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Adoption of Unified Theory of Acceptance and Use of Technology (UTAUT) Model in Online Course Delivery during Covid-19 Pandemic

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ABSTRACT

During the outbreak of covid-19, many universities around the world heavily depended on the line mode of delivering lectures. The lens of the study was in line with the perception of lecturers on the adoption of technological modes for course delivery during the covid-19 pandemic. The study was underpinned by the Unified Theory of Acceptance and Use of Technology (UTAUT) model. The path analysis from the structural model shows a strong positive correlation between performance expectancy (PE) and behavioural intention (BI); effort expectancy (EE) and BI; social expectancy (SE) and BI, facilitating conditions (FC) and use behaviour (UB), and BI and UB. However, lecturers' experiences significantly influence effort expectancy, but experiences have no influence on social expectancy or the facilitating conditions for the adoption of the UTAUT Model. On the other hand, gender differences in lecturers have an impact on PE, EE, and SE in the adoption of the UTAUT model. The age grouping of lecturers had an impact on EE and SE, but the age grouping did not have an impact FC on the adoption of the UTAUT Model. The study concluded that using a digital platform enhanced lecturers' delivery of online studies, whereas infrastructure development for ICT should be integrated into our course structure to ensure its voluntariness for use in SE. It was understood that the UTAUT model reduced stress because students were not having face-to-face lectures in school. The study also discovered that the covid-19 pandemic has influenced the evolution of technology in lecturers' teaching styles in recent years.

Keywords: Online Course Delivery, Covid-19 Pandemic, Technology, Universities, Ghana

INTRODUCTION

The resistance to online course delivery by faculty members could not stand the test of time due to the outbreak of covid-19 pandemic (Bailey, 2016; Hunt et al., 2014). The outbreak of the global pandemic (covid-19) and its influence on teaching and learning in higher education has influenced a dramatic shift in the educational system (Aristeidou & Cross, 2021; Sangeeta & Tandon, 2020; Zhang, Wang, Yang, & Wang, 2020); educational institutions had to shift from face-to-face education to online during the pandemic. Mukhtar, Javed, Arooj and Sethi (2020) established that the outbreak of covid-19 pushed institutions to invest in online learning because it offered convenient and productive modes to realise learning objectives. Technology made it easier for institutions to start online learning (Mukhtar, Javed, Arooj & Sethi, 2020) as it served as a remedy for the continuous delivery of education during the outbreak (Dhawan, 2020).

The covid-19 pandemic provided educational opportunities and technological advancements for individuals and institutions to respond to teaching and learning (Qiao et al., 2021; Sangeeta & Tandon, 2020). Amidst the consequences that covid-19 posed to education, it also helped spare the introduction of good technological concepts for teaching and learning

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that brought education close to one's doorstep (Bozkurt et al., 2020; Schleicher, 2020; UNESCO, 2020). Similarly, Qiao et al., (2021); Sangeeta and Tandon, (2020) believe that the COVID-19 crisis provided opportunities for education stakeholders to endorse online teaching and learning procedures for sharing knowledge with students.However, Saxena (2020) confirms that covid-19 motivated educational institutions to adopt online teaching and learning systems where teachers/lecturers were exposed to different learning platforms such as Microsoft Teams, Google Hangouts, Zoom, WhatApp, Facebook Live, and others. This knowledge-sharing and transfer system helped to conduct classes smoothly, which facilitated effective learning.

The adaptation of technology by educational institutions has aided the process of teaching and learning because of the changing trends in all aspects of life due to covid-19 pandemic. When students are studying online, the adaptation of this technological system has made teaching and learning freely accessible and instantly available to them with a click of the mouse (Vaportzis, Giatsi, Clausen, & Gow, 2017; Zawacki-Richter & Latchem, 2018). Previously, educational institutions taught in the traditional manner, but they have now shifted to hybrid or fully online learning (Alharbi & Drew, 2014). According to Liu, Ludu, Klein, Spector, and Ikle (2017), educational institutions worldwide have made a significant shift away from traditional modes of learning and toward online learning, making online learning education now an option for earning a degree without physically being present on campus.

The quest to teach and learn effectively during the covid-19 pandemic era saw the introduction of various technologies models being adopted by educational institutions such as Social Cognitive Theory (SCT) (Bandura, 1986), the Technology Acceptance Model (TAM) (Davis, 1989), the Theory of Planned Behavior (Ajzen, 1991), extended TAM (Venkatesh & Davis, 2000), the model combining TAM and the Theory of Planned Behavior (Taylor & Todd, 1995), and the Model of PC Utilization (Thompson, Higgins, & Howell, 1991) and UTAUT and UTAUT2 (Venkatesh et al., 2003; Venkatesh, Thong, & Xu, 2012). To explain staff technology acceptance and use, we adapted the Unified Theory of Acceptance and Use of Technology (UTAUT) model. It has since served as a foundation theory for the investigation of numerous technologies in both organizational and non-organizational settings (Evwiekpaefe, Chiemeke & Haruna, 2018; Jakkaew & Hemrungrote, 2017; Venkatesh, Thong & Xu, 2012).

The UTAUT model was formulated under four elements which include performance expectancy, effort expectancy, social influence, and facilitating conditions. To assess the effectiveness of these variables under the UTAUT model, we consider certain key moderating variables like (gender, age, experience and voluntariness of use) which may directly or indirectly influence one's intentions to use the technology. However, the four key elements have a direct impact on our behavioural intention to use the system when it is available (Abu-Al- Aish & Love, 2013). Figure 1 explains the determinants and moderators of variables in the study.

