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The Use of Online Flipped Classrooms during Covid-19 by Gifted Students: A Path Analysis Using UTAUT Model

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This study used the UTAUT model as the theoretical basis to assess and evaluate the use of online flipped classrooms during covid-19 by gifted students. The Online Flipped Classrooms model is supposed to be an active educational approach due to the interest shown by researchers and teachers in it. It allows learning to take place everywhere. Convenience sampling was employed to collect the required data. This involved gifted primary and middle and secondary school students at Makka schools for gifted students distributing the research instrument to their students. The model of this study is designed based on the UTAUT model. This study investigates the effects of four variables: Performance expectancy, Effort expectancy, social influence, and Facilitating conditions on students' intentions to use Online Flipped Classrooms. BI correlates positively with performance expectancy (PE), effort expectancy (EE), social influence (SI) and facilitating conditions (FC). PE, EE, SI and FC together yielded a coefficient of multiple regression (R) of 0. 763 and a multiple correlation square of 0. 760. This shows that 76.0% of the total variance in behavioural intention to use (BI) of those who participated in the study is accounted for by the combination of PE, EE and SI. BI was positively impacted by PE, EE, SI and FC. Further studies with are recommended to examine the effect of OFC using UTAUT Model.

Keywords: performance expectancy, effort expectancy, social influence, facilitating conditions, flipped classroom, covid-19

INTRODUCTION

In light of what the world is experiencing today from the invasion of the Corona epidemic and the measures taken by different countries to protect their citizens, including school and university students, comes on top of these measures the imposition of a complete and partial ban (Jaoua, Almurad, Elshaer and Mohamed, 2022; Sigit, Ristanto& Mufida, 2022).

It has become necessary for educational institutions to replace education within their walls with distance education, and this rapid transformation (Demir& İlhan, 2022; Prasetyanto, Rizki, and Sunitiyoso,2022; Rini, Mujiyati., Sukamto& Hariri, 2022)

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Surprisingly, the responsibility has been placed on the freeing of those in charge of teaching different subjects in general, and it has become necessary for everyone to employ distance learning platforms and the various software necessary to teach their courses (Jaoua et al., 2022; Prasetyanto et al.,2022).

The experience of digital and distance education in the Kingdom was more difficult for young students, as in other countries. It is unlikely that elementary school students will have their own digital devices for learning. Primary school students are more likely to feel that they will learn better if they return to physical education (58% of primary school students compared to 50% of middle school and high school students). While a few primary school principals reported the blended learning approach as effective: 33% of primary school principals saw it, compared to an average of 53% of middle and high school principals (Education for Global Development,2021).

The affected countries should resort to distance education to reduce the disruption that students and the educational process as a whole will be exposed to, and indicated on its website that distance education and resorting to the method of online education will help stop the spread of the Corona virus and ensure the continuation of basic services in the field of education .The organization also advised all those who are interested in the educational process to stay in contact with students and provide psychological support to them and avoid them falling into isolation, as well as ensuring the continuation of research according to the curricula and facilitating education by providing additional materials for reading and education for students (Almaiah, Al-Khasawneh and Althunibat,2020; Baber,2021; Clark, Nong, Zhu and Zhu,2021).

SNSs such as Facebook, Twitter and YouTube have connected students around the world in ways that humans did not expect. Global has already been achieved. So, there is no doubt, that social media is the future and has become the primary means, especially for the younger generations, to interact with the world (Cheng-Min,2019).

The Corona pandemic has forced the world to shift to digital learning. Online flipped classrooms (OFC) is among instructional approaches (Khodaei, Hasanvand, Gholami, et al., 2022; Xu, Chen, Feng and Luo, 2022), that can be described as a promising alternative to teach a wide range of students especially gifted ones, during and post the COVID-19 epidemic (Khodaei et al., 2022). Learners and their teachers meet online. This strategy has attracted great interest among researchers because of its flexibility on the one hand, and the pandemic and what it has imposed on educational systems on the other hand (Chu et al.,2019; Köksal and Han,2022).

Flipped learning is one of the modern technical solutions to address the traditional weakness and develop students' thinking skills. In flipped learning, technology is employed to take advantage of learning in the educational process, so that the teacher can spend more time in interaction (Hariadi et al.,2022), dialogue and discussion with students instead of giving lectures, where students watch a short video of lectures at home, so that the most time is used to discuss the content in the class under teacher supervision.

