



Acceptance and Use of Cloud-Based Virtual Platforms by Higher Education Vocational School Students: Application of the UTAUT Model with a PLS-SEM Approach

Aceptación y uso de plataformas virtuales basada en la nube por estudiantes de educación superior de escuelas profesionales: aplicación del modelo UTAUT con enfoque PLS-SEM

RECEIVED 22/10/2022 ACCEPTED 13/02/2022 PUBLISHED 01/12/2023

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ABSTRACT

Cloud-based virtual platforms emerged as a new way of tracking lectures as mobile, reliable, and productive. Especially due to the COVID-19 breakdown, they became popular because checking the students' effort, performance, social interaction among each other, and the condition of vocational schools was easy to track during and after the online classes. The research aims to analyze the behavioral intention to adopt cloud-based virtual platforms such as Blackboard, Microsoft, Zoom, Edmodo, Sakai and Moodle during COVID-19. 14 questions were asked to 313 students from higher education vocational schools in the district of Izmir, Turkey via Google Forms. PLS-SEM analyses were made by SmartPLS 4.0 software and by proposing the Unified theory of acceptance and use of technology (UTAUT) theory. The results showed that the variance of effort expectancy, behavioral intention, and facilitating conditions explained 76.00% of the proposed model. The research contributes to understanding the students' behavior toward the acceptance of cloud-based virtual platforms in case of new variants or other epidemic diseases emerged in the future.

KEYWORDS Cloud-based virtual platforms; PLS-SEM; UTAUT theory; COVID-19; Higher education vocational students.

RESUMEN

Las plataformas de aprendizaje basadas en la nube surgieron como una nueva forma portable, confiable y productiva de hacer un seguimiento a clases y conferencias. Particularmente debido al impacto del COVID-19, se convirtieron en herramientas populares debido a su facilidad para monitorear el esfuerzo de los estudiantes, su rendimiento, así como su interacción social durante y después de las clases. La investigación tiene como objetivo analizar la intención de comportamiento de adoptar plataformas virtuales basadas en la nube como Blackboard, Microsoft, Zoom, Edmodo, Sakai y Moodle durante COVID-19. Se hicieron 14 preguntas a 313 estudiantes de escuelas vocacionales de educación superior en el distrito de Izmir, Turquía a través de Google Forms. Análisis PLS-SEM se realizaron mediante el software SmartPLS 4.0 proponiendo la teoría unificada de aceptación y uso de tecnología (UTAUT). Los resultados mostraron que la varianza de la expectativa de esfuerzo, la intención de comportamiento, y las condiciones facilitadoras explicaron el 75,40% del modelo propuesto. La investigación permite comprender el comportamiento de los estudiantes hacia la aceptación de plataformas de aprendizaje basadas en la nube en caso de que surjan nuevas variantes u otras enfermedades epidémicas en el futuro.

PALABRAS CLAVE Plataformas virtuales basadas en la nube; PLS-SEM; teoría UTAUT; COVID-19; Estudiantes de formación profesional de educación superior.

1. INTRODUCTION

The COVID-19 lockdown has temporarily switched the education system from face-to-face to virtual instruction (Torrás, 2021; Vásquez *et al.*, 2023). The first occurrence was reported in Wuhan, China, on February 22nd, 2020, and the first case was discovered in Turkey on March 11th, 2020 (Republic of Turkey Ministry of Health, 2020). The Turkish government has implemented stringent regulations in relation to higher education, with peak instances beginning in the middle of 2021. For safety reasons, the spring 2019–2020 term and the fall 2020–2021 term were launched online (Bautista *et al.*, 2022). According to the council of higher education (2021), the institutions had the authority to choose whether students would receive their education remotely, virtually, or in person, depending on whether the region was under threat. The requirement of the vaccine for students, academics, and administrative personnel also shaped the educational atmosphere (the council of higher education, 2021). Since the COVID-19 epidemic began to spread in July 2022, it was necessary to make research to determine how cloud-based learning platforms would be used effectively if students were online away from college.

