

## Adoption of E-Learning in Higher Education: Expansion of UTAUT Model

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### Abstract:

*This research is aimed at identifying the determinants that influence higher educational students' behavioral intention to utilize e-learning systems. The study, therefore, proposed an extension of Unified Theory of Acceptance and use of Technology (UTAUT) model by integrating it with four other variables. Data collected from 264 higher educational students using e-learning systems in Ghana through survey questionnaire were used to test the proposed research model. The study indicated that six variables, Performance expectancy (PE), Effort Expectancy (EE), Social Influence (SI), Facilitating Factor (FF), personal innovativeness (PI) and Study Modes (SM) had significant impact on students' behavioral intention on e-learning system. The empirical outcome reflects both theoretical and practical consideration in promoting e-learning systems in higher education in Ghana.*

**Key words:** Behavioral intention, E-learning system, Unified Theory of Acceptance and use of Technology (UTAUT), Higher Educational systems, Ghana.

## 1. INTRODUCTION

Technology in recent times has remained as an important driver for change. Since the last two decades, there have been several significant innovations and developments in the area of Information and Communication Technology (ICT) which has led to changes in the educational sectors as well. The introduction of e-learning has evolved as an important facilitator of the modern teaching and learning process. The term e-learning is not certain, even though it is suggested that the term is most likely originated during the 1980's. Jenkins et al., (2003) defined e-learning as a learning process that is facilitated and supported through the use of Information and Communication Technology (ICT). Curran, (2004) also defined e-learning as a process whereby learners can effectively communicate with their instructors, peers, and access of course or learning materials through the internet or computer. E-learning includes the delivering of contents through network, video recording, interactive TV, CD-ROM, audio, satellite broadcast and so on.

Naturally e-learning is suitable for distance learning, and it's flexible in learning situations making it the primary use for these two types of training. Moreover, it can also be used in combination with face-to-face teaching, which is referred to as blended learning or teaching that is widely used. Due to the significance of e-learning a large number of educational institutions have now incorporated e-learning tools in their full-time, online and distance, programs. A study by Voley et al. (2000) showed that there has been an increasing number of university students in demand for the use of e-learning. Despite e-learning increased usage, and its significance, utilization of e-learning remains a challenge (Moore & Benbasat, 1991; Johansen & Swigart, 1996; Ong et al., 2004). Thus, if learners or teachers fail to use e-learning systems, the advantages of such practices will not be achievable.

(McFarland & Hamilton, 2006). This has called the need to investigate factors that influence adoption and utilization of e-learning by researchers that appear to promise significant benefits (McFarland & Hamilton, 2006; Xu & Yuan, 2009; Venkatesh, Morris, Davis, & Davis, 2003).

This study, therefore, proposes to examine the impact of behavioral intention by using Unified Theory of Acceptance and use of Technology (UTAUT) as a background theory. The independent variables of this research are Performance expectancy (PE), Effort Expectancy (EE), Social Influence (SI), Facilitating Factor (FF), and Students perceived teaching style (SPTS), Academic Specialization (AS) and Study Modes (SM). Intention to adopt (IA) is considered the dependent variable. The results of this empirical study could be significant for designing and testing theories related to e-learning system acceptance as well as decision makers of higher educational institutions in their planning, appraising and executing the use of e-learning systems in the Ghana. This study also contributes to the literature of Unified Theory of Acceptance use Technology (UTAUT)

## **2. THEORETICAL FRAMEWORK**

### **2.1 Comparison of Theories with UTAUT Model**

Out of the Technology adoption theories, UTAUT model is recently found to be a complete model to investigate adoption technology determinants. A study by (Venkatesh et al. 2003) tested UTAUT by using data from four organizations within a duration of six-month and it was indicated that the model outperforms the eight individual models that were used to formulate it. The explanatory power of UTAUT was then confirmed with data from two new organizations with similar results. All the constructs mentioned in the eight models was related to one of the main constructs of UTAUT model concerning the significant similarities that existed among their

definitions and measurement items. Tables 1 presents comparison of theories with UTAUT model and the root constructs of performance expectancy (PE), effort expectancy (EE), social influence (SI), and facilitating factor (FF) respectively.