Flipped learning is one of the types of blended learning that uses technology to transfer lectures outside the classroom, and thus is considered part of a broad movement in which blended learning, inquiry learning and other teaching strategies and various methods that seek flexibility and activate the role of the student and make learning fun and interesting, intersect (Setiawan, Muhtadi, & Hukom,2022).

Flipped learning is also an educational model in which the lecture and homework are reflected in all its forms. It is a form of blended education that includes the use of technology to benefit from self-learning and the use of time in the classroom to perform activities and duties (Atwa et al.,2022).

This style of learning relies on the presentation of a short video that students watch in their homes or anywhere else before attending the lesson, while the lecture time is devoted to discussions, projects and exercises, and the video clip is an essential element in this style, whether it is recorded by the teacher and uploaded to the Internet or uploaded to the Internet (Ayçiçek& Yanpar,2018).

There is no one way to implement Flipped Learning, but the student must see the material before coming to class. In the case of a lesson in which the video is used to present and explain the material to the students, the student must watch the video related to the class session the day before the lesson. Students are encouraged to focus while watching the video, especially with regard to distractions that can dilute their focus while following the lesson, such as the phones or tablets that 21st century students often get hung up on (Demirdag,2016). While following the explanation of the lesson, the student takes notes and questions, and the student can benefit from the possibility of stopping the video to take notes and questions before continuing the explanation (Mallik& Mallik, 2017; Su Pin et al.,2020). The student can also repeat a certain part of the explanation, and this is similar to giving the student the possibility of stopping, presenting and rewinding the teacher during the explanation.

At the beginning of the lesson/lecture, time should be given to the students' questions about the material they have seen. This time (questions and answers) is necessary to answer the students' questions, and it also allows making sure that the students are familiar with the material. The student who has seen the material can ask and discuss (Su Pin et al.,2020).

After the students' questions and observations are discussed at the beginning of the lesson, the teacher has prepared the activity for the day, which may include laboratory experiments, investigative research tasks given to students, or an applied activity to solve a problem related to the lesson or even a formative test, and during the direct class session (Ayçiçek& Yanpar,2018).

Unified Theory of Acceptance and Use of Technology (UTAUT)

UTAUT was developed by Venkatesh et al. (2003). This model has four core constructs which predict users' behaviour intention and their actual use (performance expectancy PE, effort expectancy EE, social influence SI, and facilitating conditions FC).

Performance expectancy PE

PE can be defined as the degree to which the student expects that using the system will help him /her to attain gains in academic works (Cheng-Min, 2019; Raffaghelli, Rodríguez and Guerrero-Rold´an,2022). The higher the student's PE, the stronger the BI and UI (Venkatesh et al., 2003).

Effort expectancy EE

Venkatesh et al. (2003, p.450) defined EE as " the degree of ease associated with the use of the system". Most researchers found that effort expectancy positively influences the behavioural intent of use (Alshammari,2021; Cheng-Min, 2019; Raffaghelli et al.,2022; Tan,2013). When the system is easy to use, it is likely to improve performance (Davis ,1989).

Social influence SI

SI is about influential and important people's views in the students' surroundings regarding the use and importance of technology use. social environment has a major impact on people's behaviours. Previous studies found SI to have a significant effect on BI(Aliaño et al.,2019;Sultan,2021).

Facilitating conditions FC

FC can be explained by the perception of using organizational and technological infrastructure to promote the use of new systems (Jameel, Karem,and Ahmad, 2022). users' perception of their ability to access the resources required and support necessary for e-learning services (Jameel et al.,2022). Gunasinghe et al. (2019) reported a significant increase of BI to use e-learning due to FC.

Behaviour intention BI

BI refers to the willingness to use a specific technology or system (Sultan,2021). Bi is positively influenced by PE, EE, SI, and FC (Aliaño et al.,2019; Cheng-Min, 2019; Raffaghelli et al.,2022, Sultan,2021)

Applied research regarding the UTAUT model has been extensive. This model is likely to be a suitable one to be used online learning (Raffaghelli et al.,2022). UTAUT model, as indicated by Venkatesh et al. (2003) contributes substantially to the exploration of technology acceptance and usage (see figure 1.).

Therefore, this study used the UTAUT model as the theoretical basis to assess and evaluate the use of online flipped classrooms during covid-19 by gifted students.

