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# Analyzing the Students' Intention to Use Online Learning System in the Context of COVID-19 Pandemic: A Theory of Planned Behavior Approach

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## Abstract

COVID-19 caused universities to close their doors and compelled the switch toward online education system, Although this option was the best and the only way that guarantees the continuity of studies, yet students were not satisfied, in front of this situation exploring the key factors that affect students' intention to accept online education is of vital importance, and that is what the study seeks to pursuit. To empirically test the intentions to use online learning, the theory of planned behavior (TPB) was applied to Algerian university students. Data were collected using a structured questionnaire from 213 college students of six universities in northern Algeria. Results showed that attitudes, subjective norms, and perceived behavioral control (PBC) have positive and significant effects on students' intentions to use online learning systems. The obtained results validate the TPB framework which emphasizes the importance of TPB constructs to predict and explain intentions in the context of COVID-19 pandemic and online learning, which can have major implications for future researchers, policymakers, and practitioners in developing an effective online learning system for educational institutions in the context of health crises.

**Keywords:** COVID-19, education, online learning, technology, theory of planned behavior

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## Introduction

Online education mode usage has started with the emergence of the Internet since the 90s (Chandra, 2021). In the era of online learning, e-learning is experiencing rapid growth (Chang and Tung, 2008), and due to the increasing popularity of online learning, learning technologies have become the vanguard of learning management systems (Ngafeeson and Gautam, 2021). Recently, e-learning gained significant attention in higher education for it confers better access to learning resources online, using technology to upgrade learning (Regmi and Jones, 2020). Online learning is only one piece of distance learning. Online learning, e-learning, virtual learning, internet-based learning are terms that are interchangeably employed for this mode of learning. Online learning has been defined as "the use of the Internet to access learning materials; to interact with the content, instructor, and other learners; and to obtain support during

the learning process, in order to acquire knowledge, to construct personal meaning, and to grow from the learning experience" (Ally, 2011, p.17).

The COVID-19 pandemic is still causing humongous damage to all sectors, however, the degree of damage varies between countries and different sectors (Bouarar et al., 2020a; Mouloudj et al., 2020), including the education sector. Where the COVID-19 pandemic altered the regular face-to-face classroom education to online education (Khan et al., 2020; Wang et al., 2021), to maintain teaching activities (Lin et al., 2021), and the government around the world has shut all the educational institutions to curb the propagation of disease (Chandra, 2021). Ministries of education in almost all countries in the world have recommended or made it mandatory to implement online learning at all school levels in various countries (Ferreri, 2020; Wang et al., 2021). This decision has also been supported by UNESCO (UNESCO 2020a), which has declared that online learning can help stop the spread of the virus by avoiding direct interactions between people. UNESCO (UNESCO 2020b) has additionally provided a list of free educational platforms and resources that can be used for online learning according to the needs of each educational institution, providing social care and interaction during school closures. Therefore, during this health crisis, issues related to online learning has received increasing interest at the local, national, and global level, and it has also received great interest from policymakers, educational institutions (such as colleges and universities), international organizations along with researchers from different disciplinary specialties. In this context, Mahat (2021) found that most of the students had a propensity to use the online-class platform to improve their learning and communication pattern in the context of COVID-19.

Generally, intention is considered a major predictor of human behavior. In the e-learning context, Samsudeen and Mohamed (2019, p. 225) defined behavioral intention as the "intention of individuals to use e-learning systems from existing method of learning to the future". Previous research has shown that user's behavioral intentions can effectively predict technology acceptance and adoption behaviors (Chu and Chen, 2016). Mahat (2021) observed that the majority of students desired a homely environment studying, and also desired to opt for the online class as it is an independent method through which time; money, and effort are saved during the COVID-19 crisis. Hossain et al. (2020) developed a model that examined users' e-learning continuance intention among professional learners in Bangladesh. They found that learners' continuous intention to use m-learning applications could be affected by learners' satisfaction with mobile learning applications usage, cognitive need, and attitude. Maheshwari (2021) found that extrinsic factors such as ICT infrastructure and access to the internet have positively significant indirect influences on behavioral intentions to learn online. Knowing exploring students' intentions and determining factors that affect their beliefs regarding e-learning can helpful for academic administrators and managers to devise tools for encouraging more students to use this learning environment (Grandon et al., 2005), especially in the context of the health crises. Therefore, the COVID-19 pandemic might present an opportunity for educational institutions to boost their online learning and training potential (Maheshwari, 2021).