**Table 1 Comparison of theories with UTAUT Model**

UTAUT	Constructs	Theories
Performance Expectancy	Perceived Usefulness	TAM/TAM2 and C-TAM-TPB
	Extrinsic Motivation	MM
	Job-fit	MPCU
	Relative Advantage	IDT
	Outcome Expectations	SCT
Effort Expectancy	Perceived Ease of Use	TAM/TAM2
	Complexity	MPCU
	Ease of Use	IDT
Social Influence	Subjective Norm	TRA, TAM2, TPB/DTPB and C-TAM-TPB
	Social Factors	MPCU
	Image	IDT
Facilitating Factor	Perceived Behavioral Control	TPB/DTPB and C-TAM-TPB
	Facilitating Conditions	MPCU
	Compatibility	IDT

### 2.1.1 Technology Acceptance Model (TAM)

Davis (1986) initially proposed the TAM model that explains user’s acceptance of information systems from the stance of the external factors’ that influence users’ acceptance of the technology. Davis (1986) further suggested that the TAM model models the situation where users become adopted of a particular newly developed technology.

The TAM model explains external factors as, perceived usefulness (PU), the degree to which a person believes that with the use of a particular system it would improve his or her job. Performance and perceived ease of use (PEOU), the degree to which a person understands that the utilization of a

particular system would be free of effort, will have an influence on attitude towards using technology that is the internal factors. The Attitude towards the use of technology will also have an impact on user's behavioral intention (BI) to or not to use the new technology. Behavior intention (BI), finally determines whether or not users use the system (Davis, 1986).

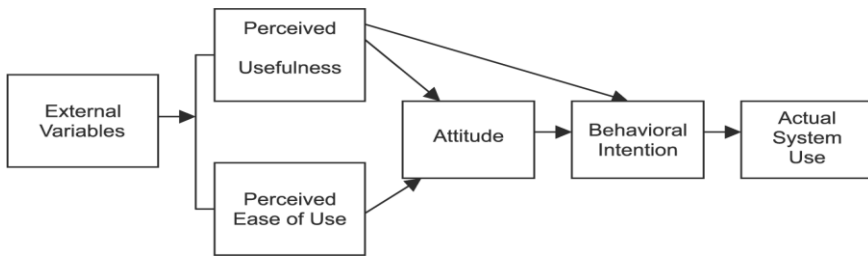


Figure 1 the relationships in the TAM model Davis (1986)

### 2.1.2 Unified Theory of Acceptance and Use Technology (UTAUT)

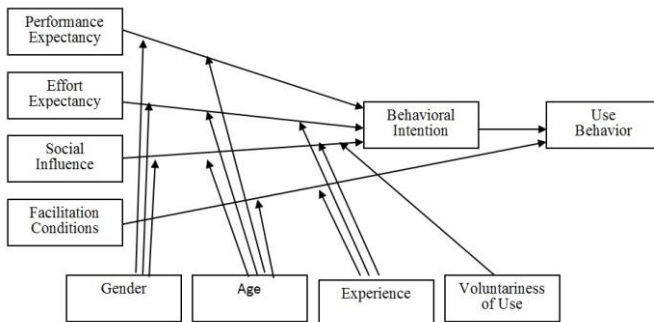
Over the past decades, there have been several modification and changes to the original TAM model that UTAUT model stands out to be the most remarkable one. The Unified Theory of Acceptance and Use of Technology (UTAUT) is an acceptance and adoption model developed by Venkatesh et al. in 2003. The model was designed based on individual's adoption and innovation behavior. According to Yoo, Han, & Huang, (2012), the UTAUT model is perfect in determining the level of employees' motivation regarding adopting new software in a corporate environment and also suitable for analyzing adult learner's adoption behavior of a new e-learning app.

The UTAUT model integrates eight different models (Venkatesh et al. 2003), which includes the theory of reasoned action (TRA), the technology acceptance model (TAM), the motivational model, (MM) the theory of planned behavior (TPB). It also combines the technology acceptance model and theory of planned behavior (C-TAM-TPB), the model of PC

utilization (MPCU), innovation diffusion theory (IDT), and the social cognitive theory (SCT).