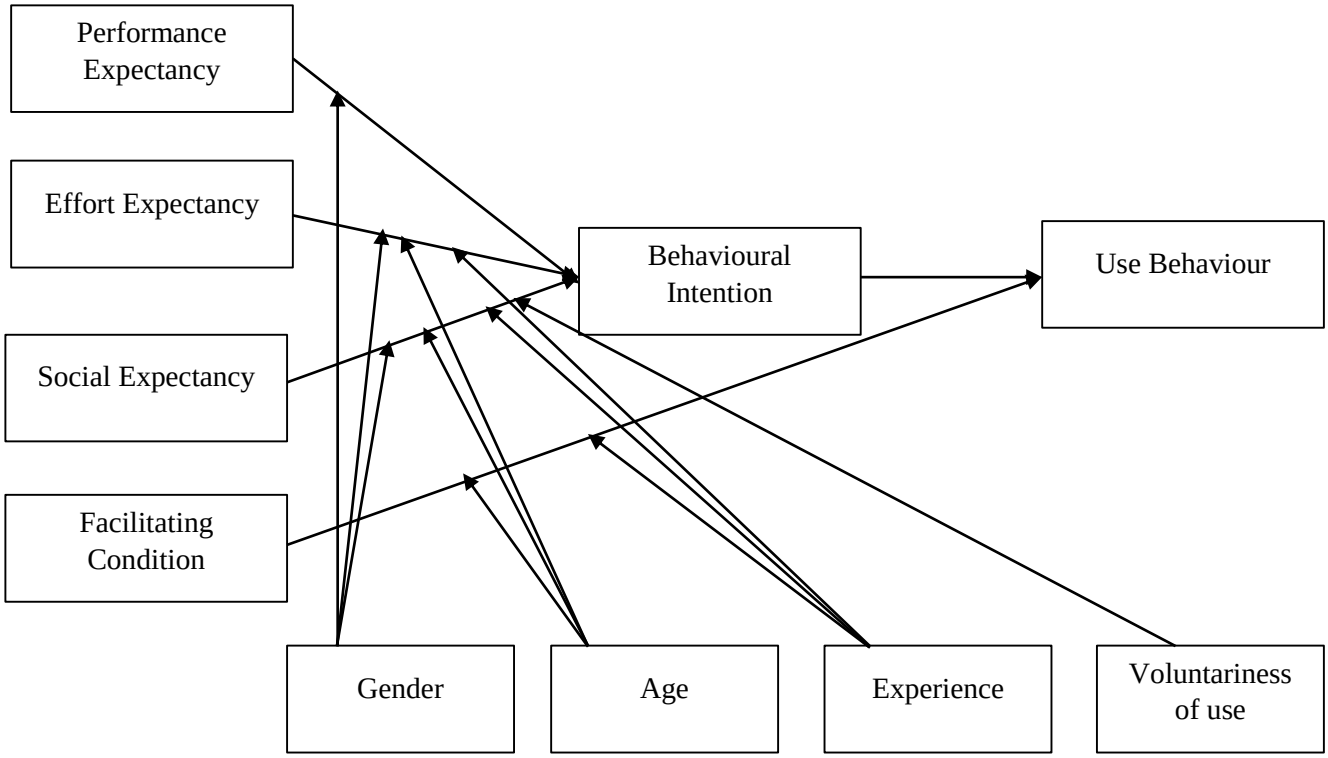

Figure 1: Conceptual framework explaining the determinants and moderators of variables used in the study
Source: Evwiekpaefe, Chiemeke and Haruna (2018)

DETERMINANTS AND MODERATOR'S RELATIONSHIP WITH RESEARCH STUDY

Performance Expectancy

The first determinant, according to Venkatesh, Morris, Davis, and Davis (2003), was performance expectancy (PE), which was the belief of how the system or systems would benefit the individual in terms of skill acquisition or job performance. Even though the model was initially designed for the organisational context, this concept can be used to understand if users believe that technology used for online academic work will improve their performance. In addition, the concept can also improve the online academic work and performance of students and the teaching methods of lecturers in educational institutions. Thus, performance expectancy (PE) will be employed to discover the benefits of online system usage during covid-19, if it aids learning or discourages it (leading to frustrations), especially, in terms of internet connectivity and its influence on lecturers' academic work since internet connectivity services are not the best in Ghana.

Performance expectancy helps to discover and understand lecturers' perceptions about the helpfulness and usability of the online platform for course delivery. It is argued that behavioural intention to use information technology is a direct determinant or the strongest predictor of performance expectancy (Abu-Al-Aish & Love, 2013; Raman, Don, Khalid, & Rizuan, 2014). Also, constructivist instruction demands that lecturers use learning technologies because they encourage knowledge construction, knowledge sharing, and problem-solving (Testa & Tawfik, 2017). This determinant helps discover the behavioural intentions of users. Performance expectancy can also help understand if lecturers perceive that there is an enhancement in productivity in terms of the construction of new knowledge, and its usefulness to online delivery systems for users (Mejia, 2015).

Effort Expectancy

The effort expectancy determinant highlights the degree of ease with which technology is used. Effort Expectancy can be used to investigate whether lecturers believe that the technology will be simple to use, how easily lecturers can use the technology for online academic work, and how user-friendly the online delivery systems will be for academic work. The study explores the construct of stress-free interaction with lecturers and peers through the use of technology on an online delivery service during Covid-19 pandemic (Abu-AL-Aish & Love, 2013; Mejia, 2015). The study also investigates the significance of lecturers' experience using technology for academic work. This construct can also be used to investigate the barriers to the convenience of using online course delivery in Ghana, as some lecturers are yet to use online technology systems for the first time for their academic work.

