

## **INVESTIGATING ICT ADOPTION BY TEACHERS IN PRIVATE PRIMARY SCHOOLS IN JALINGO, TARABA STATE, NIGERIA**

*EZRA, Siyani Dogo, ANDEMBUBTOB, David Roland & APURU, Jonathan Iliya*

*Lecturer, Taraba State University, Jalingo, Taraba, Nigeria*

### **ABSTRACT**

*The advent of information technology has facilitated teaching and learning for teachers in most part of the world. The aim of this study is to explore the factors influencing the adoption of Information and Communications Technology (ICT) by private primary school teachers in Jalingo, Taraba State, Nigeria. The use of ICT in this context means the use of gadgets such as computers, projectors and smart boards. The study seeks to investigate the acceptance of these technologies in private schools in Jalingo, Taraba State where ICT is deployed. 200 questionnaires were distributed to teachers in such private primary schools. UTAUT model was used to find the factors with the aid of a statistical analysis tool known as smart PLS. Performance expectancy in this study was found to have positive influence on behavioral intention. Effort expectancy was found to have negative influence on teachers' intention to use ICT. Social influence was found to have the strongest impact on teachers' intention to use ICT. Facilitating condition was also found to have positive effect on the use of ICT by teachers in primary schools.*

**KEYWORDS:** *Private Primary Schools, ICT*

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### **INTRODUCTION**

Introduction of Information and Communications Technologies (ICTs) to every aspect of human life has contributed immensely to restructuring, promoting collaboration, and making learning materials accessible to the society. Policy makers and researchers are agreed on the fact that ICT has affected the educational sector in different ways. As the influence of ICT on education increases, schools presently rely on technology to carry out educational activities. The ICT resources can be hardware, software and communications infrastructures (Dong, 2014). Computer systems are used in schools for different purposes some of which are for administrative purposes, for teaching and so on. Most private primary schools in Nigeria are increasingly equipped with computer systems and projectors for teachers to use to carry out their teaching activities.

Although Nigeria places great emphasis on the importance of ICTs in classrooms, there are many factors hindering the adoption of ICTs in the schools. Some of these factors include lack of infrastructure, lack of institutional policies and strategies, cultural issues and lack of technical skills.

The use / application of ICTs are of immense importance due to its benefits today. The inclusion of ICTs in education improves the ease and efficiency with which knowledge and information is transmitted. There is poor level of

adoption especially in Northern Nigeria due to terrorism, illiteracy and poverty. ICT's are adopted as a veritable strategy for development just as in education, health and rural development. ICT's have the capacity to enable communities with a good network and efficient services. The adoption of ICT's in education is also affected by imbalances and inconsistencies.

The popular assumption is that the teachers are capable and confident of using ICT's in class rooms. In order to validate or refute this claim, there is need to examine the factors that hinder or enhance the use of ICT's in private primary schools. ICT's are changing the way organizations are directed, including instruction. (Okebukola, 1997) reasoned that PC's are not a part of classroom innovation in more than 90% of government funded schools in Nigeria. Therefore, the textbook and reading materials keep dominating classroom exercises in most public schools in Nigeria. On the off chance that a nation, for example, Uganda which has not as much as a-fifth of Nigeria's assets, is presently utilizing data and correspondent innovation to assist optional schools under studies with becoming better in data handling (Okebukola,1997).

There are suggestions that ICT was underused because teachers do not accept the use of the technology in carrying out their teaching activities. Most of the studies done address the adoption and implementation of ICT by schools and not explore the teachers' perception of ICT in schools where the ICT was implemented (Palomino, 2017). Despite the advantages that the use of ICT brings, there is no effective use in most schools in Nigeria (Ochuko, 2013).

In a study done in Taraba State, (Austine, 2015) reveals that for successful implementation of ICT, there is need to have ICT infrastructures and their adoption by teachers. Despite the availability of these infrastructures in private primary schools, teachers are reluctant to adopt the use of the ICT. The value of ICT depends on the perception of teachers on ICT and how its support makes their teaching easier. Hence, the need to investigate the factors that affect the adoption and usage of ICT by primary schools teachers in private primary schools because ICT was deployed in most private primary schools.