The UTAUT model integrated and unified the essential elements of these eight theories into four final constructs that are performance expectancy, effort expectancy, social influence, and facilitating conditions that are direct determinants of behavioral intention. The facilitating condition is the only construct with direct determinant on user behavior. Gender, age, experience, and voluntariness of use are the four mediating factors that were drawn from extrinsic and objective conditions, with impact on the four constructs.

This study used UTAUT over TAM since; studies have shown that the validation of the UTAUT concludes a 70% variance in usage intention, Venkatesh, et al., (2003). Whiles, TAM, and TAM 2 can only show roughly 30% of acceptance, Meister, and Compeau (2002), both TAM and UTAUT models are significant to the study of individual's intention due to the use of quantitative variables. However, unlike TAM, UTAUT addresses Voluntariness of use and facilitating conditions and has the advantage of adding features between mediators and determinant factors.



**Figure 2 UTAUT. Source: [Error! Bookmark not defined.]**

### **3. RESEARCH MODEL AND HYPOTHESIS**

Despite the significance of the UTAUT model in studying individuals' intention to adopt a technology, from the literature review the model lacks enough data on technology adoption from the unique context of e-learning system. The UTAUT model was therefore enriched with four additional constructs that are student's perceived teaching style (SPTS), Academic Specialization (AS) and Study Mode (SM) and Personal Innovativeness (PI) bringing the entire constructs to eight. The study also tested the impact of personal Innovativeness on four the variables on UTAUT model (Performance expectancy, effort expectancy, social Influence, and facilitating factor) Figure 3 presents the model with seven dimensions.

#### **3.1 Explanation of Hypothesis development**

##### **3.1.1 Performance Expectancy**

Performance expectancy can be defined as individual's estimate or believe for potential job benefit for utilizing technology or the degree to which a person believes the use of a particular technology will improve his or her job performance. Performance expectancy derived from perceived usefulness, job-fit, relative advantage and outcome expectation constructs is the strongest predictor of intention to use a system according to Venkatesh, et al., (2003). Therefore, we hypothesize that;

**H1:** *Performance Expectancy has significant positive influence on student's intention to adopt e-learning.*

##### **3.1.2 Effort Expectancy**

Effort expectancy is related to the idea of perceived usefulness of technology explained in the TAM model. Effort expectancy consists of three constructs that include perceived ease of use, complexity, and ease of use, which are derived from previous studies. The construct of perceived ease of use refers to the

degree to which a user considers using a particular technology with it little or no effort; the construct complexity refers the extent to which a person believes that the utilization of a new system would be a comparably more complex tool in its understanding and usage. Also, the construct of ease of use is the extent whereby an individual perceives the use of innovation as being difficult, Venkatesh et al. (2003). Shih, and Wang, (2009) in their study revealed that there is a significant influence on individual's intentions in using information technology. Therefore, we hypothesize that;

**H2:** *Effort Expectancy has a great positive influence on student's intention to adopt e-learning.*

### **3.1.3 Social Influence**

The social influence describes the extent to which a person considers adopting and utilizing a particular technology because of the suggestions of other persons. Social influence is derived from the subjective norm, the social factor, and the image constructs. The subjective norm construct describes the situation in which an individual's decision about whether or not to adopt an innovation are influenced by other people whose ideas are considered to be important to him or her, (Thompson et al., 1991). The social factor construct refers to the situation in which a person's decision to adapt to a new technology are influenced by the entire social situation or society (Bandura, 1991). The image construct explains the degree to which the use of innovation is seen to improve or increase a person's social image or status in the social system. Therefore, we hypothesize that;

**H3:** *Social Influence has significant positive impact on students' intention to adopt e-learning.*

### **3.1.4 Facilitating Factor**

Facilitating Factor refers to the extent to which an individual beliefs that organizational and technical infrastructures are



available to support the use of the system, Venkatesh, et al., (2003). The facilitating condition is a significant measure for effective adoption of e-learning. It is made up of three different constructs that are, perceived behavioral control, facilitating conditions, and compatibility. Efficient use of new technology requires training unless the users have a great hand on in handling with such technology. Facilitating Conditions have a significant positive effect on an individual's use of an information technology, Shih and Wang, (2009). Also, Concannon, et al., (2005), in their study stressed on the importance of providing assistant and technical support for students to facilitate engagement with learning technologies. Thus, we hypothesize that;