The UTAUT is a significant theory for examining people's intentions regarding the acceptance and use of technology (Venkatesh *et al.*, 2003). Several studies have successfully used UTAUT in understanding the technology acceptance and use across various technologies, containing AI integrated CRM systems (Chatterjee *et al.*, 2021), document management systems (Ayaz, & Yanartas, 2020), eWallet (Bommer *et al.*, 2022), accounting information systems (Lutfi, 2022), online technology (Chayomchai *et al.*, 2020), e-commerce (Chan *et al.*, 2021), open online courses (Li, & Zhao, 2021), internet banking services (Al-Fahim *et al.*, 2021), smart city (Popova, & Zagulova, 2022), digital technology (Akinnuwesi *et al.*, 2022), online knowledge paying behavior (Yu *et al.*, 2021), mobile payments (Ariffin *et al.*, 2020; Namahoot & Jantasri, 2022; Nur, & Gosal, 2021), mobile health or ehealth applications (Magsamen-Conrad *et al.*, 2019; Semiz, & Semiz, 2021), ERP systems (Thottoli, & Thomas, 2022), e-government (Zeebaree *et al.*, 2022), streaming media (Limna *et al.*, 2022) and online learning (Ahmed *et al.*, 2022; Alvi, 2021; Alwahaishi, 2021; Jameel *et al.*, 2022; Marandu *et al.*, 2022; Sabayleh *et al.*, 2020; Şimşek, & Ateş, 2022; Sukarya *et al.*, 2020; Tussardi *et al.*, 2021), m-learning (Alyoussef, 2021; Ikhsan *et al.*, 2021). However, the COVID-19 period has seen a limited number of studies on behavioral intentions to use cloud-based learning platforms, and the majority of the extant research has focused on a four-year higher education (Adanir & Cinar, 2011; Batucan *et al.*, 2022; Serttas, & Kasabali, 2020). The dearth of research in the literature today makes it even more important to examine the influences of effort expectancy, behavioral intentions, and facilitating conditions on the adoption of cloud-based learning platforms during the COVID-19 period in the two-year higher education program context.

In light of this, it is intended to study students' behavioral intentions with regard to using cloud-based learning platforms during COVID-19 from vocational school and comprehend what are hurdles of cloud-based learning platforms adoption usage using UTAUT theory. The following are covered under the research questions: What are the factors that influence vocational school students' intentions to use cloud-based virtual platforms? How did performance expectations and social influence affect their behavioral intentions? How did effort expectations, behavioral intentions, and performance expectations interact with one another?

This study will contribute to the educational institutions taking the required actions and creating user-friendly features to make preferable virtual learning platforms and guide their students in using

cloud-based virtual platforms during COVID-19. The details of materials and methods to address the aim of this study are given in the next section.

2. MATERIAL AND METHOD

The research primarily proposes a UTAUT theory to understand how cloud-based virtual platforms are used and accepted, which are Blackboard, Microsoft, Zoom, Edmodo, Sakai and Moodle. In order to comprehend the behavioral intentions of higher education students at vocational schools, the quantitative study methodology was used. Table 1 displays the five demographic questions that were developed to profile the universities' cloud based virtual platform usage of for higher education.