Social Influence

The third determinant focuses on other lecturers' trust in his/her ability to use new technology. It is also believed that when using new technology, people should have made recommendations. Social influence directly determines an individual's behavioural intention to use new technology. This social influence factor can be used to determine whether lecturers are using the online delivery system because other faculty members may be using the technology, which may influence them to use it (Sezer & Yilmaz, 2019).

Facilitating Conditions

The fourth determinant in the UTAUT is facilitating conditions (FC), which is defined as an individual's belief that organisational and technical structures exist to support the use of a system or technology. Facilitating conditions can be used to explore and verify the availability of technology, the knowledge users must have in order to operate the system during covid-19 pandemic (e.g., learners' knowledge and perceptions of the availability of resources and support services and the influence of these on their learning), whether users received training before they began using the technology, and whether proper support is provided to lecturers at the university (Evwiekpaefe, Chiemeke & Haruna, 2018:191; Venkatesh, Thong & Xu, 2012:159).

Relationship between Determinants and Variables

The four determinants (performance expectancy, effort expectancy, facilitating conditions, and social influence, all of which have a direct link with behavioural intentions) tend to influence user behaviour. The moderating variables are linked to these determinants in order to understand the influence on the individual's usage intention and behaviour when using online technology. The moderating variables can aid in understanding the influence of individual differences and attitudes on behavioural intentions to use technology.

From Figure 1 gender was influencing performance expectancy, effort expectancy, and social influence, while performance expectancy, effort expectancy, social influence, and facilitating conditions also had an influence on age. However, voluntariness of use was influenced by social influence, effort expectancy, and facilitating conditions, and finally, experience influences and is influenced by social influence (Evwiekpaefe, Chiemeke & Haruna, 2018). Their study investigated these moderating variables (gender, age, experience, and voluntariness of use), which are also socio-demographic characteristics, to see how they influenced lecturers' knowledge on determinant variables.

In this study, the UTAUT model would be used to explore and understand the drivers of technology adoption and its influence on course delivery during the covid-19 pandemic. The UTAUT model will again be used to infer individual users' technology acceptance in an

environment such as educational institutions (Evwiekpaefe, Chiemeke & Haruna, 2018, Raman, Don, Khalid & Rizuan, 2019).

Investigating the existence of each determinant in the natural environment will enable us to explore and better understand the individual intention of using the online course delivery system and key factors that influence individual acceptance and usage (Williams, Rana, & Dwivedi, 2015). Using the UTAUT model's determinants and moderators will assist in exploring and validating both the intrinsic and extrinsic factors (decisions, intentions, attitudes, perceptions, individual satisfaction/benefits, expectations, support services, and challenges) that influence lecturers' acceptance and use of technology during the covid-19 pandemic (Evwiekpaefe, Chiemeke, & Haruna, 2018).

This study used these moderators, to explore how they influence user behaviour. The four moderators will be used to verify how they influence and are also influenced by the four determinants. As a result of this explanation, we investigated lecturers' perceptions of how the UTAUT model aided online course delivery during the COVID-19 pandemic.

Hypotheses

We developed the following hypotheses based on the conceptual framework.

1. Does performance expectancy positively influence behavioural intention.
2. Does effort expectancy positively influence behavioural intention.
3. Does social expectancy positively influence behavioural intention.
4. Does facilitating condition positively influence use behaviour.
5. Does behaviour intention positively influence use behaviour.
6. Are there differences between gender in terms of performance expectancy, effort expectancy and social expectancy.
7. Are there differences between age in terms of effort expectancy, social expectancy and facilitating conditions.
8. Is there a difference between experience in terms of effort expectancy, social expectancy and facilitating conditions.
9. Is there a difference between voluntariness of use in terms of social expectancy?

METHODS

The study was underpinned by quantitative research approach where three (3) premier universities (University of Ghana (UG), Kwame Nkrumah University of Science and Technology (KNUST) and University of Cape Coast (UCC) in Ghana were selected as the study area. After in-depth review of literature, we adopted the modified UTAUT model validated survey instrument by Dwivedi et al. (2019). We also modified the scale items from Venkatesh et al. (2003). The initial scale from Venkatesh et al. (2003) was a five-point Likert scale but we modified their scale to a four-point Likert scale. The abridged of this UTAUT model helped us to understand the perception of lecturers on online course delivery during covid-19 pandemic. Lecturers from these universities form the population of the study ie University of Ghana, Kwame University of Science and Technology and University of Cape Coast. On the issue of sampling, we developed questionnaires on a google form where the instrument was sent to the institutional email of lecturers in these universities. After four weeks, 239 lecturers responded to the questionnaires. The sample size recorded from each university is as follows: University of Ghana-81, Kwame Nkrumah University of Science Technology-86 and University of Cape Coast-72. Prior to the data collection, ethical approval was sought from the universities.

Table 1: Distribution of Respondents Data

Category	Distribution	Frequency (N)	Percentage (%)
Gender	Male	198	83
	Female	41	17
Age	41-50	124	50
	30-40	86	32
	51-60	29	18
Experience	11-20	153	64
	1-10	71	26
	21-above	15	10
Voluntariness of use	Moderate volunteer-driven	109	46
	Low volunteer-driven	99	41
	High volunteer-driven	31	13

Source: Field data (2021)

From Table 1: there was a fair analysis of respondents' background data across gender, age grouping, experience in learning online during Covid-19 pandemic and their voluntariness to use the system. A detailed explanation of each variable can be found in Table 1. The analytic process of the hypotheses was done with three different analytical approaches. The statistical tool used were structural equational model, independent sample T-test and one way analysis of variance (ANOVA).