**H4:** *Facilitating Factors has a significant positive effect on student's behavioral intention to adopt e-learning.*

### **3.1.5 Students-perceived teaching style**

Over the decades, there have been several academic research and discussions, raised as the results of how teaching styles affect students' learning. Perceived and preferred teaching styles are regarded as the most effective factors for student learning according to Razak, et al., (2007). Perceived teaching style of every student is different which influences student's adoption and usage of e-learning systems, Lin, et al., (2012). Thus, this study uses the student-perceived teaching style instead of the teacher-perceived teaching style. Hence, we hypothesize that;

**H5:** *Students perceived teaching style has a significant influence on student's intention to adopt e-learning.*

### **3.1.6 Academic Specialization**

There are issues with regards to whether some academic specialization has an influence of student's adoption of e-learning. There are some courses that are better taught in conventional classroom settings rather than e-learning such as religion, (Saad, 2005). Also, a subject that is complex such as,

medicine involves practical application and might not be suitable through e-learning, (Lateef, 2010). There have been several studies that have examined the relationship between academic specialization with student's perceptions and usage of e-learning that revealed academic specialization to be a key determinant of adoption decisions, (Yang, 2005; Hsbollah & Idris, 2009). Thus we hypothesize that;

**H6:** *There is a significant relationship between the faculty a student belongs to and the behavioral intention to adopt e-learning.*

### **3.1.7 Study Mode**

Study mode is described as the patterns and intensity of studying (Schuetze & Slowey, 2002). In many countries such as, Canada, United States and the United Kingdom and other European countries, Full-time, part-time and distance learning are the three choices of studying. A full-time student is required to attend class for an average number of hours which involves a full academic load. On the other hand, part-time students normally complete their program of study over a longer period with less academic load. With distance learning, the students are sent with the course syllabus and materials such as textbooks, notes and handouts, videos and audio recordings of the actual lectures. In distance learning, students spend most of their time to study at their homes and offices. Usually, apart from few days introductory or revision sessions, there is no need for attending classes or lectures, except taking examinations on - campus. Within the context of this study, we hypothesize that;

**H7:** *There is a significant relationship between the type of learning and student behavioral intention to adopt e-learning.*

### **3.1.8 Innovativeness Personal**

Personal innovativeness can be defined as the willingness of an individual to learn and adopt any technological innovations

(Lewis, Agarwal, & Sambamurthy, 2003). In the situation of technological innovations, innovativeness of individual can be defined as the personal ability related to positive attitudes towards the adoption of technological innovations and utilization, (Agarwal and Prasad, 1998). Several innovation studies have proven that highly innovative individuals actively take up information about new concepts. Individuals with higher personal innovativeness are likely to build more positive beliefs about the target technology as well as developing more positive perceptions about the innovation with regards to advantage, ease of use, and compatibility (Lu, 2005). Also, a study by Yi, et al., (2006) posited that “some individuals are more willing to take a risk by adopting technological innovations while others are hesitant to change their practice”. Besides, several organizations now focus much on encouraging their employees to enhance their motivation on the adoption of technological innovations as mentioned by, (Talukder, Harris, & Mapunda, 2008). Furthermore, Lee et al., (2006) summarized that the key to successful adoption of technological innovations within organizations is ascertained on the innovativeness level of its employees. As a result, individuals with a high degree of innovativeness within organizations are likely to demonstrate more keenness towards the adoption of technology innovations (Frambach & Schillewaert, 2002). Agarwal and Prasad (1998) introduced new a construct, personal innovativeness, into Davis’s original TAM. They established the use of definite measurement for the innovativeness construct. For that reason, we hypothesize that;

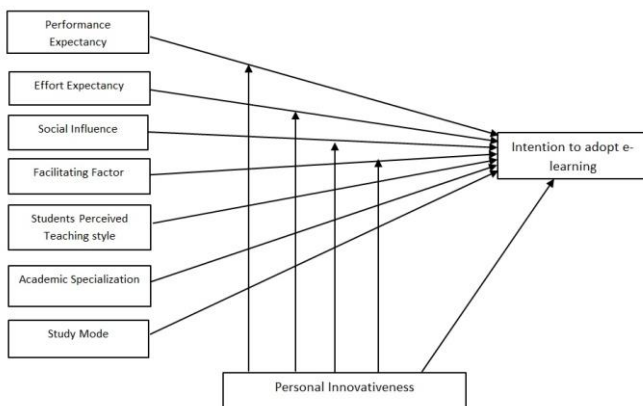
**H8:** *There is a significant impact of individual innovativeness on performance expectancy on students’ behavioral intention to adopt e-learning.*