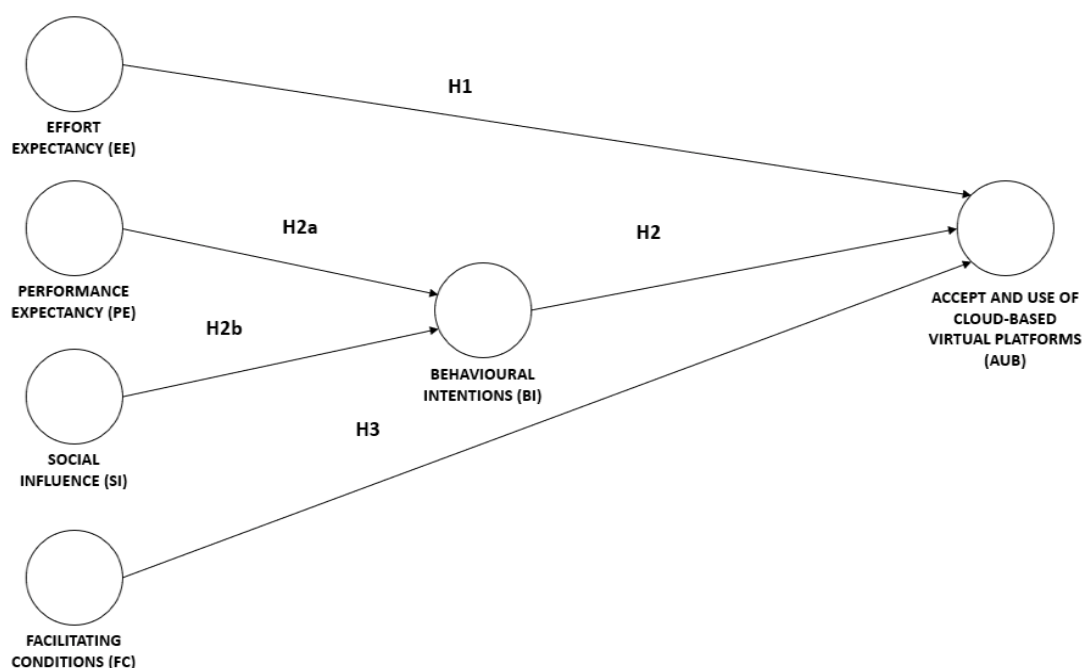
TABLE 1. Descriptive statistics for the participants.

GENDER	FREQUENCIES	RATIOS
Male	136	43.5
Female	177	56.5
AGE INTERVAL		
18-19	90	28.8
20-21	99	31.6
22-23	32	10.2
24-25	21	6.7
25 and above	71	22.7
COURSE		
Graphic design	29	9.3
Civil Technology	24	7.7
Occupational health and safety	30	9.6
Civil air transportation and management	71	22.7
Medical documentation and secretarial	36	11.5
Applied English and translation	25	8.0
Landscape Architecture	98	31.2
CLOUD-BASED LEARNING PLATFORMS USE		
Once a month	25	8.0
Twice a month	28	8.9
Several times a day	115	36.7
Once a week	119	38.0
Never	26	8.4
CLOUD-BASED LEARNING PLATFORMS TOOL USE		
Blackboard	116	37.1
Microsoft	47	15.0
Zoom	72	23.0
Edmodo	21	6.7
Sakai	31	9.9
Moodle	26	8.3

2.1. Design and data collection

The UTAUT investigates people's effort, performance, social influence, facilitating conditions regarding behavioral intention, and the user behavior of technologies. This model was used because this was the only mixture theory of combined psychological and sociological studies, measuring acceptance and use of disruptive technologies and including the combined technology acceptance model (TAM) for social cognitive theory (SCT) towards cloud-based virtual platforms acceptance and use during COVID-19. The unique feature of the UTAUT theory discovered was that it was successful in explaining students' spontaneous and instantaneous actions toward cloud-based virtual platforms during COVID-19 by measuring the impact of effort expectancy directly on technology adoption and use. In this study, the UTAUT was applied by obtaining Effort expectancy (EE), Performance expectancy (PE), Social influence (SI), Facilitating condition (FC), Behavioural intention (BI), and Use behavior (UB), as the hypothesis illustrated in Fig 1. EE (H1) served to examine perceived ease of use and complexity. PE and SI were applied to analyze perceived usefulness and subjective norms, respectively, as H2a and H2b. FC (H3) was also examined to seek perceived behavioral control and compatibility.

FIGURE 1. The Research Model.



2.2. Participants

In the present study, an online survey was administered to 313 vocational higher education students in the spring of 2021/between mid-March and mid-April 2021, during the partial lockdown, and lockdown.