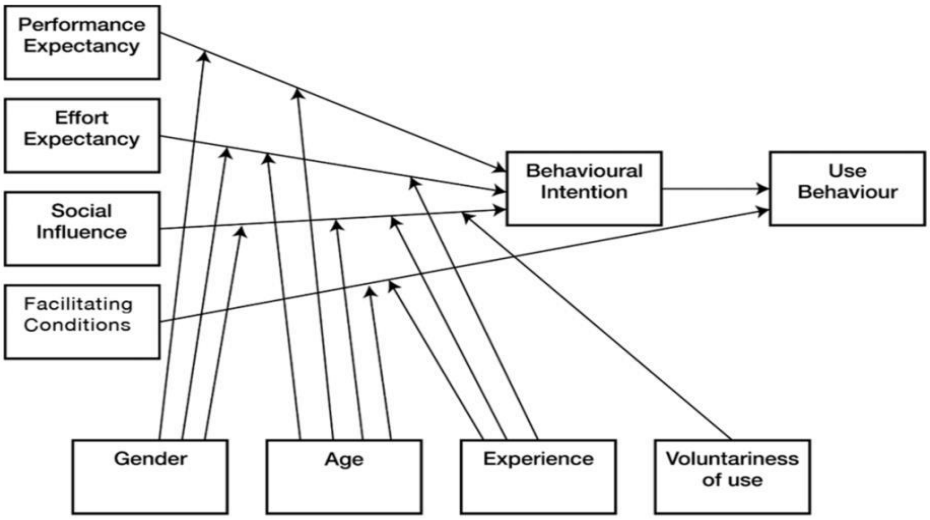

Figure. 1
UTAUT Model (Venkatesh et al., 2003, p. 447).

Problem Statement

Due to the danger of social rapprochement in light of the Corona pandemic, schools were closed in all countries, including the KSA, due to the rapid spread of the Corona virus and the need to stay and maintain the continuity of the educational process ,the Ministry of education has implemented and activates the distance education system, which will provide educational content for students, in addition to broadcasting educational materials on television and through electronic educational platforms, as students learn remotely at any time they want.

Therefore, using the distance education pattern is one of the successful means in dealing with problems caused by the Corona pandemic (Taner, Akyıldız, Gülay& Özdemir, 2021, Tatlı, Selçuk& Gülay,2022; Ulaş et al.,2021; Yakar, 2021; Yazıcı et al.,2021). E-learning is the process of separating the learner and the teacher in the education environment and transferring the traditional environment of education from a university or school and others to a multiple and geographically separate environment (Kayaalp, Meral & Başcı,2021; Kolan& Dinçer,2021; Kurtdede & Yıldırım, 2022), and it is a modern phenomenon of education with the accelerating technological development in the world.

Hypotheses

Hypothesis 1: PE positively affects students' intentions to use OFC.

Hypothesis 2: EE positively affects students' intentions to use OFC.

Hypothesis 3: SI positively affects us students' intentions to use OFC.

Hypothesis 4: FC positively affects us students' intentions to use OFC.

METHOD

Convenience sampling was employed to collect the required data (sample being drawn from that part of the population that is close to hand). This involved gifted primary and middle and secondary school students at Makka schools for gifted students distributing the research instrument to their students. In total, 250 questionnaires were distributed and 180 responses were received. 10 questionnaires were excluded due to missing data. The final sample consisted of 170 students. For generalizability purposes (Hair et al.,2006), the sample size should be 15–20 observations per variable. Therefore, the sample size is seen as adequate. Criteria for inclusion were as follow:1) to be primary, middle and secondary school student, 2) Lists of talented students were obtained from psychologists and social workers, 3) Raw intelligence score of 32 on Raven colored progressive test (Eissa & Sayed,2012), and 4) high score on The School Attitude Assessment Survey (McCoach & Siegle,2003)

Students were grouped into three categories (i.e., group one: primary school students, grades 4-6, middle schools' students, grades 1-3, and secondary school students, grades 1-3). All the necessary materials for students were available via paper and pencil method. As shown in Table 1, 58.8% of participants were females (n=100 students) and 41.2% were males (n=70 students). In terms of age, 23.5%, were 10-12 years, 41.1% 13–15 years, and 35.2% were 16-18 years.

Table 1
Demographic characteristics of the sample

Variable	Number of students	Percent (%)
Gender		
Male	70	41.2%
Female	100	58.8%
Age		
10-12	40	23.5%
13–15	70	41.1%
16-18	60	35.2%
Grade level		
4-6 primary	40	23.5%
1-3 Middle	70	41.1%
1-3 secondary	60	35.2%

Model design

The model of this study is designed based on the UTAUT model (see fig.2). This study investigates the effects of four variables: PE, EE, SI, and FC on students' intentions to use OFC. The author did not consider the moderating effect of gender, age, experience, and voluntariness in her study.