Table 2: Measurement Model of the Study

Statement	**Mean**	**SD**	**Std. Error**	**Critical Ratio**	**Average Variance**	**Composite Reliability**
Performance Expectancy						
I prefer to teach online during Covid-19 outbreak because I can have access to students at their own distant location.	3.82	0.65	0.07	17.56	0.63	0.81
I prefer to teach online during the outbreak of Covid-19 pandemic because it helps me to utilize the time effectively.	3.78	0.51	0.05	18.11		
I prefer to teach online during the outbreak Covid-19 Pandemic because it saves time as students can continue participating in discussion sections and lectures without coming to classroom for face-to-face.	3.52	1.01	0.08	15.19		
I prefer to teach online during the outbreak of Covid-19 Pandemic because it helps me to reach my students within the shortest time-frame.	3.12	1.32	0.07	17.75		
Mean of Means	***3.56***	***0.87***				
Effort Expectancy						
It was easy for me to deliver online lectures for students during Covid-19 era.	3.62	o.87	0.08	14.87	0.57	0.75
It was easy to participate in discussions during an online class during Covid-19 era.	3.57	0.41	0.06	15.45		
I was able to solve the problems for students easily during an online class during Covid-19 era.	3.32	0.17	0.08	18.93		
The language used by students during online class was easy to understand.	2.82	1.09	0.09	13.24		
It was easy to customize the lectures online during Covid-19 era.	2.65	0.11	0.14	17.82		
Mean of Means	***3.20***	***0.53***				
Facilitating Conditions						
I have the necessary knowledge and skill to deliver online lecture.	3.98	0.16	0.14	12.87	0.68	0.79

Delivering lectures online is compatible with other technologies I use.	3.62	0.34	0.06	15.81		
I have been provided with resources necessary to deliver online class by my university.	3.23	0.25	0.08	16.45		
I get help from my university when I face difficulties while delivering lecture online.	3.01	0.58	0.06	14.27		
Mean of Means	***3.46***	***0.33***				
Social Influence						
My colleagues were of the view that I should teach online during Covid-19 era.	3.95	0.17	0.07	17.83	0.58	0.85
My colleagues and peers think that I should adopt online mode of teaching during Covid-19 era.	3.71	0.36	0.15	14.29		
People who are important to me think that I should adopt online teaching during Covid-19 era.	3.65	0.52	0.09	15.67		
Mean of Means	***3.77***	***0.35***				
Behavioural Intention						
I intend to teach online during the outbreak of Covid-19 and even continue in the future.	3.82	0.44	0.05	17.92	0.68	0.75
I intend to encourage my peers and colleagues to adopt online teaching even after Covid-19.	3.76	0.53	0.09	16.71		
I intend to adopt online teaching in my daily routine also to enhance the safety of students crowded in lecture hall.	3.71	0.51	0.18	18.73		
Mean of Means	***3.76***	***0.49***				
Use Behaviour						
I used online teaching frequently during Covid-19 era.	3.71	0.31	0.03	17.93	0.58	0.87
I used online teaching to share my content, quiz, assignments and end of semester examination with students during Covid-19 era.	3.61	1.06	0.07	16.62		
I am used to online teaching than face-to-face even after Covid-19 era.	3.42	0.87	0.16	17.25		
Mean of Means	***3.58***	***0.75***				

Source: Adapted from Venkatesh et al. (2003)

Table 2 shows the measurement model of the study. From Table 2, the overall mean of the means value from the "Performance Expectancy" recorded is M = 3.56, SD = 0.87, which shows a high response rate on the perception of lecturers on how the adoption of the UTAUT model aids online course delivery during the covid-19 pandemic. However, the scale under performance expectancy shows that "I prefer to teach online during Covid-19 outbreak because I can have access to students at their own distant location" recorded a mean and standard deviation score of (M=3.82, SD = 0.65, and StD Error = 0.07). On the same theme, referring to performance expectancy on Table 2. The mean, standard deviation, and standard deviation error scores of (M = 3.78, SD = 0.51, and StD Error = 0.08) represent "I prefer to teach online during the outbreak of Covid-19 pandemic because it helps me to utilise the time effectively" and "I prefer to teach online during the outbreak Covid-19 pandemic because it saves time as students can continue participating in discussion sections and lectures without coming to classroom for face-to-face." score a second and third frequent rate on performance expectancy based on how lecturers adopt the UTAUT model to aid online course delivery during covid-19 pandemic. However, respondents' comments on "I prefer to teach online during the outbreak of Covid-19 pandemic because it helps me to reach my students within the shortest time-frame" recorded the last mean and standard deviation under performance expectancy with the Mean= 3.12, SD=1.32 and StD Error= 0.07.