2.3. Instrument and hypothesis

The students' use and acceptance intention to adopt cloud-based virtual platforms were evaluated using a 5-point Likert scale from 1 (totally disagree) to 5 (totally agree). Six constructs and fifteen items were used in the structural model, and accept and use of cloud-based virtual platforms were used and accepted as a dependent variable, which had 2 items. There are 5 independent variables: Effort expectancy (EE), Performance expectancy (PE), Social influence (SI), Facilitating condition (FC), and Behavioural intention (BI), each of which has 4, 3, 2, and 3 items, respectively. Assessments were made in accordance with the hypothesis put forth as the study's starting premise after the results were elicited.

H1. Effort expectancy (EE) has a positive impact on the acceptance and use (AUB) of cloud-based virtual platforms.

H2. Behavioral intention (BI) has a positive impact on the acceptance and use (AUB) of cloud-based virtual platforms.

H2a. Performance expectancy (PE) has a positive impact on behavioral intention (BI) to adopt cloud-based virtual platforms.

H2b. Social influence (SI) has a positive impact on behavioral intention (BI) to adopt cloud-based virtual platforms.

H3. Facilitating conditions (FC) has a positive impact on the acceptance and use (AUB) of cloud-based virtual platforms.

2.4. Data analysis procedures and techniques

To create a structural model for the research domains, 15 questions were applied to SmartPLS 4.0 for six factors. The structural model was examined using confirmatory factor analysis (CFA). To test the theory, structural equation modeling (SEM) was applied. Standard Loadings, Cronbach's Alpha, Composite reliability (CR), Average variances extracted (AVE), and Variance inflation factor (VIF) were acquired to check the validity and reliability of data items. The Fornell-Larcker criterion and cross loadings analysis were formed to check the discriminant validity among constructs. After ensuring the reliability and validity, the structural model assessment was exhibited to assess the model's effect, explanatory and predictive power. The structural model was formed, deriving from the UTAUT theory to test the hypothesis.

3. RESULTS

Six constructs were used to create the UTAUT theory: EE, PE, SI, FC, BI, and AUB. The Items were also illustrated in Appendix 1. The section was divided into two subsections: Reliability and Validity, and Model Evaluation.

3.1. Reliability and Validity

SRMR value for the structural model was 0.080, which MacCallum *et al.* (1996) noted was a significant fit for the range of 0.08 to 0.10. Nunnally and Bernstein (1994) stated that all Cronbach's Alpha values of the EE, PE, SI, FC, BI, and AUB ranging from 0.635 to 0.956, which is more than 0.6, were considered fit. According to Hair *et al.* (2017), all AVE values should be more than 0.5 and were all valid. According to Hair *et al.* (2010), the threshold of value was 0.7, and all CR values were fit. Table 2 shows that EE has four components, with a CR of 0.925, and an AVE of 0.755. PE consists of three items with a CR of 0.944, and an AVE of 0.849. SI has 2 items with a CR of 0.845, and AVE of 0.732. FC has two items holding with a CR of 0.854, and an AVE of 0.745. BI has three elements, with factor loadings ranging from 0.950 to 0.967, a CR of 0.971, and an AVE of 0.919. AUB has 2 components with a CR of 0.893, and an AVE of 0.807. According to Hair (1995), the VIF value, which was below 10, was acceptable. It was shown in Table 2 that all items have no multicollinearity issues.

TABLE 2. Items, Cronbach's Alpha, Composite reliability (CR), Average variances extracted (AVE) and Variance Inflation Factors (VIF).

UTAUT Variables	Indicators	Cronbach's Alpha	CR	AVE	VIF
EE (Item 1-3)	EE1				2.804
	EE2	0.891	0.925	0.755	1.761
	EE3				3.532
	EE4				3.211
PE (Item 4-6)	PE1				2.749
	PE2	0.911	0.944	0.849	4.245
	PE3				3.144
SI (Item 7-8)	SI1				1.277
	SI2	0.635	0.845	0.732	1.277
FC (Item 9-10)	FC1				1.319
	FC2	0.659	0.854	0.745	1.319
BI (Item 11-13)	BI1				5.939
	BI2	0.956	0.971	0.919	6.898
	BI3				4.821
AUB (Item 14-15)	AUB1	0.762	0.893	0.807	1.608
Model Fit SRMR Value (0.080)	AUB2				1.608