### **Research Question**

#### **What are the Factors Affecting the Adoption of ICTs by Private Primary School Teachers in Jalingo, Taraba State? Teachers' Perception in ICT Adoption in Primary Schools**

There is no generally acknowledged definition of Information Communication Technology (ICT). This is because technology changes rapidly. In the context of this study, ICT includes the utilization of personal computers, laptops, printers, tablets, LCD projectors and the application of Internet. Information Technology (IT) comprises of the use of this technology to organize, evaluate and research learning materials. Studies show that experience is a vital factor in influencing teachers' willingness to adopt a new technology (Agyei and Voogt 2011). According to (Sang, Valcke, van Braak & Tondeur, 2010), new teachers are not prepared to effectively use new technologies. Lack of time and skill affects the integration of ICT in classrooms. The problems usually faced by academic staff in the process of adopting technology involves the lack of power supply, lack of top management support, lack of skills and lack of interest in learning (Oye, Iahadand Rabin, 2011).

A lot of studies identified that quality and quantity of technology experience are crucial factors in influencing teacher's adoption of technology (Agyei and Voogt, 2011; Drent and Meelissen, 2008). However, there are evidences that technology is under utilized by teachers in classrooms (Dawson, 2008; Kirschner and Selinger, 2003). Studies have shown that there is a gap between the courses taught by teachers and the use of technology in actual classrooms. Other studies show that inexperienced teachers begin to feel reluctant to use a technology when they are not well equipped and effectively trained on how to implement a technology affectively (Sang et al., 2010). There are other factors which were

identified to hinder teachers to adopt a technology in classrooms. Other factors include inadequate access to ICT and dearth of technology skill (Teo, 2009).

Surely, factors such as time, experience and favorable environment also affect the effective application of ICT in classrooms. Recent studies call for a careful incorporation of ICT in classrooms. And there is need for education programs such as training and retraining of teachers on the application of ICT (Koehler and Mishra, 2009). Some of the studies proposed new strategies on developing teacher's abilities on the application of technology because there are challenges with the previous methods (Angeli and Valanides 2009) while this work seeks to use a theoretical model to sort the influential factors that motivate and/ or discourage primary school teachers from adopting ICT in their teaching activities.

Integration of ICT for effective teaching is not a straightforward process; it has to be multilayered. The first approach is to know the teacher's perception of ICT in carrying out their teaching activities. The management has to know the skills teachers need before deploying ICT in school. There are two arguments to consider: the first emphasizes the technological skills; and supporters of this argument suggest that teachers should be well equipped with technological skills before getting into the teaching profession. The second argument emphasizes the importance of developing teachers' perspectives on the technological integration in teaching (Mishra and Koehler, 2006).

### **Related Topics on Adoption of ICT in Private Primary Schools**

ICT has imparted education in so many ways and has enhanced the quality of teaching in schools. The use of ICT in classrooms has assisted teachers and students in teaching and learning respectively. (Ochuku, Amakaino and Chamberlain, 2013) shows that the integration of ICT in education has facilitated learning. It accelerates data access and retrieving and supports development of complex thinking skills. It also prepares students for productive and innovative activities. Despite the abundant advantages of ICT tools, there is low usage of ICT in Primary Schools.

A research was conducted to identify the effective application of ICT in colleges in Delta State and the findings of the study show absence or minor utilization of ICT resources in the colleges (Ochuku et al., 2013). Another study, by (EzeaniandIshaq 2013) shows that the low performance by students in ICT is an outcome of low usage of the ICT resources by teachers in classrooms. (Ochuku et al., 2013) found some factors to be constraints to adoption of ICT which includes poor perception, the lecturers' attitudes towards the application of ICT. They also identified inadequate training and inexperience of staff and students on technologies and e-learning applications. (Osakwe, 2010) found that the lack of access to IT equipment such as internet and computers affect its usage in Nigeria.

(Sang, Valcke, van Braak Tondeur and Zhu, 2011), explored the factors influencing the adoption of ICT in classroom in which 820 Chinese primary school teachers were investigated. The study shows that the utilization of ICT in classrooms enhances learning and teaching processes; and that the use of ICT directly depends on the teachers' motivation and support to enable them use the ICT.

(Vitanova, Atanasova-Pachemska, Iliev, and Pachemska, 2015) investigated the factors affecting the frequent use of ICT in primary school teaching. The research surveyed 214 primary school teachers in the southeast region of Macedonia. The results show that experience and the frequent use of internet at home influence the teachers' attitude towards the adoption of ICT. The study also shows that 33.6 % of the teachers rarely use ICT. In another study done in Plateau State, Nigeria (Oye, et al., 2011) investigated the factors influencing teachers' behavior using the technology acceptance model and unified theory of acceptance. Majority of the respondents who are lecturers said their main problem

is lack of time and training. Some pointed out that they need compensation to use ICT in classrooms and others said it does not fit their programs.