From Table 2 overall mean and standard deviation values from the "Effort Expectancy" recorded are (M=3.20, SD=0.53) which shows a high response rate on the perception of the degree with ease with the use of technology on how the adoption of UTAUT model aid online course delivery during covid-19 pandemic by lecturers. However, the scale under "Effort

Expectancy" shows that "It was easy for me to deliver online lectures for students during Covid-19 era" recorded mean, standard deviation, and standard deviation error scores of 3.62, 0.87 and 0.08 respectively. On the same theme referring to Effort Expectancy on Table 2, the mean, standard deviation and standard deviation error scores of (M=3.57, SD=0.41 and StD Error= 0.06) and (M=3.32, SD=0.17 and StD Error= 0.08) representing "It is easy to participate in discussions during an online class during Covid-19 era" and "I was able to solve the problems for students easily during an online class during Covid-19 era" score second and third frequent rate on effort expectancy on how lecturers adopt the of UTAUT model to aid online course delivery during covid-19 pandemic respectively. Respondents' comments on "The language used by students during online class was easy to understand" and "It was easy to customise the lectures online during Covid-19 era" recorded mean, standard deviation, and standard deviation error under effort expectancy of (M=2.82, SD=1.09 and StD Error= 0.09) and (M=2.65, SD=0.11 and StD Error= 0.4) respectively.

From Table 2, the overall mean and standard deviation values for the "facilitating conditions" recorded were M = 3.46 and SD = 0.33, respectively. This is based on the technical structures that support the use of technology on how the adoption of UTAUT model aid online course delivery during covid-19 pandemic. However, the scale Facilitating Conditions shows that "I have the necessary knowledge and skill to deliver online lecture" and "Delivering lectures online is compatible with other technologies I use" recorded mean, standard deviation and standard deviation error values of (M=3.98, SD=0.16 and StD Error= 0.14) and (M=3.62, SD=0.34 and StD Error= 0.06) respectively. Respondents' comments on the same theme referring to Facilitating Conditions on Table 2, the mean, standard deviation and standard deviation error score of (M=3.23, SD=0.25 and StD Error= 0.08) and (M=3.01, SD=0.58 and StD Error= 0.06) representing "I have been provided with resources necessary to deliver online class by my university" and "I get help from my university when I face difficulties while delivering lecture online" score third and fourth frequent rate on facilitating conditions on how lecturers adopt the of UTAUT model to aid online course delivery during covid-19 pandemic respectively.

On the scores of social influence, which highlights the believe other lecturers have on using the new technology, the overall mean and standard deviation values were 3.77 and 0.35 respectively. From Table 2, respondents' comments of the theme of social influence scale on, "People whose opinions I should teach online during Covid-19 era" and "My colleagues and peers think that I should adopt online mode of teaching during Covid-19 era" recorded values of (M=3.95, SD=0.17 and StD Error= 0.07) and (M=3.71, SD=0.36 and StD Error= 0.15) respectively. However, the scale on "People who are important to me think that I should adopt online teaching during covid-19 era" recorded values of M=3.65, SD=0.52 and StD Error= 0.09.

Furthermore, on the theme of Behavioural Intention, from Table 2 recorded an overall mean and standard deviation of 3.76 and 0.49 respectively. Respondents comments on this on the scales, "I intend to teach online teaching during outbreak of Covid-19 and even continue in the future", recorded values of (M=3.82, SD=0.44 and StD Error= 0.05), "I intend to encourage my peers and colleagues to adopt online teaching even after Covid-19", recorded values of (M=3.76, SD=0.53 and StD Error= 0.09) and "I intend to adopt online teaching in my daily routine also to enhance the safety of students crowded in lecture hall" recorded values of (M=3.71, SD=0.51 and StD Error= 0.18).

Lastly on the theme of Use Behaviour with an overall mean and standard deviation values of 3.58 and 0.75 respectively. This shows a high response rate regarding the perception of how the adoption of the UTAUT model aid online course delivery during covid-19 pandemic by lecturers. Respondents' comments on the various scales under this theme recorded values of, "I used online teaching frequently during covid-19 era" (M=3.71, SD=0.31 and StD Error= 0.03),

"I used online teaching to share my content, quiz, assignments and end of semester examination with students during covid-19 era" (M=3.1, SD=1.6 and StD Error= 0.07) and "I am used to online teaching than face-to-face even after Covid-19 era" (M=3.42, SD=0.87 and StD Error= 0.16).

Table 3: Correlations Matrix

	Performance expectancy	**Effort expectancy**	**Facilitating conditions**	**Social influence**	**Behavioural intention**	**Use behaviour**
Performance expectancy	***.713***					
Effort expectancy	.391**	***.762***				
Facilitating conditions	.542**	.621**	***.711***			
Social influence	.462**	.421**	.651**	***.742***		
Behavioural intention	.523**	.387**	.761**	.457**	***.781***	
Use behaviour	.342**	.650**	.423**	.578**	.472**	***.787***

Note: Correlation is significant at the .05 level (2-tailed).
Source: Field data (2021)

Table 4: Structural Model

No.	**Hypothesis**			**Std. loading**	**Std. error**	**Critical ratio**	***p***	**Outcome**
H1	Performance expectancy (PE)	→	Behavioural intention (BI)	0.39	0.65	3.67	0.03***	Supported
H2	Effort expectancy (EE)	→	Behavioural intention (BI)	0.47	0.45	1.78	0.01***	Supported
H3	Social expectancy (SE)	→	Behavioural intention (BI)	0.64	0.26	4.82	0.02***	Supported
H4	Facilitating condition (FC)	→	Use behaviour (UB)	0.54	0.36	2.71	0.01***	Supported
H5	Behaviour intention (BI)	→	Use behaviour (UB)	0.22	0.43	2.12	0.04***	Supported

Note: ** significant at p=0.05
Source: Field data (2021)

Table 3 provides correlation matrix of the study. The matrix analysis shows that all the variables recorded a positive correlation among themselves. However, Table 4 examines the structural model. The theoretical association between the concepts show a significant correlation between the variables. From Table 4, the results show that there was strong correlation between the variables. The path analysis from the structural model shows strong positive correlation from PE to BI, EE to BI, SE to BI, FC to UB and BI to UB with a p-value between 0.01 to 0.04. The overall, analysis provided in the study support proposed claims. The study concludes with the understanding that there is intricate relationships among performance expectancy, effort expectancy, social influence, facilitating conditions, behavioural intention, and online course delivery during covid-19 pandemic.