The distinctness and uniqueness of the construct were evaluated using the Fornier-Lacker criterion, as proposed by Hair *et al.* (2017), in this work. Every latent variable should have an AVE square root that is higher than other latent variable correlation coefficients (Fornell, & Lacker, 1981). In Table 3, EE, PE, SI, FC, BI, and AUB consist of four, three, two, two, three, two components, with standardized factor loadings, ranging from 0.771 to 0.910, 0.902 to 0.913, 0.838 to 0.873, 0.841 to 0.885, 0.950 to 0.967, and 0.888 to 0.909, respectively. According to Hair *et al.* (2010), all factor loadings should be more than 0.7, which all were satisfied. Additionally, it was observed that the cross-loadings for each construct are low, indicating strong discriminant validity. The discriminant validity assessments' valid Fornell-Larcker criterion and cross-loading results

were shown in Table 3. The structural model was assessed in the next section when it was determined that the construct measurements were accurate and valid.

TABLE 3. Discriminant Validity Measurement through Fornell-Larcker Criterion and Cross-loadings.

UTAUT Constructs	EE	PE	SI	FC	BI	AUB	Discriminant Validity
Fornell-Larcker Criterion							
EE	0.867						Valid
PE	0.753	0.921					Valid
SI	0.689	0.646	0.856				Valid
FC	0.677	0.632	0.702	0.863			Valid
BI	0.572	0.600	0.632	0.680	0.959		Valid
AUB	0.718	0.679	0.709	0.750	0.798	0.896	Valid
Cross-Loadings							
EE1	0.887	0.663	0.585	0.610	0.421	0.590	Valid
EE2	0.771	0.602	0.644	0.544	0.324	0.538	Valid
EE3	0.910	0.676	0.562	0.591	0.561	0.674	Valid
EE4	0.900	0.681	0.641	0.639	0.602	0.696	Valid
PE1	0.741	0.902	0.567	0.578	0.542	0.622	Valid
PE2	0.681	0.948	0.588	0.613	0.573	0.625	Valid
PE3	0.667	0.913	0.632	0.572	0.543	0.645	Valid
SI1	0.726	0.599	0.838	0.689	0.509	0.714	Valid
SI2	0.481	0.513	0.873	0.548	0.570	0.523	Valid
FC1	0.533	0.512	0.524	0.841	0.627	0.605	Valid
FC2	0.646	0.586	0.703	0.885	0.543	0.702	Valid
BI1	0.515	0.551	0.609	0.650	0.958	0.739	Valid
BI2	0.549	0.603	0.616	0.658	0.967	0.761	Valid
BI3	0.547	0.572	0.592	0.627	0.950	0.757	Valid
AUB1	0.711	0.633	0.674	0.693	0.579	0.888	Valid
AUB2	0.597	0.598	0.615	0.674	0.819	0.909	Valid

3.2. Model Evaluation

The model was assessed by obtaining f2 (effect size of the model), Q2 (predictive relevance), and R2 (coefficient of determination), path coefficients, and T-values.

As Table 4 illustrated, The effect size (f square) of the model was defined as large, which was above 0.35, medium, which was above 0.15, and small was above 0.02. (Cohen, 1988). Every hypothesis has separate values: the effect of BI on AUB (H2) was 0.436 (large); the effect of EE on AUB (H1) was 0.191 (medium); the effect of SI on BI (H2b) was 0.190 (medium); the effect of PE on BI (H2a) was 0.118 (small). The predictive relevance (Q square) of the model was described as 0.02, 0.15, 0.32 for weak moderate, and strong (Hair *et al.*,