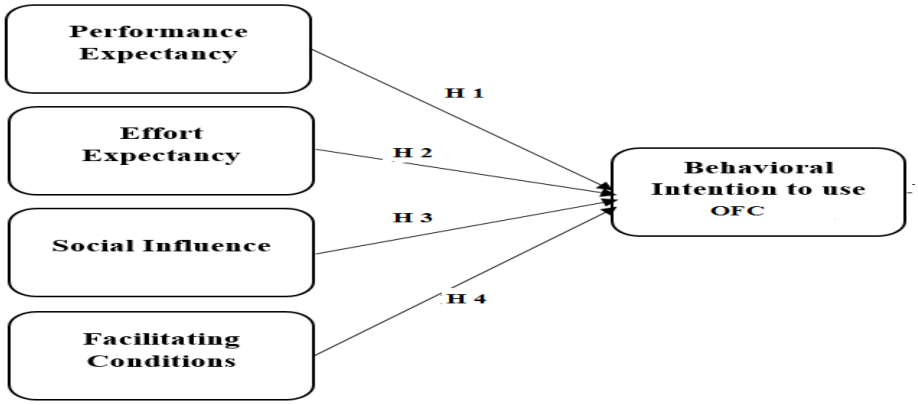

Figure 2
Proposed model

Instrument

A self-report 15- item survey instrument was developed particularly for this research study, based on UTAUT model (Venkateshet al.,2003). It was measured on a seven-point Likert-type scale (1 = strongly disagree 7 = strongly agree). Each variable has three items (see table 2 for description).

Table 2
Scale items

Variable	items	Source(modified)
PE	PE1. It is useful to use OFC in my learning	Alshammari, S. H. (2021); Cheng-Min, C. (2019) Jameel, A.S., Karem, M.A., Ahmad, A.R. (2022), Venkatesh, V., Morris, M. G., Davis, G. B., and Davis, F. D. (2003)
	PE 2. I can fulfill all needed activities even in OFC	
	PE 3. I can get high marks even in OFC	
EE	EE1. I can easily learn in OFC	Alshammari, S. H. (2021); Cheng-Min, C. (2019) Jameel, A.S., Karem, M.A., Ahmad, A.R. (2022), Venkatesh, V., Morris, M. G., Davis, G. B., and Davis, F. D. (2003)
	EE2. I can show my abilities in OFC environment	
	EE3. Learning in OFC environment is easy and interesting	
SI	SI1. OFC environment is supported by my school	Alshammari, S. H. (2021); Cheng-Min, C. (2019) Jameel, A.S., Karem, M.A., Ahmad, A.R. (2022), Venkatesh, V., Morris, M. G., Davis, G. B., and Davis, F. D. (2003)
	SI2. My teachers advise me to be creative using OFC	
	SI3. My teachers help me a lot in OFC environment	
FC	FC1. I have the ability to be learnt in OFC environment	Alshammari, S. H. (2021); Cheng-Min, C. (2019) Jameel, A.S., Karem, M.A., Ahmad, A.R. (2022), Venkatesh, V., Morris, M. G., Davis, G. B., and Davis, F. D. (2003)
	FC2. I have all the necessary capabilities to be learnt in OFC environment	
	FC3. I find no difference between OFC environment and traditional classroom	
BI	BI .1 recommend using OFC	Alshammari, S. H. (2021); Cheng-Min, C. (2019) Jameel, A.S., Karem, M.A., Ahmad, A.R. (2022), Venkatesh, V., Morris, M. G., Davis, G. B., and Davis, F. D. (2003)
	BI. 2 I plan to OFC for ever	
	BI. 3 I prefer using OFC	

Reliability coefficient of internal consistency

The Cronbach's alpha reliability coefficients were determined as α = .93 for PE, .90 for EE, .92 for SI, .91 for FC, .93 for BI and .94 for the whole scale.