Table 5: Independent Sample T-Test for Gender and Performance, Effort and Social Expectancy

Category	Variable	N	Mean	SD	*F*-ratio	*t*-value	Conformation	Conclusion	Eta
Performance expectancy	Male	198	58.23	3.89	7.314	-6.238	0.03***	H_A Accepted	0.004
	Female	41	41.76	2.08					
Effort expectancy					3.251	4.982	0.01***	H_A Accepted	0.004
Social expectancy					2.764	-5.874	0.05***	H_A Accepted	

Note: ** significant at p=0.05.
Source: Field data (2021).

Table 6: Summary of ANOVA: Age between Effort Expectancy (EE), Social Expectancy (SE) and Facilitating Conditions (FC)

Category	Variable	Descriptive statistics			Summary of ANOVA					Post Hoc			
	Age	N	Mean	SD	Sum of Squares	df	*F*-ratio	Mean square	sig	Variables (I) Age	(J) Age	sig	Eta
EE	30-40	86	52.11	3.76									
	41-50	124	49.15	4.14									
	51-60	29	34.73	2.95									
	Between groups				474.491	3	4.641	143.164	0.03	30-40	51-60	0.01***	0.19
	Within groups				1985.038	236		17.038					
	Total				**2459.529**	**239**							
SE	Between groups				782.604	3	3.872	423.015	0.01	30-40	51-60	0.00***	
	Within groups				3986.125	236		12.624		30-40	41-50	0.04***	0.16
	Total				**4768.729**	**239**							
FC	Between groups				159.912	3	2.415	215.179	0.07				
	Within groups				3413.973	236		24.122					
	Total				**3573.885**	**239**							

Note: ** significant at p=0.05
Source: Field data (2021).

Table 5 recorded a different descriptive mean score for male and female. The male respondents were 198 (M=58.23, SD=3.89) while female respondents were 41 (M=41.76, SD=2.08). An independent-sample T-test was conducted to compare gender and performance expectancy, effort expectancy and social expectancy. Table 5 shows *sig. values of* 0.03, 0.01 and 0.05 which was lesser than p=0.05. This evident show that the data has violated the assumption of equal variance. We used the equal variance not assumed figures to interpret the findings. Table 5 shows that there was a significant difference in scores for male and performance expectancy with a value (M=58.23, SD=3.89) while female and performance expectancy (M=41.76, SD=2.08; t (-6.238) =-7.314, p = .05, two-tailed). In the same vein, effort expectancy recorded t (4.98) = 3.251 for effort expectancy while social expectancy t (-5.874) = 2.764. From the results found in Table 5, the alternate hypothesis stated as "There is a significant difference between gender and performance, effort expectancy and social expectancy" provided was accepted.

From Table 6, ages between 30-40 recorded 86 (M=52.11, SD=3.76). However, age grouping 41-50 and those between 51-60 scored second and third respectively with the mean score of (M=49.15, SD=4.14, N=124) and (M=34.73, SD=2.95, N=29). However, we conducted the One-way analysis of variance (ANOVA) to check if the descriptive statistics of the study variables found in Table 6 did not happen by chance. Table 6 explains the summary of one-way analysis of variance on age grouping between effort expectancy (EE), social expectancy (SE) and facilitating conditions (FC). The F-ratio for the one-way ANOVA was significant with a p-values of 0.03, 0.01 and 0.07. From Table 6 the F-ratio for effort expectancy (4.641), social expectancy (3.872) and facilitating conditions (2.415) was

significant at the alpha level 0.05. We accepted the alternate hypothesis stated as "There is a significant difference between age grouping, effort expectancy and social expectancy" but the age grouping between facilitating conditions recorded a null hypothesis stated as "There is no significant difference between age grouping and facilitating conditions" was rejected.

Table 7: Summary of ANOVA: Experience between Effort Expectancy (EE), Social Expectancy (SE) and Facilitating Conditions (FC)

Category	Variable	Descriptive statistics			Summary of ANOVA					Post Hoc			
	Experience	N	Mean	SD	Sum of Squares	df	*F*-ratio	Mean square	sig	Variables (I) Exp	(J) Exp	sig	Eta
EE	11-20	153	56.73	4.12									
	1-10	71	48.42	3.57									
	21-Above	15	41.04	3.01									
	Between groups				613.029	3	2.568	35.079	0.05	11-20	1-10	0.00***	0.15
	Within groups				3390.457	236		32.157		11-20	21-above	0.01***	
	Total				**4003.486**	**239**							
SE	Between groups				65.267	3	1.145	18.015	0.35				
	Within groups				2288.892	236		17.624					
	Total				**2354.159**	**239**							
FC	Between groups				87.257	3	1.692	15.680	0.12				
	Within groups				1704.162	236		19.634					
	Total				**1791.419**	**239**							

Note: ** significant at *p*=0.05
Source: Field data (2021).