**H9:** *There is a significant impact of individual innovativeness on effort expectancy on students' behavioral intention to adopt e-learning.*

**H10:** *There is a significant impact of individual innovativeness on social influence on students' behavioral intention to adopt e-learning.*

**H11:** *There is a significant impact of individual innovativeness on facilitating factor on students' behavioral intention to adopt e-learning.*

**H12:** *There is an impact of individual innovativeness on students' behavioral intention to adopt e-learning.*



**Figure 3 Proposed Research Model**

## 4. RESEARCH METHODOLOGY

The proposed hypotheses were tested using by collecting data using survey methods. The questionnaire was randomly distributed among university and polytechnic students using e-learning systems in the Greater Accra region of Ghana. Of the 300 questionnaires distributed 264 were completed and returned constituting 88%. All students were comfortable with

the use of computers as well as the internet. Since the purpose of the study is to examine students intention to adopt e-learning, demographic characteristics were included in the questionnaire.

**Table 2 Demographics of Respondents**

Demographics	Frequency	%
<b>Gender</b>		
Male	146	55.3
Female	118	44.7
<b>Age</b>		
<25	117	44.3
26-35	89	33.7
36-45	43	16.3
>46	15	5.7
<b>Academic Specializations</b>		
Business	121	45.8
Engineering	33	12.5
Education	51	19.3
Science	45	17
Art	14	5.3
<b>Higher Education Level</b>		
First year ( Level 100)	95	36
Second year ( Level 200)	65	24.6
Third year (Level 300)	54	20.5
Fourth year ( Level 400)	50	18.9
<b>Experience with Computers</b>		
<1 year	0	0
1 – 3 years	20	7.6
3 – 6 years	11	4.2
6 – 9 years	31	11.7
>9 years	202	76.5

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## 5. DATA ANALYSIS AND DISCUSSION

Demographics illustrates that male respondents were greater than female respondents with percentage of 55.3. More results were witnessed by the students of age group < 25 with a

percentage of 44.3. Business students dominated the respondents with 45.8 percent, 36 percent of the respondents were first year students dominating the level of higher education students. 76.5 percent of the respondents had experience with the use of computer between >9 years.

**5. 1 Data Analysis techniques:**

Statistical software: SPSS (statistical package for social sciences) was used for the analysis of the data collected for this study. Data analysis techniques used were Descriptive statistics, correlation and regression.

**5.2 Reliability and validity:**

Reliability and validity were conducted to assess the internal consistency (Cronbach’s alpha) and to test the reliability of each of the scales. All the measures included in the questionnaires showed the adequate reliability. The internal reliability of the measures ranged from 0.858 for the measure of Personal Innovativeness (PI) to 0.890 for the measure of Effort Expectancy (EE). Table 3 reports the scales descriptive statistics for the measures used, including minimum, maximum, mean, standard deviation, variance and Cronbach’s alpha for each measure of the study. Overall the reliability of all question items is very good since Cronbach’s Alpha values are above 0.70. This means that the higher the coefficient of reliability the higher internal consistency of the instruments.

**Table 3 Descriptive Statistics**

Constructs	N	Minimum	Maximum	Mean	Std. Deviation	Variance	Cronbach's Alpha
PE	264	4	7	5.17	.871	.759	.867
EE	264	2	7	4.91	1.005	1.009	.890
SI	264	2	7	4.62	1.034	1.068	.876
FF	264	4	7	5.22	.869	.755	.883
SPST	264	2	7	5.07	.959	.919	.871
AS	264	4	7	5.31	.941	.886	.867

SM	264	4	7	5.54	.971	.943	.873
PI	264	4	7	5.21	.941	.885	.858
IA	264	4	7	5.11	.796	.634	.863
Valid N (listwise)	264						

### 5.3 Correlation

A correlation analysis was conducted on all the variables to test the relationship between them by correlating eight independent variables (PE, EE, SI, FF, SPST, AS, SM, and PI) with the dependent variable (IA). The table 4 below indicates all positive figures suggesting that correlations are positive and significant at the 0.01 levels (2- tailed) between, all the independent variables and the dependent variables.