Table 3
The scale subscales item-subscale total score correlations

subscales and items	Item-subscale total score correlation coefficients		Item-total score correlation coefficients		Cronbach′s α
	r	P	r	P	
PE					
Item 1	.80	< .001	.76	< .001	.93
Item 2	.61	< .001	.56	< .001	
Item 3	.60	< .001	.55	< .001	
EE					
Item 4	.80	< .001	.76	< .001	.90
Item 5	.54	< .001	.49	< .001	
Item 6	.55	< .001	.49	< .001	
SI					
Item 7	.60	< .001	.55	< .001	.92
Item 8	.68	< .001	.62	< .001	
Item 9	.80	< .001	.76	< .001	
FC					
Item 10	.61	< .001	.56	< .001	.91
Item 11	.60	< .001	.55	< .001	
Item 12	.68	< .001	.62	< .001	
BI					.93
Item 13	.90	< .001	.84	< .001	
Item 14	.80	< .001	.76	< .001	
Item 15	.78	< .001	.73	< .001	

Validity

For convergent validity, correlation with Abbad's questionnaire was significant (r= 0.64, p< .01).

Ethical aspects

All students were informed of the purpose and survey of the study, and all respondents were asked to answer the questionnaire on a voluntary basis. Students provided their consent to participate in the study. Their participation was voluntary and they also had the right to withdraw at any time.

FINDINGS

Correlation

As shown in table 4, study variables showed significant correlation at the .01 level. BI correlates positively with PE, EE, SI and FC(r = .611, .630, .629 and .605 respectively)

Table 4
Correlation of study variables

	PE	EE	SI	FC	BI
PE	1.000				
EE	.667**	1.000			
SI	.588**	.711**	1.000		
FC	.594**	.655**	.633**	1.000	
BI	.611**	.630**	.629**	.605**	1.000

**Correlation is significant at the .01 level (2-tailed).

Regression Analysis

As shown in table 5, each of PE, EE, SI made significant individual contributions to the prediction of BI. The results indicated that the following beta weights which represented the relative contribution of PE, EE, SI and FC to the prediction were observed. PE (b = .366, t = 5.736, P < 0.01), EE (b = .354, t = 5.698, P < 0.01), SI (b = .282, t = 5.484, P < 0.01), and FC (b = .291, t = 5.247, P < 0.01). They together yielded a coefficient of multiple regression (R) of 0. 763 and a multiple correlation square of 0. 760. This shows that 76.0% of the total variance in BI of those who participated in the study is accounted for by the combination of PE, EE and SI.

Table 5
Regression of PE, EE, SI and FC on BI

	β	*t*-value
PE	.366	5.736***
EE	.354	5.698***
SI	.282	5.484***
FC	.291	5.247***
BI	.298	5.304***
R^2	.763	
Adjusted R^2	.760	

***$p < .001$

Test of model fit

As a result of the four -factor CFA, the fit indices were found to be Chi square = 632.50 (p < .001), degree of freedom = 210 ($\chi 2$ = 632.50; df = 120, $\chi 2$/df = 5.270), RMSEA= .07 (p < .05), SRMR = .05, CFI= .92, NNFI = .95, GFI = .95, and AGFI= .94. (Table 6.).

Table 6
Model fit indices from measurement models of the scale

Goodness of Fit Indexes	Measurement Model of the scale
χ2, df	632.50
χ2/df	5.27
CFI	.92
NNFI	.95
GFI	.95
AGFI	.94
RMSEA	.07
SRMR	.05

Structural Model

This step was intended to measure the proposed hypotheses. As shown in table 7, BI was positively impacted by PE, EE, SI and FC with p- value of 0.000 (<0.05) respectively. Thus, H1, H2 , H3 and H4 were Supported(see fig.2).

Table 7
Results of path and hypotheses tests

Hypotheses/	Relationships	Estimate	S. E	C.R	P	Comment	Label
H1	BI < --- PE	.300	.082	3.364	***	Sig.	Supported
H2	BI < --- EE	.293	.081	3.244	***	Sig.	Supported
H3	BI < --- SI	.298	.084	3.328	***	Sig.	Supported
H4	BI < --- FC	.310	.086	3.586	***	Sig.	Supported