Table 8: Summary of ANOVA: Voluntariness of Use and Social Expectancy (SE)

Category	Variable	Descriptive statistics			Summary of ANOVA				
	Voluntariness of use	N	Mean	SD	Sum of Squares	df	*F*-ratio	Mean square	sig
SE	Low volunteer-driven	99	53.82	3.82					
	Moderate volunteer-driven	109	50.12	3.61					
	High volunteer-driven	31	44.37	2.83					
	Between groups				281.172	3	2.136	17.154	0.11
	Within groups				2144.231	236		19.279	
	Total				**2425.403**	**239**			

Note: ** significant at *p*=0.05
Source: Field data (2021).

Table 7 shows if there is difference between experience and Effort expectancy (EE), Social expectancy (SE) and Facilitating conditions (FC). At the descriptive section, it was shown that experience between 11-20 recorded 153(M=56.73, SD=4.12) while lecturers with 1-10 experiences recorded 71(M=48.42, SD=3.57), experience from 21 and above recorded 15 with a mean (41.04) and standard value (3.01). From Table 7, it was shown that there was a significant difference between experience EE but there was no significant difference between experience and SE and FC. However, Table 8 shows that we accepted the null hypothesis stated as "There is no significant difference between voluntariness of use and social expectancy". The *F*-ratio for the one-way ANOVA was not significant because Table 8 recorded a *p*-value of 0.11.

DISCUSSION

The adoption of the Unified Theory of Acceptance and Use of Technology (UTAUT) Model in online course delivery during the covid-19 pandemic was an effective technique to

use technology in teaching during the covid-19 period. This technological paradigm proved to be an effective instrument for facilitating effective teaching and learning during the covid-19 pandemic. The technological skills acquired during the period helped lecturers to share their lesson notes and academic delivery online through Skype call, zoom call, google meeting, WhatsApp, Google Classroom and Microsoft Teams etc. These digital technological platforms have become beneficial to institutions during and after covid-19 pandemic. These digital technological modes have helped most universities to run most postgraduate programmes and supervision of assessments online.

Nikou and Economides (2019) studies help to impact the understanding of teachers' perceptions on validating the TAM model, whereas Dwivedi et al. (2019) and Qiao et al. (2021) used the UTAUT to explore literature on validating attitudes. The current study opines on the perceptions of lecturers on how the adoption of the UTAUT model aid online course delivery during covid-19 pandemic.

Concerning how performance expectations may influence behavioural intention, According to Venkatesh, Morris, Davis, and Davis (2003), the system or systems will help individuals in terms of skill acquisition or job performance. Even though the model was originally designed for the organisational context, this concept can be utilised to determine whether users believe that using technology for online academic work will alter behavioural intentions. In addition, the concept can also improve the online academic work and performance of students and the teaching methods of lecturers in educational institutions. Thus, performance expectancy (PE) employed to discover the benefits of online system usage during Covid-19 pandemic, if it aids learning or discourages it (leading to frustrations), especially, in terms of internet connectivity and its influence on lecturers' behavioural intentions on academic work since internet connectivity services are not the best in Ghana. Performance expectancy helps to discover and understand lecturers' perceptions about the helpfulness and usability of the online platform for course delivery. It is argued that behavioural intention to use information technology is a direct determinant or the strongest predictor of performance expectancy (Abu-Al-Aish & Love, 2013; Raman, Don, Khalid, & Rizuan, 2014).Also, constructivist instruction demands that lecturers use learning technologies because they encourage knowledge construction, knowledge sharing, and problem-solving (Testa & Tawfik, 2017). This determinant helps discover the behavioural intentions of users. Performance expectancy can also help understand if lecturers perceive that there is an enhancement in productivity in terms of construction of new knowledge, and the usefulness of online delivery system for users (Mejia, 2015).

However, on how effort expectancy positively influences behavioural intention shows that lecturers believe that the technology was simple to use, and it influences their online academic work. It was also discovered that during the COVID-19 pandemic, effect expectancy influences behavioural intention when accessing the digital platform. In addition, the Abu-AL-Aish and Love (2013) and Mejia (2015) studies investigate how stress-free interaction with lecturers and peers is achieved through the use of technology on the online delivery service during the COVID-19 pandemic. The study also explores the importance of the experience of using technology for academic work to lecturers. Again, Bansal and Joshi (2014) and Pana et al. (2013) found that 75% of WhatsApp users positively influenced teaching and learning behaviour in universities.

Social expectancy also has a positive influence on behavioural intention because it highlights that most lecturers hold the opinion that they should teach online during Covid-19 era and adopt new technological methods of teaching online. Sezer and Yilmaz (2019) study that social influence directly determines an individual's behavioural intention to use new technology.

The study shows that due to Covid-19 pandemic lecturers were given the necessary education about how to use digital platforms to enhance their teaching. Facilitating conditions was used to explore and verify the availability of the online delivery system, where knowledge users operate the system. In support, Evwiekpaefe, Chiemeke and Haruna (2018) and Venkatesh, Thong and Xu (2012) believe that lecturers' knowledge and perceptions about the availability of resources to help initiate or support services that influence learning influence whether lecturers received training before the start of online delivery system. It was also revealed that making technology simple and low-cost would drive most lecturers to adopt technology (Bouhnik & Deshen, 2014). Bouhnik and Deshen (2014), Gon and Rawekar (2017) and Tseng et al. (2019) reveal the key concept on facilitating conditions is the availability of a knowledgeable person to allow learning to take place at all times.