(Wambiriand Ndani,2017) investigated teachers' belief, attitude and computer competence in primary schools in Kenya; and suggested that providing computers to the schools and other ICT infrastructures will not automatically make the teachers use it. The authors recommended that there should be training and preparation syllabus for teachers before integrating ICT in primary schools.

(Salinas et al., 2017) studied the level of adoption of ICT in three Latin countries. An online survey was conducted with about 89 teachers and the study shows that there are differences in the level of adoption in the three countries due to perception of ICT's contribution to teaching and teachers training but in contrast, culture do not contribute to the differences.

(Aslan, A., and Zhu, C. 2018) investigated factors influencing the adoption of ICT by lower secondary school teachers in Turkey. The study showed that perceived competence in ICT integration and pedagogical knowledge are significant predictors for starting teachers' integration of ICT into their teaching practices. Teachers should have opportunities and access to ICT resources to integrate ICT into their teachings effectively. Besides, changes are necessary in curriculum and assessment systems to enable teachers facilitate teaching with ICT.

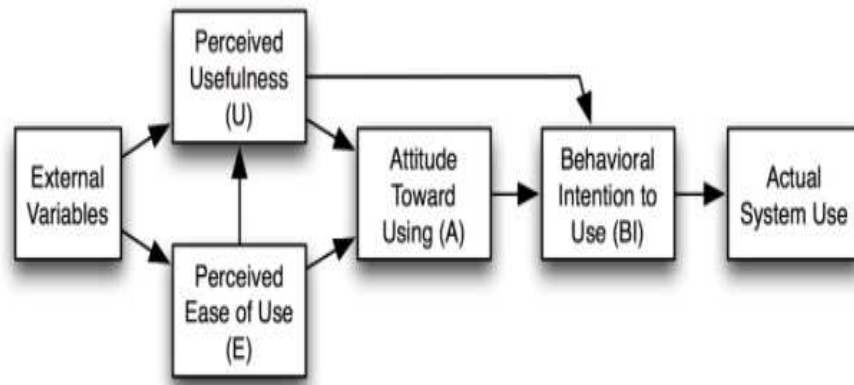
The studies above investigated teacher's perception on ICT in classrooms. This study uses UTAUT to investigate the adoption of ICT in private primary schools in Jalingo Taraba state.

## **REVIEW TECHNOLOGY ACCEPTANCE MODELS**

Information systems research offer different acceptance models that are competing against each other. Most of the technology acceptance models have their advantages and limitations. In order to investigate the factors affecting the use of ICT in primary schools, there is need to look into different technology acceptance models and pick the appropriate one that will best answer the research question.

This study will adopt the Unified Theory of Acceptance and Use of Technology "(UTAUT)" by (Venkatesh, Morris, Davis, and Davis, 2003) "to investigate the factors affecting the adoption of ICT in private primary schools in Jalingo, Taraba State, Nigeria. This model was adopted because it was made up of the best qualities of eight technology acceptance models. Technology Acceptance Model (TAM)

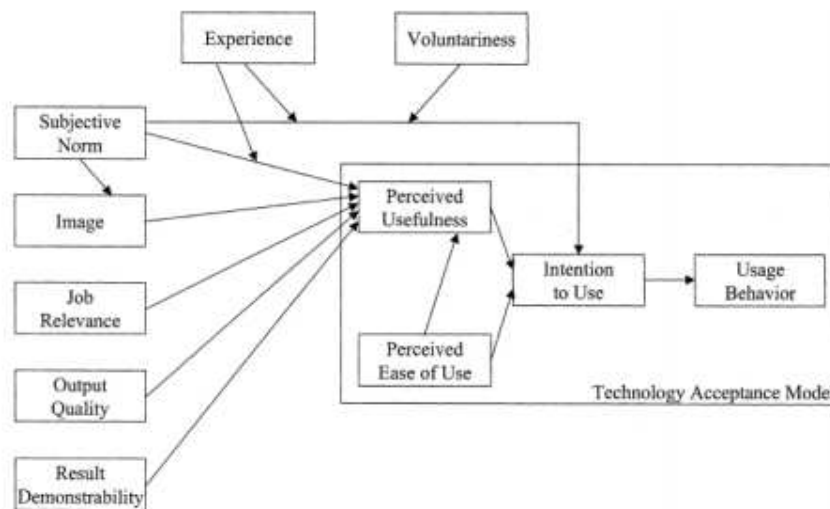
The model was developed by (Davis, 1989) and explains some of the decisive factors that will make an individual to adopt information technology. The model as shown in Figure 2.4 below, explains the usage behavior. The theory has two autonomous constructs which include perceived usefulness (PU) and also it includes perceived ease of use (PEOU). These two constructs will have positive or negative effect(s) on the individual behavioral intention to adopt an information technology. One of the merits of TAM is that it gives room for additional constructs.