Correlations

Independent Variables		PE	EE	SI	FF	SPST	AS	SM	PI	IA
PE	Pearson Correlation	1								
EE	Pearson Correlation	.376**	1							
SI	Pearson Correlation	.445**	.217**	1						
FF	Pearson Correlation	.364**	.249**	.304**	1					
SPST	Pearson Correlation	.472**	.691**	.379**	.423**	1				
AS	Pearson Correlation	.723**	.292**	.444**	.301**	.476**	1			
SM	Pearson Correlation	.432**	.189**	.524**	.369**	.331**	.646**	1		
PI	Pearson Correlation	.657**	.356**	.611**	.428**	.505**	.626**	.605**	1	
IA	Pearson Correlation	.618**	.260**	.595**	.567**	.473**	.553**	.589**	.760**	1

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

### 5.4 Regression

To accept the hypothesis, the values of significant level of ANOVA and Coefficient Model had to be  $p < 0.05$  for each of the dependent and independent variables in the regression analysis. Apart from students' perceived style of teaching

(SPST) and academic specialization (AS) that were not significant lying at significant level of 0.099 and 0.217 respectively. The remaining independent variables were all significant lying within the given range of  $p < 0.05$  therefore our hypotheses were approved.

**Table 4 Coefficients<sup>a</sup>**

Model	Unstandardized Coefficients		Standardized Coefficients		R Square	F	Sig.
	B	Std. Error	Beta	t			
1 (Constant)	.519	.221		2.35	.700	74.369	.020
PE	.184	.052	.201	3.557			.000
EE	-.091	.038	-.115	-2.376			.018
SI	.108	.035	.140	3.108			.002
FF	.222	.037	.243	5.990			.000
SPST	.076	.046	.091	1.658			.099
AS	-.064	.052	-.075	-1.236			.217
SM	.115	.042	.140	2.710			.007
PI	.335	.048	.395	6.973			.000

a. Dependent Variable: IA

### 5.5 The Influence of Personal Innovativeness on Performance expectancy on Intention to adopt e-Learning

The table 5 shows that the personal innovativeness in strong influence performance expectancy in students adoption to e-learning

**Table 5 Coefficients<sup>a</sup>**

Model	Unstandardized Coefficients		Standardized Coefficients		R Square	F	Sig.
	B	Std. Error	Beta	t			
1 (Constant)	2.004	.228		8.775	.432	198.998	.000
PI	.608	.043	.657	14.107			.000

a. Dependent Variable: PE



Personal Innovativeness has a standardized coefficient  $\beta$  of .657 with a  $t$  value of 8.775 and significance level of 0.000. The result indicates that as the influence of personal innovativeness on performance expectancy increases by one unit, students' behavioral intention to adopt e-learning is influenced positively by .657 units.

### 5.6 The Influence of Personal Innovativeness on Effort Expectancy on Intention to adopt e-Learning

**Table 6 Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients		$t$	$R$ Square	F	Sig.
		B	Std. Error	Beta					
1	(Constant)	2.930	.326			8.978			.000
	PI	.381	.062	.356		6.176	.127	38.141	.000

a. Dependent Variable: EE

The results indicate that effort expectancy in terms of e-learning adoption is significantly influenced by the personal innovativeness. Personal innovativeness has a standardized coefficient  $\beta$  of .356 with  $t$  value of 8.978 and a significance level of 0.000. The result indicates that as the influence of personal innovativeness on effort expectancy increases by one unit, students' behavioral intention to adopt e-learning is influenced positively by .356 units.

### 5.7 The Influence of Personal Innovativeness on Social Influence on Intention to adopt e-Learning

**Table 7 Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients		$t$	$R$ Square	F	Sig.
		B	Std. Error	Beta					
1	(Constant)	1.120	.285			3.934	.373	156.040	.000
	PI	.671	.054	.611		12.492			.000

**Table 7 Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients		R Square	F	Sig.
		B	Std. Error	Beta	t			
1	(Constant)	1.120	.285		3.934	.373	156.040	.000
	PI	.671	.054	.611	12.492			.000

a. Dependent Variable: SI

The results indicate that social influence in terms of e-learning adoption is significantly influenced by the personal innovativeness. Personal innovativeness has a standardized coefficient  $\beta$  of .611 with  $t$  value of 12.492 and a significance level of 0.000. The result indicates that as the influence of personal innovativeness on social influence increases by one unit, students' behavioral intention to adopt e-learning is influenced positively by .611 units.