In Algeria, the LMD system (Licence/Master/Doctorat) is an educational system recently applied in the universities, as higher education system comprehensive reform to converge with the new socio-economic data circumstances; in this system, all the constituent notably teachers and students have become involved (Aoudjit Bessai, 2018). With the emergence of COVID-19, the Algerian government like many countries in the world took several measures to curb the

propagation of the virus, closing universities and schools for 21 to 30 weeks were among these measures (UNESCO, 2021a). The Algerian higher education ministry created distance education platforms, and therein teachers were asked to deposit electronic lessons and recorded videos, they were also asked to provide online lessons to avoid white scholar year. However, many of the dedicated efforts failed, since the success of online education system requires the concerted efforts of all the key factors namely: teachers, students, and educational institution administration, and the commitment of all parties to work in the light of clear and well-determined objectives and policies.

Although some studies have addressed the factors influencing students' intention to use online learning in the context of COVID-19 (such as Akour et al. 2021; Bui et al., 2021; Chandra, 2021; Jameel et al., 2021; Khan et al., 2020; Lin et al., 2021; Mahat, 2021; Mailizar et al., 2021; Maheshwari, 2021; Wang et al., 2021), there still a need to conduct further studies in this area of research for the following reasons: (1) the disparity of damage inflicted by the COVID-19 on higher education and the different period of closure of universities; (2) disparity in the level of technology adoption between countries; and (3) the different socio-economic and cultural factors between countries. In a bid to contribute to this area of research, we aim through our study to explore this particular topic in a different context from the previous studies. Firstly, the number of Algerian students is relatively high (roughly 1.6 million students) scattered on more than 110 universities. Second, online learning in Algeria is relatively new, besides; Algeria does not feature enough technological capabilities and infrastructure –likewise all developing countries– that allow a seamless adoption of the online learning system. Thirdly, Algeria did not experience a widespread of COVID-19 comparing to other European and South American countries. Therefore, the study confer several benefits for different parties such as students, teachers, students unions, universities, higher education ministry, and health authorities, to bridge this gap we explored students intention through the lens of the theory of planned behavior (TPB).

Based on the above, in this study, we will focus on students' (as customers) intention to use online learning, as students represent the hub of the educational process and without their effective involvements and participation all the best possible effort aimed at enhancing online learning quality would be fruitless. The rest of this paper is structured as follows. Section 2 describes the theoretical framework and hypothesis development for the study. Section 3 describes the research methodology was used. Section 4 presents the findings and discussion and in the last section, conclusions are presented.

## **Literature Review and Hypothesis Development**

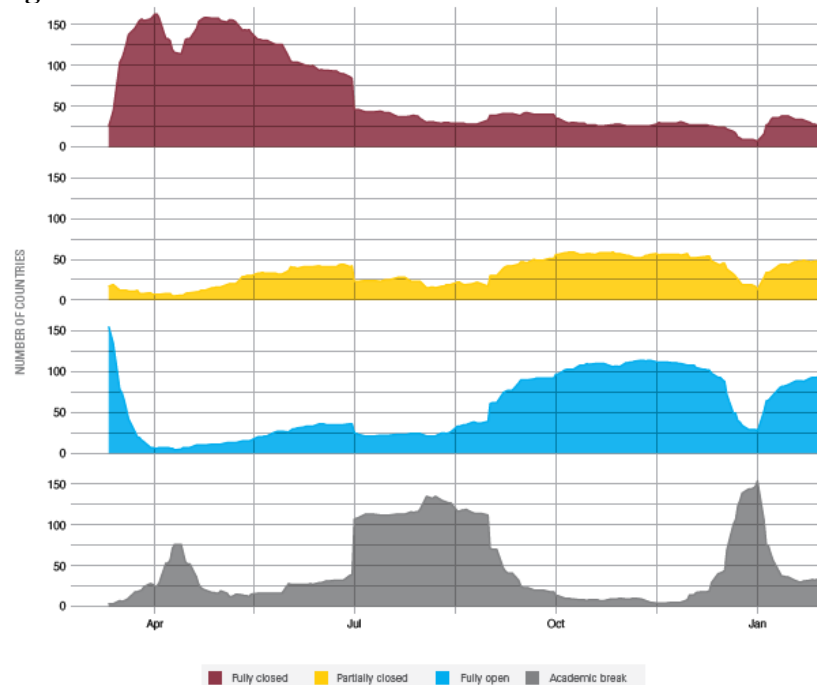
### ***COVID-19 Pandemic Impact on Education***

Online education in connection with the COVID-19 epidemic began unexpectedly and is unprecedented. In the second quarter of 2020, the COVID-19 crisis obliged numerous educational institutions to remain closed temporarily (Dhawan, 2020), and adopt online learning. As a result, about 1.2 billion were affected due to this pandemic and are currently taking distance learning using online platforms and applications (Chandra, 2021). According to World Bank estimates, the closure of educational institutions in the world could lead to losses of more than ten trillion US dollars in earnings overtime for this generation (World Bank, 2020). Online learning activities have started to be conducted at every level of education in kindergartens,

primary schools, secondary schools, and also at universities it is very difficult to predict when it will end because it is determined on the epidemiological situation which is constantly changing. There is also a research hypothesis that it will not be completed and the popularization of this type of online education system will be increased in all countries around the world (Li and Lalani, 2020). Therefore, the COVID-19 pandemic has presented an opportunity to experiment with online classes in universities (Kim et al., 2021).