**Figure 1: Technology Acceptance Model (TAM) by (Davis 1989).**

**COMBINATION OF TECHNOLOGY ACCEPTANCE MODEL (TAM 1 & TAM 2)**

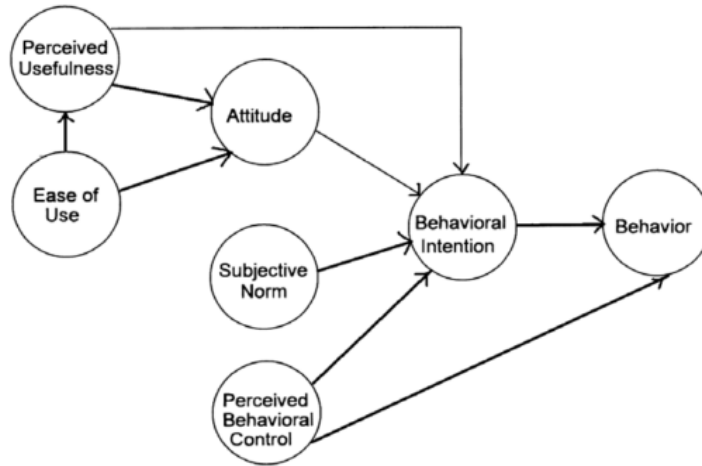
The combination of the model theory was developed by (Devis, 1975). It considers elements such as perceived ease of use and perceived usefulness. This theory incorporates the construct of TAM plus additional constructs (Subjective norm, image and voluntariness). The constructs involve perceived ease of use and perceived usefulness which are very important in technology acceptance. Voluntaries considered that whether the technology is voluntary or mandatory, as expressed in Figure 2:



**Figure 2: Tam 2 by Venketesh and (Devis, 2000).**

**Technology Acceptance Model and Theory of Planned Behavior (Tam & Tpb)**

The combination of theory of planned behavior and technology acceptance models was integrated by (Taylor and Todd, 1995). They integrated constructs such as experienced users which were found to have positive effect on actual usage behavior that those without experience as shown in Figure 3 below. The theory also shows that there is difference in the impact of perceived ease of use and perceived usefulness on experienced and non-experienced users’ behavioral intention to use a technology. As shown in Figure 2.6 below, subjective norm and attitude has influence on usage behavior.

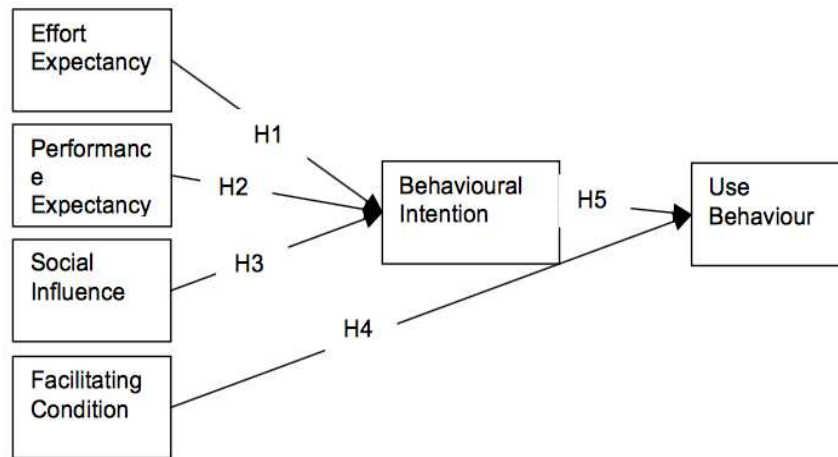


**Figure 3: Decomposed Theory of Planned Behavior (DTPB) by (Taylor and Todd, 1995).**

**METHODOLOGY AND HYPOTHESIS DEVELOPMENT**

**Research Model**

This research focuses on UTAUT and aimed to study the social influence, performance expectancy, effort expectance and facilitating condition, as detailed in Figure 4 below. This study used only the main constructs without the moderators. Some researchers used the moderators while others did not use it. For example, (Al-Gahtani et al., 2007) and (Armida, 2008) used only the main constructs and omitted the moderators. The teachers’ demographics such as age, gender, experience will also be considered.