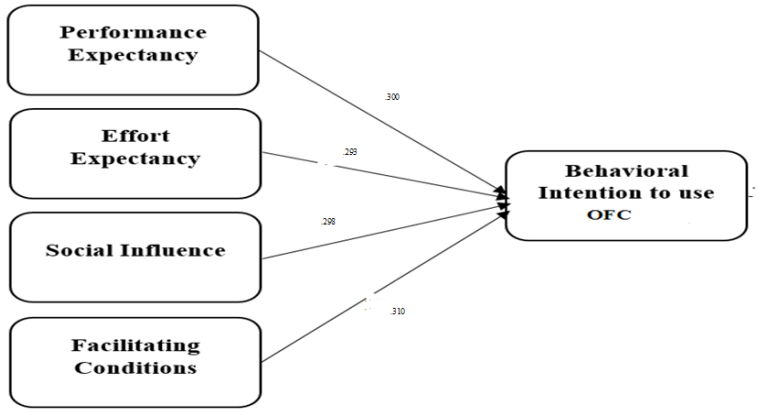

Figure 2
Results of Path and Hypotheses Tests

DISCUSSION

This study used the UTAUT model as the theoretical basis to assess and evaluate the use of online flipped classrooms during covid-19 by gifted students. Study variables showed significant correlation at the .01 level. BI correlates positively with PE, EE, SI and FC.

PE, EE, SI and FC together yielded a coefficient of multiple regression (R) of 0. 763 and a multiple correlation square of 0. 760. This shows that 76.0% of the total variance in BI of those who participated in the study is accounted for by the combination of PE, EE and SI. BI was positively impacted by PE, EE, SI and FC with p- value of 0.000.

PE was a true and influential predictor of BI. Student expects that using the system will help him /her to attain gains in academic works. This finding was supported by findings of previous research (e.g., Cheng-Min, 2019; Raffaghelli, Rodríguez and Guerrero-Rold´an,2022; Kim & Lee, 2020). As indicated by Venkatesh et al. (2003), the higher the student's PE, the stronger the BI and UI.

EE was an influential predictor of BI. Students found operation or system use easy enough that they enjoyed learning and were able to learn in a timely fashion and in in a good manner. This finding was supported by findings of previous research (e.g., Abd Aziz, Kader, and Ab Halim,2021; Tan, 2013; Raffaghelli, Rodríguez and Guerrero-Rold´an,2022; Kim & Lee, 2020).

SI was an influential predictor of BI. Students feel that their schools in particular and their society in general require them to use technology. They are motivated to do this, especially at times of crises like the one of covid-19 pandemic. Students value "other people's thought that they should use a technology (e.g., OFC).

Contrary to other researchers (e.g., Al-Shehri ,2017) who concluded that social influence did not have any meaningful effect on behavioral intention for adopting an e-learning system, though found that that performance expectancy, effort expectancy, and facilitating conditions had a positive impact influence on behavior intention to use e-learning system, FC, in this study seemed to be another predictor of BI.

It seems reasonable to assume that UTAUT could be used to asses students' intentions to sue OFC. This suggests that students wanted to use OFC because it helped them to improve their academic performance.

CONCLUSION

All the research hypotheses were supported. PE positively affects students' intentions to use OFC. EE positively affects students' intentions to use OFC. SI positively affects us students' intentions to use OFC. FC positively affects us students' intentions to use OFC.

E- learning is an electronic system that allows interaction between the teacher and the learner through a complete presentation of the educational content of the courses and lessons, in which modern communication mechanisms are used such as computers, networks and multimedia, including the composition of writing elements, images, music, sound, static and animated graphics and other elements, and there are also hypermedia, which are programs that rely on moving from one medium to another medium to provide information in another form or to a deeper and more detailed degree, in addition to using the internet to exchange information in the educational and teaching field and making it available for use via mobile phone anywhere, and the Internet and its knowledge circle can be accessed Huge stretching across continents.

Educational video, interactive video, and mail files can also be used. Students can also communicate with each other through newsgroups and live chat programs. This service allows speaking, conversation and exchanging instant messages between a number of users, all of these new educational technological innovations It allows the teacher to meet, discuss and live chat with his students from different places with The possibility of transferring and circulating information between the teacher and the learner in its various forms, and this technology effectively contributes to digitizing libraries, establishing virtual laboratories, giving lectures, holding educational seminars and remote workshops.

The research contributes to enriching the body of knowledge about UTAUT model. The results of this study are useful for educators and schools, and policymakers to plan and execute their online strategy and take necessary decisions to help students depend more and more on e-learning.

LIMITATIONS AND SUGGESTIONS

Because this study only examines OFC among gifted students, the results may not be generalized to other types of students (e.g., students with disabilities or even normal students), nor other types of E– system (tablets, WhatsApp…etc). Therefore, it is suggested that a future researcher validate the model and findings in other types of students (e.g., students with disabilities or even normal students), and other types of E– system (tablets, WhatsApp…etc).

DECLARATION OF CONFLICTING INTERESTS

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