The independent T-test analysis revealed that there was a significant difference between gender and performance expectancy, effort expectancy and social expectancy of lecturers during Covid-19. For the independent T-test result, the individual sig. values of the items are 0.03, 0.01 and 0.05, which is less than $p = 0.05$.

The summary of one-way analysis of variance on age grouping between effort expectancy (EE), social expectancy (SE) and facilitating conditions (FC). The one-way ANOVA F-ratio was significant, with p-values of 0.03, 0.01 and 0.07.The alternate hypothesis stated as "There is a significant difference between age grouping between effort expectancy and social expectancy" but the age grouping between facilitating conditions recorded a null hypothesis stated as "There is no significant difference between age grouping and facilitating conditions" was rejected. Meaning that the age grouping of lecturers has an effect on lecturers' effort expectancy and social expectancy during the COVID-19 era, but the age grouping of lecturers has no effect on facilitating conditions.

From the study, it was shown that there was a significant difference between lecturers' experience and effort expectancy, but there was no difference between lecturers' experience and social expectancy or facilitating conditions. We believe that lecturers with enough experience were of the view that introducing technology during the covid-19 period could help ease pressure, which enhanced their academic work. This is because the introduction of the technology was user-friendly. But on the contrary, we could conclude that the experiences of lecturers have no impact on their social influence and facilitating conditions for using technology. This was because lecturers' experiences indicate they have no behavioural intention about the ability to use new technology. Again, it was revealed that the lecturers' experience had no impact on the facilitating conditions. Meaning, lecturers may have the experience, but the facilities or conditions required to operate are not available, so they are unable to deliver an online system.

STRENGTHS AND LIMITATIONS

It was worth acknowledging the strength of the study. The study was representative, whereas the findings can be generalised to all institutions in Ghana. The adoption of the UTAUT model will help to analyse the change in behavioural intention of lecturers during covid-19 pandemic. The descriptive survey design employed in the study was done with qualified and well-trained university staff who assisted with the data collection process. We employed advanced statistical methods to analyse the data. The study supported the idea that financial support and social influence could be external factors that could help in the technological update of the model.

Notwithstanding the strengths of the study, the descriptive survey design does not allow us to make causal interpretations of the findings. Again, the self-reported data can have the possibility of being recalled. Finally, social desirability biases cannot be overlooked.

PRACTICAL IMPLICATIONS

The training of counsellors should also focus on various technological models to effectively assist them in helping other lecturers on their career paths to accept technological change in their lesson delivery.

The Ministry of Education and other established agencies, should create a social support system like the building of good ICT training centres on various university campuses to help the technological development of lecturers in their teaching and learning processes.

The adoption of the UTAUT model is an insight to promote new technological skills, so technological developers are required to evaluate the external factors that could affect the establishment of digital technological immersion. Because social influence can cause unexpected collapses of technological adoption, the government should provide funds to support the adoption of new technological developments.

THEORETICAL IMPLICATIONS

The theoretical framework was conceptualised using the Unified Theory of Acceptance and Use of Technology (UTAUT) model. The theory was essential for helping lecturers adapt to digital technological changes during the covid-19 pandemic. The theory established that the most efficient and effective way of adopting technological changes largely depends on mind renewal and infrastructure expansion, which help the individual to accept the change. During and after covid-19 pandemic, most educational institutions are still using the UTAUT model because it perceives an effective and efficient way of engaging students in online education due to the flexibility attached to it. The social isolation created during the covid-19 lockdown period was not felt by the institutions that adopted this technological model. The adaptation of the UTAUT model reduced stress from students' learning activities since they were not having face-to-face interaction with their lecturers but were able to complete their academics on time through this online model. Finally, most lecturers are still enjoying this technology platform because the training they received during the covid-19 pandemic has made the evolution of technology embedded in their thinking throughout their teaching and learning in recent time.

CONCLUSION

This study demonstrated how lecturers perceive the adoption of the UTAUT model to aid online course delivery during the covid-19 pandemic. The findings revealed that performance expectancy, effort expectancy, and social expectancy positively influence behavioural intention. The perceptions lecturers have of performance expectancy, effort expectancy, and social expectancy positively influence behavioural intention, which eases the adaptation and understanding of technology during the covid-19 pandemic. The findings show that the facilitating conditions and behaviour intentions of lecturers have a positive influence on their UTAUT model delivery during covid-19 pandemic. For conclusive indication, gender differences have a significant influence on performance expectancy, effort expectancy, and social expectancy of lecturers during covid-19. The study also concludes that education about how to use digital platforms enhances lecturers' delivery of online studies. This result revealed that infrastructural development of ICT should be integrated with our course structure to ensure voluntariness in its use for social benefit.

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AUTHORS' CONTRIBUTIONS

BKA, AA, GAG, SKN developed the study's concept and wrote the introduction section. CWL & FAA drafted the abstract and methodology sections. AA, AA, BKA, FAA & EA drafted the discussion, conclusion and study's strengths and limitations. All authors proofread the manuscript, contributed intellectually to the overall development, and approved the manuscript for submission.

ABBREVIATIONS

EE	-	Effort Expectancy
FC	-	Facilitating Conditions
N	-	Frequency
PE	-	Performance Expectancy
SCT	-	Social Cognitive Theory
SD	-	Standard Deviation
SE	-	Social Expectancy
TAM	-	Technology Acceptance Model
TPM	-	Theory of Planned Behavior
TSET	-	Technology System Evaluation Theory
UTAUT	-	Unified Theory of Acceptance and Use of Technology

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