**Figure 4: UTAUT by (Venketesh et al., 2003).**

**HYPOTHESIS DEVELOPMENT**

**Effort Expectancy (EE)**

This refers to the extent to which a user perceives the system to be easy to use. It is referred to as the perceived ease of use in (TAM) as expressed in Figure 3.1 above. It is considered that when users perceive that the technology is effort free, they developed the intention to use it (Venkatesh et al., 2003). Therefore, it is hypothesized that:

**H1:** Effort expectancy will have positive effect on the behavioral intention of private primary school teachers to use ICT.

### Performance Expectancy (PE)

(Venkatesh et al., 2003) defined Performance Expectancy (PE) as the degree to which a user believes that, system will be useful in carrying out his or her activities. The performance expectancy is the most significant predictor in most studies. It predicts the usefulness of the technology (detailed in Figure 3.1 above). It is certain that when the teachers perceived the ICT in the school to be useful, they will develop behavioral intention in its favor. In this study, performance expectancy has direct relationship to behavioral intention. Therefore, it is hypothesized that:

**H2:** Performance expectancy will have positive effect on the behavioral intention of private primary school teachers to use ICT.

### Social Influence (SI)

This is the influence of others in ones intention to adopt information technology. The influence of others on individuals has positive or negative effects on his behavior. It is similar to subjective norm in TPB as expressed in Figure 3.1 above and shows that when people around an individual use a particular technology, there is tendency of the individual to develop interest to use the technology. In this study, it is believed that when a teacher's friends, family and colleagues use the ICT, he / she will develop interest to use it:

**H3:** Social Influence will have positive influence on the behavioral intention of private primary school teachers to use ICT.

### Facilitating Condition (FC)

Facilitating condition refers to the degree to which an individual believed that, the availability of infrastructures will make him use a technology. Facilitating conditions are the factors that will make the utilization of technology easier in schools. When teachers believe that the environment is conducive, for example there is power and air conditioned environment, it will make the teachers intention to use the technology in place (also see Figure 3.1 above). Therefore, it is hypothesized that:

**H4:** Facilitating conditions will have a positive influence on the behavioral intention of private primary school teachers to use ICT.

**H5:** Behavioral intention will have a direct influence on the behavioral intention of Private primary school teachers to use ICT.

## DATA COLLECTION TECHNIQUES AND PROCEDURES

Quantitative data was collected after distributing questionnaires to teachers of private primary schools in Jalingo. The schools investigated include New Edition Nursery/ Primary School, Ruby Classy Nursery/Primary School, 3PS Nursery/Primary School Academy, Kingdom Heritage Nursery/Primary School, Grace Junior Nursery/Primary School, and Jehovah Jireh Nursery/Primary School.

### Sample Size

According to (Hair, Ringle, and Sarstedt, 2011), the minimum sample size of 100 is appropriate when considering models with maximum of five constructs, 150 for models with six or more constructs and 500 for models with multiple constructs. This gives a good idea of the appropriate sample size for this study. It is important to determine the sample size that will be used to represent the larger population. Sample size formula below was used to determine the appropriate number of respondents:

Where:

$(Z_{\alpha/2})=Z$  value (2.58=99%; 1.96=95% confidence level)

In this case 1.96 was used

P=percentage proportion of choice (10% used for sample size needed)

E=margin of error (5%) going as per the stated assumptions the sample size will therefore

$$\text{Sample size}=\frac{(Z_{\alpha/2})^2 \times P(1-P)}{E^2} \dots\dots\dots(1)$$

$$=\frac{(1.96)^2 \times 0.1(1-0.1)}{0.05^2} \dots\dots\dots(2)$$

$$=\frac{3.8416 \times 0.09}{0.0025} \dots\dots\dots(3)$$

Answer =139

**Figure 5**

**Partial Least Square (PLS)**

Partial Least Squares (PLS) popularly known as smart PLS is structural equation modeling techniques. PLS has recently gained interest and use among researchers due to its capacity to show latent constructs of non-normality and medium sample sizes. It helps researchers to find similarities among constructs of interest. Smart PLS shows how well the measures associated with each constructs (Hair et al., 2012). Smart PLS also shows how a hypothesis can be confirmed and also be rejected. It provides a precise assumption of path which is typically biased by errors in other techniques such as multiple regressions.