Figure 1 shows that almost all schools around the world were closed, regardless of the level of educational advancement in the second quarter of 2020. The chart shows a certain decrease in the number of closed schools in May, which was coincided with the days off from school for students, i.e. academic break. This type of situation also occurred during the summer break in the months between July and September and also Christmas break between December and January. Nevertheless, it should be noted that even now, as the pandemic situation in the world is slowly beginning to stabilize, thanks to vaccination, not all academic institutions have returned to teaching at schools.

**Figure 1.** Time-Series of School Closure Status From March 2020 to February 2021



Source. UNESCO, (2021b). *Global monitoring of school closures caused by COVID-19*.

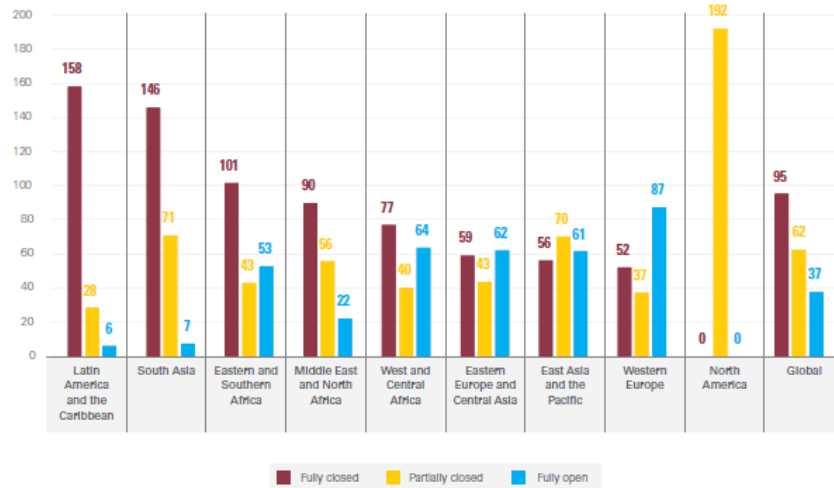
Note. The analysis covers schools from pre-primary to upper secondary level.

According to the latest statistics provided by UNESCO, the top ten countries with the longest full school closures during the period from March 2020 to February 2021, respectively (UNESCO, 2021): Panama (211 days), Salvador (205 days), Bangladesh (198 days), Bolivia (192 days), Brazil (191 days), Costa Rica (185 days), Kuwait (181 days), Mexico (181 days), Myanmar (177 days), and Iraq (173 days). Figure 2 shows that most students were unable to attend school due to closure in Latin America and the Caribbean, South Asia, and Eastern and South Africa. This was directly related to the critical situation related to the spread of the drastic COVID-19 pandemic scenario in these countries. On the other hand, in countries where the spread of the virus



COVID-19 and the number of deaths was lower, the process of opening schools began. It mainly took place in the countries of Eastern and Western Europe, Central Asia, and the Pacific.

**Figure 2.** Number of Students (in Million) Impacted in Countries With Fully Closed Schools as of February 2, 2021



Source. UNESCO, (2021b). *Op.cit.*

Report on the effectiveness of online education, which was carried out simultaneously in many countries, from different continents and from different cultures conducted in the USA, Canada, Great Britain, Australia, France, Germany, China, and Japan in October / November 2020, showed that the pandemic revealed the weaknesses of school systems around the world. Now is the time to redesign them to give better education to all students. Countries that invested in experienced teachers and supported their success even before the crisis may prove to be the most effective in minimizing learning loss (Dorn et al., 2020). According to the Centre for Experiential Legal Learning (CELL), the teachers very quickly made the "technical adaptation", they learned how to use communication platforms and mostly switched to conducting live lessons remotely, not only sending paper or electronic tasks for students (according to one study, 70% of teachers worked like this after just two months). The grassroots self-improvement of teachers during the COVID-19 pandemic was consisting of the exchange of experiences and information which was a very great success. Teachers educated other teachers outside the system, without waiting for training from the Ministry of Education in all countries of the world (Langford and Damşa, 2020).

Nevertheless, the pandemic has also left a negative mark on the education process. According to research, the social dimension of teaching was lost, cooperation between preferences was abandoned, the way of conducting lessons was dominated by teachers, which made the lessons tiring and draughty for the students that is why the student's motivation to learn decreased. Students who also found themselves in a difficult situation were deprived of relations with their peers overnight, and additionally buried an excessive number of tasks to be solved on one's own, it can therefore be concluded that COVID-19 caused more than just negative economic effects, but also socio-emotional consequences (Watkins, 2020).