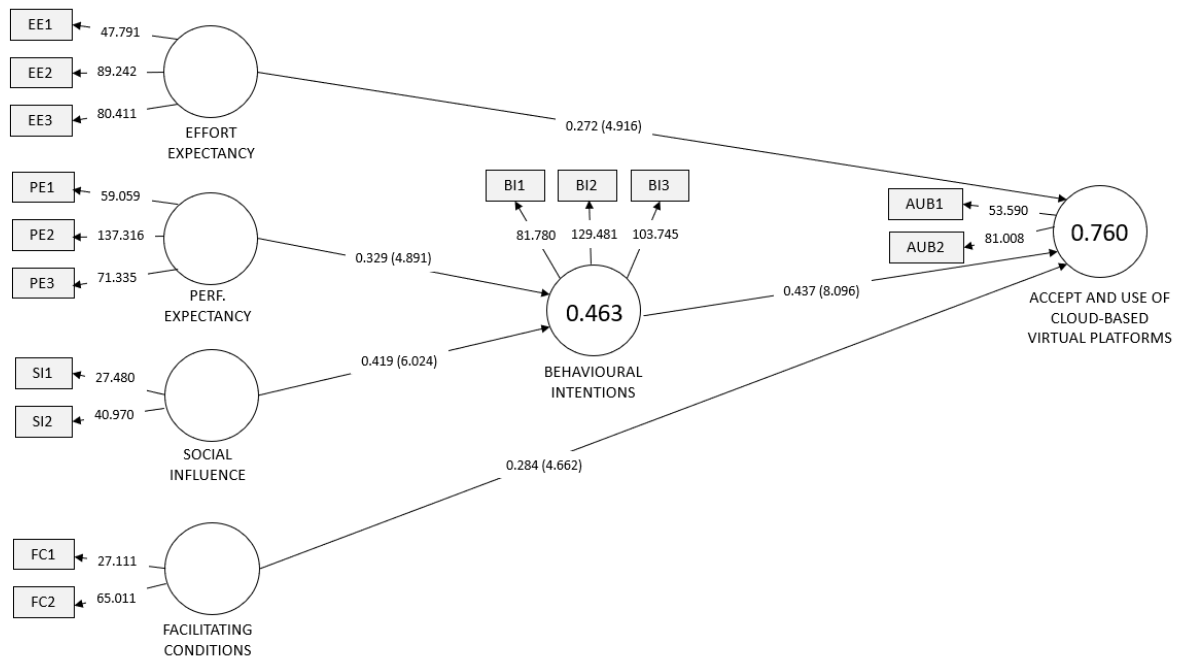
2010). The influence of both EE on AUB (H1) and PE on BI (H2a) hypotheses were strong with 0.670, and 0.450, respectively.

TABLE 4. Structural model's effect, explanatory, and results.

Hypothesises	f ²	Q ²	T-Values	Results	p Value
H1: EE->AUB	0.191	0.670	5.302	SUPPORTED	0.000 (***)
H2: BI ->AUB	0.436		7.510	SUPPORTED	0.000 (***)
H2a: PE->BI	0.118	0.450	4.404	SUPPORTED	0.000 (***)
H2b: SI->BI	0.190		8.559	SUPPORTED	0.000 (***)
H3: FC->AUB	0.110		5.723	SUPPORTED	0.000 (***)

As shown in Figure 1, path coefficients of effort expectancy and acceptance and use of cloud-based virtual platforms (H1), behavioral intention and acceptance and use of cloud-based virtual platforms (H2), performance expectancy and behavioral intention (H2a), social influence and behavioral intention (H2b), and facilitating conditions and accept and use of cloud-based virtual platforms (H3) were 0.272, 0.437, 0.329, 0.419, and 0.284 with the T-value of 4.916, 8.096, 4.891, 6.024, and 4.662, respectively. The hypotheses were supported as T-value exceeds 1.96 (Hair *et al.*, 2010). As understood from explained variable as variance (R square), the variance of PE and SI explained 46.30% of BI of cloud-based learning platforms. The results exhibited that the variance of EE, BI, and FC explained 76.00% of the variance of AUB.

FIGURE 2. The structural model with Path Coefficients, T- values and R square.



