions should also have adjusted training plans. Online learning can be cost-saving, and efficient for both students and parents. Students can learn English, solve complex problems, review the lesson in class, prepare new lessons, etc. online through interaction with the teacher in intuitive and vivid videos.

To have an effective online learning environment, it is necessary to ensure adequate conditions for online teaching and learning with the coordination between the schools, teachers, students, and parents. It can then meet the trend of the digital age, and create facilitating conditions for learning anytime, anywhere while solutions to teaching and learning online have developed rapidly. They do not only satisfy the short-term needs but also present a sustainable connection in the future.

Within the article, the research team suggests some recommendations on effectively applying online learning, even when the Covid-19 pandemic is under control.

Perceived behavioral control and perceived ease of use have the largest impact among six factors. They are closely related to resources and the perception of students. Therefore, families and students should actively dedicate the necessary resources to online learning to purchase equipment, software, and knowledge on the software, which helps students aware of the ability to control technology and ease of technology use, then switch to online learning more quickly.

Facilitating conditions for online learning has a quite strong impact, so the government should create favorable conditions for the development of the technology platform for online learning such as Google Meet, Microsoft Office, Zoom, etc. to be able to transfer information with high-speed and unlimited backup. High schools and universities should utilize the necessary resources to provide technologies for the online learning organization.

It is advisable to strengthen communication about the positive effects of digital transformation, and the application of technology in teaching and learning online; especially the usefulness and convenience in the context of the Covid-19 pandemic, and even after the pandemic is controlled. From that, it is possible to conduct online learning in high schools, colleges, and universities as a combined solution with offline in the context of the controlled pandemic.

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