### ***Theory of Planned Behavior (TPB)***

TPB proposed by Ajzen (1991), suggests that behavior is triggered by the intention to perform a certain behavior. It is a theory used to prognosticate and understand behaviors in various fields, including online learning behavior. TPB emerged as one of the most eminent and most highly cited models for exploring, predicting, and influencing human social behavior (Ajzen, 2012). Several studies utilized the TPB proposed to determine intention to use e-learning applications or systems. Chu and Chen (2016) used the extended TPB model with social identity and social bonds in predicting e-learning technology adoption. Lung-Guang (2019) introduced a self-regulated learning model into TPB to explore the intention to accept massive open online courses. Recently, Ngafeeson and Gautam (2021) used the TPB approach to investigate students' intentions to use the learning management systems (initial use and continuance use). Akour et al. (2021) and Kim et al. (2021) have integrated both technology acceptance model (TAM) and TPB to determine factors influencing students' intentions to use online learning.

Other researchers utilized other models. For example, Chang and Tung (2008) integrated the innovation diffusion theory (IDT) with TAM as a framework to investigate the factors that affected students' behavioral intentions to use the online learning course websites. They found that compatibility, perceived usefulness, perceived ease of use, perceived system quality, and computer self-efficacy have a significant impact on students' intentions to use the online learning course websites. Samsudeen and Mohamed (2019) used the theory of acceptance and use of technology 2 (UTAUT2) to investigate university students' intention to use and subsequent actual use behavior of e-learning systems in Sri Lanka. They found that constructs of UTAUT2 have a significant influence on intention and behavior to use of e-learning system. Van De Bogart and Wichadee (2015) adopt the TAM to explore factors that might affect undergraduate students' intention to use the online app for academic purposes, and they found that behavioral intention to use was significantly and positively related to perceived usefulness and attitude toward LINE app usage. Other studies have applied the TAM model to predict the intention to use online learning in the context of COVID-19 crisis (Khan et al., 2020; Mailizar et al., 2021). For instance, Khan et al (2020) found that intention was significantly and positively affected by ease of use and perceived usefulness in Bangladesh and Malaysia. Thus, it may be prudent to investigate students' intentions to engage in online learning during COVID-19 in Algeria. To investigate student's behavioral intentions, this study exhibits research that develops and applies measures based on the TPB model (Ajzen, 1991). Similarly, Wang et al. (2021) have applied the expectation confirmation theory to investigate the continuance intention in using online learning in the context of COVID-19 pandemic. They indicated that perceived usefulness and satisfaction have a significant effect on continuance intention.

### **Hypothesis Development**

#### ***Students' Attitudes Towards Use Online Learning System***

Attitude toward the behavior, which is one of the essential precedents in the TPB model, is defined as "the degree to which a person has a favorable or unfavorable evaluation or appraisal of the behavior in question" (Ajzen, 1991, p.188). In this study, we define attitude as "an overall positive or negative evaluation towards the behavior of use online learning system". Attitudes towards online learning systems are affected significantly by perceived usefulness (Kim et al.,

2021). Undoubtedly several factors may influence students to attitude towards online learning, such as students assimilation of the contents of the provided lessons, lessons quality, teachers' competence, and experience, lessons time convenience, and the rooted belief that lessons are important only for exams, contests, or work, people, in general, do not waste time on useless things. Van De Bogart and Wichadee (2015) found that attitude toward LINE app usage was positively related to undergraduate students' intention to use. Chu and Chen (2016) found that user attitude is positively and significantly correlated with e-learning intention. Several studies have found that attitude has a positive effect on the intention to use online learning systems (Akour et al., 2021; Kim et al., 2021; Mailizar et al., 2021; Ndubisi, 2006). Ilyas and Zaman (2020) showed that personal attitude was a significant predictor of intentions to persist in the online learning system. However, Lung-Guang (2019) found that attitude does not have a significant effect on the intention to accept open online courses. Thus, we developed the following hypothesis.

- H1: Students' attitudes have a positive and significant effect on their intentions to use online learning systems.

### ***Students' Subjective Norms***

According to the TPB, Subjective norm is an antecedent of behavioral intention (Ajzen 1991), is defined as "the level of social pressures exerted by a reference group that can influence a person's perception, feeling, preference, judgments, attitude, intention, and behavior" (Bouarar and Mouloudj, 2021, p.652). Subjective norms are associated with how close peers accept a particular behavior. Such as influences of parents, teachers, friends, mentors, and peers on students' desire and perceptions to use online learning. Subjective norms arise from normative beliefs, which exhibit the propensity to accept one's close peer's opinion (Ajzen, 1991). Bouarar et al. (2021b) confirmed the effect of subjective norm on intention to use online food delivery during the COVID-19 pandemic. Subjective norms have a positive effect on perceived ease of use and perceived usefulness (Khan et al., 2020), intention to use mobile learning (Akour et al., 2021), the intention of using e-learning (Chang et al., 2017; Chu and Chen, 2016; Yau and Ho, 2015), intention to accept open online courses (Lung-Guang, 2019), intentions to persist in the online education system (Ilyas and Zaman, 2020), and intention to use online learning systems (Kim et al., 2021). However, Ndubisi (2006) found that subjective norm does not have a significant effect on the intention to use online learning. Therefore, the following hypothesis is proposed:

- H2: Students' subjective norms have a positive and significant effect on their intentions to use online learning systems.