4. DISCUSSION

By utilizing cloud-based learning platforms like Blackboard, Microsoft, Zoom, Edmodo, and Sakai, education has transitioned from traditional classroom instruction to online instruction. According to Kacan and Gelen (2020), 50% of institutions have chosen to adopt Moodle as a platform for conducting business. Blackboard is the platform of choice in Turkish higher education, according to Ozbay (2015). Additionally, the UZEM platform was extensively used for history and e-MBA programs, according to Kirkan and Kalelioglu (2017). According to Kacan and Gelen (2020), 15% of Turkish universities have created their software. Izmir Katip Celebi University, Ataturk University, Bilecik Seyh Edebali University, and Dokuz Eylul University, respectively, produced the software known as Canvas, ALU, SOFRA, and DEOYS. This demonstrated how the research and development division became creative to sustain education.

The council of higher education (2021) emphasized that the entire class will continue to engage in hybrid learning based on COVID-19 commission regulations and COVID-19 cases. By using the council of higher education's guide, the government has continued to specify the standardized learning ecosystem policy for instruction using cloud-based learning platforms. (1) It protects students' rights by allowing university registration to be frozen, according to the council of higher education's instructions. (2) The flexibility of the online and in-person absence policies for students has encouraged them to pursue excellent education continuity. (3) To prevent confusion in class, the syllabus and course material should be made known to the students in advance. As a result, the council of higher education has sponsored both traditional and online higher education in Turkey.

Later, from March 2020 till today, understanding the actual use of cloud-based learning platforms has become significant. It can be inferred that effort expectancy (EE) was not correlated with behavioral intention but was correlated with the acceptance and use (AUB) of cloud-based learning platforms, as the online classes emerged swiftly, the ease of use of online learning during the COVID19 outbreak was not as important as the system usefulness at the first stage.

From effort expectancy —the acceptance and use (AUB) hypothesis (H1), as the students from the vocational school have applied classes, white blackboard extensions by Rahmadi (2021) and discussion forums by El Said (2021) were required with the file sharing and access feature for involving lab classes as two-way communications (Cavus, & Zabadi, 2014). It led the vocational school students to increase the perceived ease of use and decrease the complexity of accepting and using cloud-based learning platforms. From facilitating condition —the acceptance and use (AUB) hypothesis (H3), microlearning mentioned by Sozmen *et al.* (2021) was established for lecturers and students from vocational schools to share their experiences and keep track of students' behavior for finding an effective human-friendly interface. Based on the feedback, the systems were upgraded by the IT help desk (van Houwelingen *et al.*, 2018). It caused the vocational school students to increase their perceived behavioral control and the compatibility for accepting and using of system. From performance expectancy (PE) —the behavioral intention (BI) hypothesis (H2a), learning centers and the IT help desk worked collaboratively for contacting students and lecturers There is an urgent contact for students' critical issues such as missing attending midterm and final exams on time. They also accompany lecturers to conduct online classes, video services, and real-time chatting declared by Karadag *et al.* (2021) for increasing productivity during and after classes. It induced the vocational school students to increase the efficiency

of students' behavioral intentions to adopt cloud-based learning platforms. From the social influence(SI)-behavioral intention (BI) hypothesis (H2b) lecturers conducted demo quizzes and virtual gamification classes by Sukarya *et al.* (2020) for students to acknowledge the systems' use. It led the vocational school students to increase their awareness of students for behavioral intentions to adopt cloud-based learning platforms. From behavioral intention –the acceptance and use (AUB) hypothesis (H2) Most students have experienced using distance learning previously. Bozkurt (2017) stated that Anadolu University started open university education in 1993, Firat University began remote certified programs in 1995, and Bilkent University held a video conference system education portal for lecturing from the US. They led the vocational school students to understand the subjective norms of accepting and using cloud-based learning platforms.

This research aims to investigate the behavioral intention of the acceptance and use of cloud-based learning platforms in the COVID-19 period to increase the quality of two-year higher education programs for vocational school students and build them ease of use and usability system by applying the UTAUT model. The indicators of UTAUT are performance expectancy and social influence which explained 46.3% of the variance of the behavioral intention of cloud-based learning platforms. Hence, this UTAUT model was constructed to indicate that effort expectancy, behavioral intentions and social influences are three important critical constructs for the actual acceptance and use of cloud-based learning platforms, which explained 75.4% of actual acceptance and use of cloud-based learning platforms. In this section, the results obtained will not be shown again, but the most outstanding ones will be highlighted based on citations from similar studies that complement those obtained.