### 5.8 The Influence of Personal Innovativeness on Facilitating Factor on Intention to adopt e-Learning

**Table 8 Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients		R Square	F	Sig.
		B	Std. Error	Beta	t			
1	(Constant)	3.160	.273		11.572	.184	58.909	.000
	PI	.396	.052	.428	7.675			.000

a. Dependent Variable: FF

The results indicate that facilitating factor with regards to e-learning adoption is significantly influenced by the personal innovativeness. Personal innovativeness has a standardized coefficient  $\beta$  of .428 with  $t$  value of 7.675 and a significance level of 0.000. The result indicates that as the influence of personal innovativeness on facilitating factor increases by one unit, students' behavioral intention to adopt e-learning is influenced

positively by .428 units.

**Table 9 Hypothesis and Remarks**

Relationships/ Paths	Hypotheses	Beta	t	Sig	Remarks
PE--> IA	H1	.201	3.557	.000	Accepted
EE--> IA	H2	-.115	-2.376	.018	Accepted
SI-> IA	H3	.140	3.108	.002	Accepted
FF-> IA	H4	.243	5.990	.000	Accepted
SPST- IA	H5	.098	1.794	.099	Unaccepted
AS-->IA	H6	-.075	-1.236	.217	Unaccepted
SM-->IA	H7	.140	2.710	.007	Accepted
PI-->IA	H8	.395	6.973	.000	Accepted
PI-->PE-->IA	H9	.657	14.107	.000	Accepted
PI-->EE-->IA	H10	.356	6.176	.000	Accepted
PI-->SI-->IA	H11	.611	12.492	.000	Accepted
PI-->FF-->IA	H12	.428	7.675	.000	Accepted

## DISCUSSION

This research sought to determine the factors that influence higher education students' in Ghana intention to use e-learning. The findings indicated that e-learning acceptance is influenced by several factors. The results showed that students' personal innovativeness is the most significant factor in determining students' intention to use e-learning. Students' decision to use e-learning is also influence by facilitating factors, for example the availability of computers and other e-learning tools and support within learning institutions. Moreover, the study also revealed that performance expectancy plays a vital role in shaping students behavioral intention with regards to e-learning acceptance.

Social influence of the e-learning initiative as well as the students' confidence of using the Internet also influences students' intention to use e-learning systems. Furthermore, effort expectancy and study mode were all found to be significant. Academic specialty and students' perceived style of teaching were both not significant and for that reason did not support our hypothesis.

Finally, performance expectancy, effort expectancy, social influence, and facilitating factor were all influenced by personal innovativeness.

## **CONCLUSION**

In summary this study aimed at identifying the determinants that influence higher educational students' behavioral intention to utilize e-learning systems in the Greater Accra region of Ghana. Therefore, the Unified Theory of Acceptance and Use of Technology (UTAUT) were proposed by expanding it with four external factors in the research model in order to investigate students' behavioral intention to adopt e-learning. This study revealed performance expectancy, effort expectancy, social influence, facilitating factor, study mode and personal innovativeness as significant determinants of e-learning adoption among students. Also the study indicated that personal innovativeness has significant impact of performance expectancy, effort expectancy, social influence and facilitating factor in adoption of e-learning by students.

## **Limitation and Future Research Directions**

Despite the significant contributions of this study to literature and providing constructive insights, it also has some limitations. Our sample involved only specific and limited higher educational institutions in a particular geography. The findings may not be fully generalized to other higher educational institutions in other geographical areas. Therefore special caution should be taken when generalizing or extrapolating these findings. Future researches may perhaps use a richer set of variables, including but not only students perceived style of learning, academic specialization, personal innovativeness and study mode. Also various individual factors such as teachers perceived style of teaching as well as other

external factors can be applied as predictors to provide better explanatory power for e-learning behaviors of students.

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