### ***Students' Perceived Behavioral Control (PBC)***

Ajzen (1991, p. 183) defined PBC as a "person's perception of the ease or difficulty of performing the behavior of interest." This means that behavioral intention increases with the increased perceived ease of performing a particular behavior, while perceived difficulty leads to inhibit the willingness or the readiness of performing a particular behavior due to the permanent or temporary inability feeling. The online learning system is easily accessible and can even reach rural and remote areas (Dhawan, 2020). Mahat (2021) found that many students believed that online classes are among the easiest platforms in terms of sharing and collecting the needed

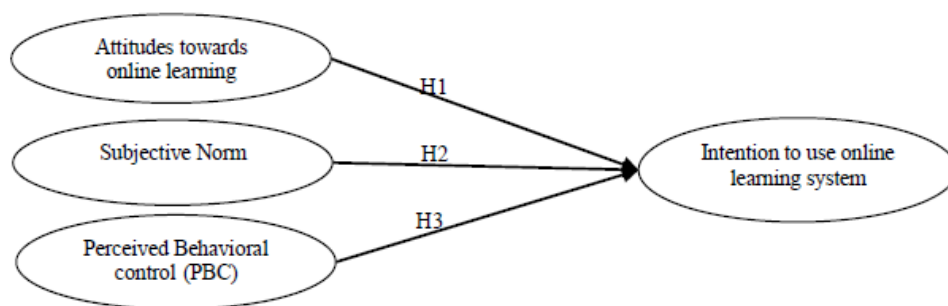
information. However, several learners are not acquainted with e-learning and in some contexts, lack rudimentary IT knowledge and skills (Regmi and Jones, 2020). There are different barriers of online learning, Regmi and Jones (2020) identified four barriers: (1) poor motivation and expectation; (2) resource-intensive (time, cost, and labor); (3) not suitable for all disciplines/contents; and (4) lack of IT skills. Students find some difficulties and eschew online courses if they lack technical knowledge and the elements necessary to succeed (Seery et al., 2021).

Saade and Bahli (2005) revealed that perceived usefulness and perceived ease of use have significant and positive effects on the intention to use the internet-based learning systems. Chang and Tung (2008) have demonstrated that computer self-efficacy and perceived ease of use have positive effects on students' intention in using online learning course websites. Mailizar et al. (2021) showed that perceived ease of use and perceived usefulness were significant predictors of intention to use e-learning. Jameel et al. (2021) revealed that facilitating conditions and effort expectancy and habit have a positive influence on intention to use e-learning. Ndubisi (2006) found that PBC has a positive effect on intention to use online learning. Chu and Chen (2016) showed that PBC has a significant and positive effect on e-learning intention. Lung-Guang (2019) also found that PBC has a significant effect on the intention to accept open online courses. However, Kim et al. (2021) found that PBC does not have a significant effect on the intention to use online learning systems in higher education. Hence, the following hypothesis is proposed:

- H3: Students' perceived behavioral control has a positive and significant effect on their intentions to use online learning systems.

The summary of the hypothetical relationships among the variables is shown in Fig. 3.

**Figure 3.** The Research Model.



## Methods

### *Data Collection Process*

The population for the current research is students at six universities (University of Algiers 1; 2; and 3, University of Bejaia, University of Blida, and Higher School of Commerce), in northern Algeria. The sample is selected using non-probability convenience sampling, including those who exhibited a willingness to participate in the study. Convenience sampling allows a researcher to choose respondents who are accessible and available at a particular time and place (Etikan et al., 2016). Data has been collected from the beginning of September to October 25,

2020. In total, 216 questionnaires were returned out of 300 distributed. However, the analyses were ultimately conducted on 213 questionnaires due to some missing values in the data after the data cleaning process. The participants' demographical distribution is shown in Table 1.