5. CONCLUSIONS

Education was changed drastically in the spring term of 2020 during the pandemic by using cloud-based learning platforms. From that time to two years, as the new variants appeared, knowing the use and acceptance of cloud-based learning platforms from the perception of vocational school students is significant to preserving the education standards.

The study monitored the acceptance and use of cloud-based learning platforms tools by using a UTAUT theory, which was Effort expectancy (EE), Performance expectancy (PE), Social influence (SI), Facilitating condition (FC), Behavioural intention (BI), Use behavior (UB). The model provides vocational school students' intentions for educational policymakers. Universities should especially create a communal learning platform manual for sharing their obstacles and hindrances over cloud-based learning platforms. Virtual learning centers for universities should also create student-oriented procedures for preparing manuals of the applied lectures. In addition, IT helpdesks should follow students' behaviors by examining the system's ease of user feedback for the classes and informing the board of universities' executives to reduce the troubles. Lecturers should be taken as feedback to answer students' instant requests to pervert the sufferer.

The research contributes to universities' cloud-based learning platform providers by adopting the UTAUT model to how students have a perceived acceptance and use of cloud-based learning platforms. This will aid the students in avoiding unprecedented system issues in future pandemics.

5.1. Limitations and future lines of research

Despite the fact that the suggested approach has significant consequences for both students and higher education institutions, some drawbacks were discovered. First, different results will be obtained when the study is implemented in other places and time periods. The second step is to include students taking diverse courses in vocational schools, such as applied English translation, architectural restoration, foreign trade and tourism, and hotel management, to obtain the various samples. Third, the UTAUT model may be used in conjunction with other theories to create HOT-fit models that help us understand the technological, organizational, and human factors that influence the adoption of cloud based learning management adoption.

6. FUNDING

The research, writing, and/or publication of this work were all done without any financial assistance from the authors.

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APPENDIX 1. QUESTIONNAIRE DESIGN

- EE1: I have a clear and intelligible engagement with the cloud-based virtual platforms offered by my university.
- EE2: I find it simple to learn how to use the cloud-based virtual platforms that my university offers.
- EE3: I find using the cloud-based virtual platforms offered by my university to be simple.
- EE4: I find it simple to understand how to use the cloud-based virtual platforms my university offers.
- PE1: My institution's cloud-based virtual platforms are helpful for my education, in my opinion.
- PE2: My productivity increases when I use the cloud-based virtual platforms offered by my university.

- PE3:** My institution's cloud-based virtual platforms improve my chances of receiving a high grade.
- SI1:** My institution's professors have been helpful in utilizing the cloud-based virtual platforms that they offer.
- SI2:** My institution's cloud-based virtual platforms are recommended by people who matter to me.
- FC1:** I possess the tools required to utilize cloud-based virtual platforms.
- FC2:** Help in using cloud-based virtual platforms is available from a particular person or group.
- BI1:** I'm planning to use the offered cloud-based virtual platforms in the upcoming semester.
- BI2:** I anticipate use the offered cloud-based virtual platforms over the upcoming semester.
- BI3:** I intend to make use of the offered cloud-based virtual platforms throughout the upcoming semester.
- AUB1:** When I'm learning in class, I use cloud-based virtual platforms.
- AUB2:** I access my personal materials through cloud-based virtual platform tools.
- PE1:** I find cloud-based virtual platforms provided by my institution useful to my study.
- PE2:** Using cloud-based virtual platforms provided by my institution increases my productivity.
- PE3:** Using cloud-based learning platforms provided by my institution increases my chances of getting a good grade.
- EE1:** My interaction with cloud-based learning platforms available in my institution is clear and understandable.
- EE2:** It is easy for me to become skillful at using the cloud-based virtual platforms' provided by my institution.
- EE3:** I find it easy to use cloud-based learning platforms provided by my institution.
- EE4:** Learning to operate cloud-based learning platforms provided by my institution is easy for me.