**Table 1.** Demographic Characteristic of Participants ( $n = 213$ )

Characteristic	Variables	n	(%)
Gender	Male	87	40.85
	Female	126	59.15
Age	18-22	76	35.68
	23-30	92	43.19
	Above 30	45	21.13
Education	Bachelor Students	79	37.09
	Master students	86	40.38
	Doctoral students	48	22.53
Household Income (Monthly)	Less than 40,000 AD	101	47.42
	40,000–70,000 AD	82	38.50
	Above 70,000 AD	30	14.08

Table 1 reveals that 59.15% of the participants were females, while 40.58% were males, the average age of respondents was 25.15 years old, among which 43.19% ranked between 23-30 years, with regards to education level, master students represented 40.38%, bachelor students represented 37.09%, while the rest were Ph.D. students. Finally, with regards to monthly family income, 47.42% of students' family income do not exceed 40.000 DA, while 38.50% of respondents family ranges between 40.000-70.000 DA, and about 14% their family income exceeds 70.000 DA

### Measures

A structured questionnaire was employed to collect data and measure the variables of this study. Subsequent to the preliminary completion of measurement variables development, two online learning system experts assessed the measurement variables and gave feedback on the clarity of the questionnaire. As shown in Table 2, the 12 items used to measure the four constructs were adopted from previous studies. All items were measured using a five-point Likert-type scale that ranged from (1) strongly disagree to (5) strongly agree. The questionnaire was initially developed in English and then translated into the Arabic language by back-translation technique to guarantee the quality of the translation. Both versions of the questionnaire were distributed according to the respondents' will.

**Table 2.** Measurement of Constructs

Constructs	Measurement Item	Reference
Attitude	ATT1 Using an online learning system is a good idea.	Davis (1989); Cheung and Vogel (2013)
	ATT2 I like using the online learning system.	
	ATT3 It is desirable to use an online learning system.	
Subjective Norm	SN1 People important to me support my use of the online learning system.	Ndubisi (2006); Ngafeeson and Gautam (2021).
	SN2 People who influence me think that I should use the online learning system.	
	SN3 People whose opinions I value prefer that I should use the online learning system.	
Perceived Behavioral Control	PBC1 Using an online learning system is entirely within my control.	Chu and Chen (2016); Ndubisi (2006); Yu and Yu (2010)
	PBC2 I have the resources to use the online learning system.	
	PBC3 I have the ability to use an online learning system.	
Intentions	INT1 I intend to use the online learning system in the future.	Ngafeeson and Gautam (2021); Saade' and Bahli (2005)
	INT2 I predict I would use the online learning system in the future.	
	INT3 I plan to use the online learning system in the future.	

## Results and Analysis

### *Descriptive Statistics, Reliability, and Correlation*

Regressions were used to analyze the data. The Special Package for Social Sciences (SPSS) version 26.0 was employed for the data analysis. The reliability analysis was conducted on the four constructs using Cronbach's Alpha ranged from 0.81 to 0.93; it is noteworthy that no items have been excluded as the values have met the requirement of over 0.60 recommended by Malhotra (2010).

**Table 3.** Reliability Analysis, Skewness, and Kurtosis

Constructs	Cronbach's alphas	Skewness	Kurtosis
ATT	,895	-1,354	2,245
SN	,927	-1,246	1,877
PBC	,937	-,792	,725
INT	,819	-1,277	2,076

Test of normality is a key test of regression analysis (Auza and Mouloudj, 2021). As suggested by Byrne (2016), a normal distribution has skewness and was over than kurtosis of zero, with a measure of skewness statistics scoped between  $\pm$  two (-2 and +2) and kurtosis between  $\pm$  seven (-7 and +7). Values that rise above or decreases under these ranges are suspect. Our results reveal that the values of skewness ranged between -1,354 and -0,792, whereas the values of kurtosis ranged between +0.725 and 2.245, accordingly guarantee that the data have a normally distributed. Moreover, multicollinearity can influence any regression model with several predictors (Auza and Mouloudj, 2021). To assess multicollinearity, we use two indicators are variance inflation factor (VIF) and tolerance. As suggested by Hair et al. (2013) value of VIF above 5.0 and the value of Tolerance less than 0.20 indicates that there is a problem with multicollinearity. The results shown in Table 5 confirm that there is no problem with multicollinearity.

**Table 4.** Descriptive Statistics and Correlation Matrix

Constructs	Mean	SD	ATT	SN	PBC	INT
ATT	3,835	,820	1			
SN	3,669	,756	,642**	1		
PBC	3,294	,762	,618**	,517**	1	
INT	3,981	,730	,747**	,685**	,723**	1

Table 4 shows the correlation between the constructs adopted in the study. All the bivariate correlations are significant with the highest correlation ( $r = 0.747$ ,  $n = 213$ ,  $p < 0.01$ ) between attitude and intention to use the online learning. It means an increase in the positive attitudes relate to the increase of intentions. Subjective norm also has a strong correlation with use intentions as evident from table 4 ( $r = 0.685$ ,  $n = 213$ ,  $p < 0.01$ ). In addition, PBC has a strong correlation with use intentions ( $r = 0.723$ ,  $n = 213$ ,  $p < 0.01$ ). Other correlations are between 0.517 to 0.642 and were significant.

### *Testing of Hypothesis and Results*

The use of regression analysis germane with Ilyas and Zaman (2020) who used TPB by exploring online students' persistence intentions. The findings of the analysis are included the Table 5.

**Table 5.** Regression Analysis Results for Intention to Use the Online Learning

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(constant)	,672	,150		4,470	,000		
ATT	,305	,048	,342	6,347	,000	,476	2,101
SN	,266	,048	,275	5,551	,000	,564	1,772
PBC	,353	,046	,369	7,635	,000	,593	1,685
<i>R</i> = ,843; <i>R Square</i> = ,711; <i>Adjusted R Square</i> = ,706; <i>F</i> = 171,029; <i>Sig.</i> = ,000							

Independent variables: Attitude towards online learning (ATT), Subjective norm (SN), Perceived behavioral control (PBC).

Empirical evidence that PBC with ( $B = 0.353$ ,  $t=7.635$ ,  $p \leq 0.01$ ) is the most contributor to the dependent variable (use intentions). It means one unit rise in PBC results in a 0.353 unit change in the user intentions. Thus hypothesis 3 is supported. With ( $B = 0.305$ ,  $t=6.347$ ,  $p \leq 0.01$ ), attitudes towards online learning is the second most contributor to the dependent variable. A one-unit rise in attitude prompts a 0.305 unit change in the user intentions. Thus hypothesis 1 is supported. The subjective norm with ( $B = 0.262$ ,  $t=5.551$ ,  $p \leq 0.01$ ) reflect one unit change in subjective norm accounts for 0.262 unit change in the dependent variable. Thus hypothesis 2 is supported. In total, empirical evidence showing that constructs TPB accounted for 71.7 percent of the variation in intention to use the online learning system in the context of the COVID-19 pandemic.

## Discussion

The research's purpose is to use a TPB model to study students' intentions to use online learning. The first issue which should be discussed is about attitudes towards online learning is found to influence intentions to use online learning system. In other words, a positive attitude is significantly predicting intention to use online learning. Thus, hypothesis 1 is supported. We expect that students' positive attitudes will encourage their highest levels of effort and commitment. We may conclude that when students have positive and favorable attitudes towards online learning, they are more likely to develop intentions to use online learning. This result is in line with Mailizar et al. (2021) who demonstrated that students' attitudes toward online learning use are the strongest predictor of intention to adopt online learning during the coronavirus outbreak in Indonesia. Also, this result is consistent with Akour et al. (2021); Buabeng-Andoh (2018); Chu and Chen (2016); and Van De Bogart and Wichadee (2015) studies results.

This study also shows that subjective norms are found to have a significant effect on intentions to use online learning. This finding is germane with H2. That is to say, the subjective norm is significantly predicting intention to use online learning. In another word, the students with an influential group (such as teachers and peer groups) are more likely to make intentions to use online learning. Because the reference group can exert influence on students' preferences, beliefs, attitudes, and decisions. In addition, both informative and normative influence students' intentions. According to the TPB, individuals appreciate the feedback opinions of the important people of their surroundings and it influences their likelihood of doing a certain behavior (Ajzen, 1991). This result is consistent with the results of empirical past studies have found that subjective norm significantly affects the students' intention to use online learning (Akour et al., 2021; Chang et al., 2017; Chu and Chen, 2016; Kim et al., 2021; Lung-Guang, 2019). However, as stated by Davis et al. (1989, p. 986), "it is difficult to disentangle direct effects of subjective norm on the behavioral intention from indirect effects via attitude". Studies conducted by

Buabeng-Andoh (2018) and Park (2009) have found that subjective norms significantly influenced attitudes toward the use and behavioral intention to use e-learning.

Importantly, there was evidence that the PBC affects the intention to use online learning. This result is in agreement with H3. Our results show that students' PBC is the best predictor of the intention to use compared to attitudes and subjective norms. This means that students who have enough confidence in their capabilities to implement online learning behavior (such as web accessing, browsing, searching, storing) are more likely to use the online educational system. This result is consistent with the results of the empirical studies of Akour et al. (2021); Chang and Tung (2008); Chu and Chen (2016); and Ndubisi (2006) which have also shown that PBC had a positive and significant impact on intention to use online learning. Similarly, this result is in line with Ilyas and Zaman (2020) who found that PBC has a significant effect on intentions to persist in an online course. However, Kim et al. (2021) found that PBC does not have a significant effect on intention to use online learning in higher education. This might be ascribed to the different levels of difficulty and obstacles students may face from one country to another as a result of economical and technological differences. Hence, we assume that the PBC effect on behavioral intention may differ with the type of behavior under study and the context in which the study was conducted.

## **Conclusions**

The pandemic has surprised and forced us to change our daily lives, but it has also revealed knowledge about the various phenomena we were not fully aware of. Life organizer for many students before the pandemic COVID-19 was school, which creates too little field for independent study, for independent choices and searches. However, thanks to the internet access to knowledge is unlimited in modern times, and acquiring knowledge was made possible without even leaving home. Accordingly, understanding students' usage intentions for online learning systems in the context of the COVID-19 pandemic is significant for online learning. The results of this research found that the favorable attitudes toward use, subjective norms, and PBC influence intentions to use online learning systems. The results also showed that the TPB model explained 71.7 percent of the variance in behavioral intention among students in Algeria. The use of the TPB model in examining behavior intention to use online learning in the context of the COVID-19 pandemic was also validated by the findings.

## ***Practical implications***

Practically, online learning confers many benefits such as reducing costs and assuring time and place utility. On the other hand, this system is marred with some demerits as well since removing all sorts of hurdles is quite impossible, some students, for instance, are insouciant to learning online, besides, some teachers lack knowledge in the field of technology, along with the insufficient support for teachers and students, all these factors combined lead to students' reluctance to use online learning, which results in negatively affecting online learning quality. Nonetheless, using online learning during health crises such COVID-19 pandemic is the ideal if not the only solution to curb the propagation of the virus, especially in countries witnessing a widespread of the disease.



The results showed that students' attitudes towards the online education system affect their use of this system, therefore the various stakeholders (such as teachers, administration) must stimulate a more positive attitude among students by explaining the advantages of online education during a health crisis, demonstrating its benefit through Videos, along with preparing and distributing a comprehensive and simplified guide to the concerned parties. It is also necessary for designers of online education programs to study learners' attitudes, and then try to change negative beliefs about online education. Some students may have a false belief that online education requires high technological skills, high concentration, or inutile. In this respect, the administration must play a key role in providing reliable information that helps correct these beliefs.

The study also found that subjective norms exert a significant influence on the intention to use the online education system, and therefore groups' pressure such as parents and professors should encourage their children/students to use online education, as well, positive electronic word of mouth should be encouraged on social media to convince more students of advantages of during health crises. University administration can also transmit advertising messages to leaders of opinion (such as students unions representatives, excellent students) to inspire them on how to encourage students to engage in the online education system. Other leaders of opinion (such as distinguished professors and doctors) can also contribute to raising awareness of the need to protect oneself, and taking the necessary and precautionary measure to avoid contracting the virus and not being the reason to infect others, and dedicating all the best efforts to convince students of the advantages of learning from home as an optimal option in the context of health crises.

Additionally, the results revealed that perceived behavioral control affects intention to use online learning. Hence, higher education institutions must diligently strive to remove the barriers that stymie students' acceptance of online education. Although some of these challenges are not under the control of institutions, some other factors higher education institutions can influence (Seery et al., 2021). Such as improving the quality of online lessons in terms of voice and image, training teachers to work in an online learning environment, providing the necessary material and moral support for students suffering from physical obstacles (such as the inability to use technology); lack of basic needs (such as food and medicine); and or psychological obstacles (such as hesitation, doubt, lack of confidence). Among the factors that lie out of university, institution control is internet connection fluctuations or students inability to acquire the necessary accessories to study online (such as smartphones, laptop), in this vein, the concerned authorities must intervene within their capabilities to find solutions to such problems.

Finally, changes in the educational system are extremely difficult, as they violate the traditional order and habits of generations, and therefore strategy for it must be prepared carefully and on every stage separately. we believe that online learning success requires the nexus of all parties' efforts including (1) Students since they are the first beneficiary of online learning and the cornerstone of the for online learning success or failure; (2) Teachers, through improving their capabilities and performance; (3) Universities institutions, through providing a suitable online learning environment including supporting and motivating students and teachers and to carefully listen to their complains and suggestions to improve the provided services; and (4) Public authorities- especially higher education ministry- through designing a clear strategy and removing any hurdles that prevent the effective implementation of online learning by providing the necessary technological, human, and financial resources.

### ***Limitations and Future Research***

Although our study has upgraded our understanding of how to influence intentions formation to use online learning system, it has some limitations. Firstly, the Algerian different context as a developing country in comparison to other developing countries is useful to conduct further studies to explore the continuity to using online learning in post-covid19 context to provide clear-cut vision for education policy-makers especially if linked with sustainable education and learning; secondly, we used a relatively small convenience sample, hence using random sampling method with large number of respondents would confer much more benefits and allows generalizing results; thirdly, the sample of the study covered university students of various specialties, many of whom may enjoy major capabilities to use online learning, thus we recommend to conduct other studies that focus on (1) specific disciplines (such as medicine, accounting), (2) specific university level (such as bachelor, master, PhD), (3) other educational levels (such as secondary, middle school), Undoubtedly, this will provide more useful insights into the differences that features the various segments, which may allow designing more effective online learning programs for each segment. Fourthly, the study addressed students' intention only, which might be insufficient to achieve online education quality, and then it is preferable to study the teachers' incentive for the optional use of online education and to identify the major obstacles that may hinder the fulfillment of their duties in this regard. Fifthly, despite the importance of using the TPB in such studies, the combination of TPB with other theories, such as social learning theory, innovation diffusion theory, and technology acceptance model, may increase the interpretive power to predict students' intentions in the education context.

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