**Validity and Reliability of Research Instrument**

The validity and reliability was measured after running the data into smart PLS which is the statistical instrument used in this study. A given data is said to be valid if it measures what it is supposed to measure. The reliability is measured using composite reliability or Cronbach’s Alpha (Hair et al., 2006). Most studies in structural equation modeling uses composite reliability to measure the internal consistency of the instruments.

**DATA PRESENTATION AND INTERPRETATION OF RESULTS**

**Research Data Presentation and Analysis of the Result**

**Demographic**

The gender distribution of the sample population is represented in Table 1 and Figure 5 shows that 108 of 200 respondents which represent 54 % are male teachers while 92 which represent 46 % are females.

The age distribution of the sample population is expressed in Table 2 and is also expressed in the pie chart, as shown in Figure 6 below. This shows the age bracket of the teachers in private primary schools in Taraba State. 49 % of the teachers are between 18 and 24 and only 3 % are above 45.

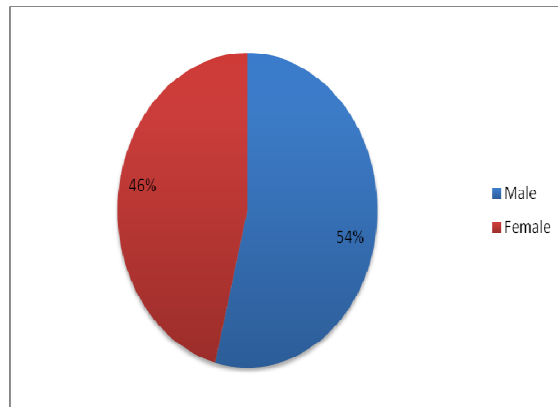
The educational level distribution of the sample population is expressed in Table 3 below and shows that, 67 % of the teachers have NCE and Diploma, 29 % have SSCE certificates while, only 10 % have bachelor’s degree. This is also expressed in the pie chart in Figure 8 below.



The experience level of the sample population is shown in Table 4 below. This shows that, the years of experience of most of the teachers (34 %) are in the range 1–3 years while the next 27 % are in the range 4–6. This is also shown in the pie chart in the Figure 9 below.

**Table 1: Demographic of the sample population**

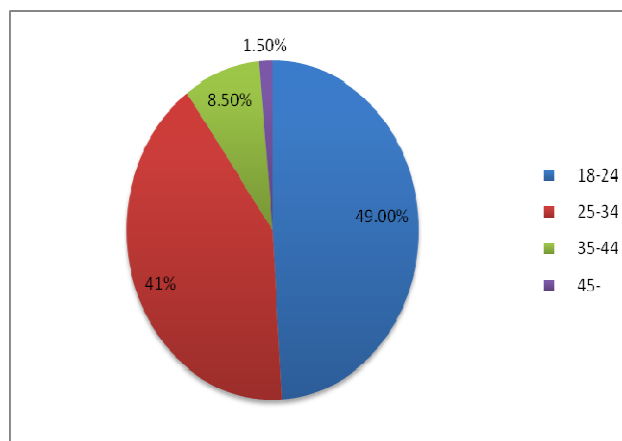
Gender Distribution		
Male	108	54 %
Female	92	46 %
<b>Total</b>	<b>200</b>	<b>100 %</b>



**Figure 6: Gender Distribution.**

**Table 2: Age Distribution**

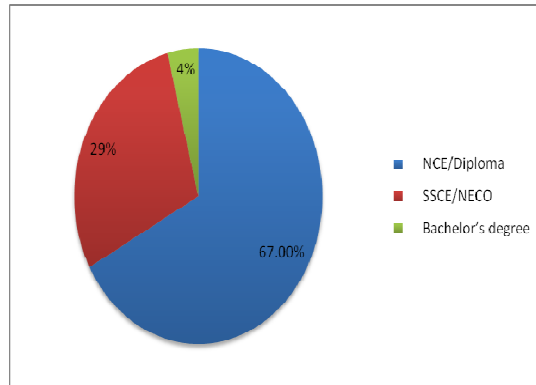
Age Distribution		
18–24	98	49.0%
25–34	82	41 %
35–44	17	8.5 %
45	3	1.5 %
<b>Total</b>	<b>200</b>	<b>100 %</b>



**Figure 7: Age Distribution.**

**Table 3: Educational Level**

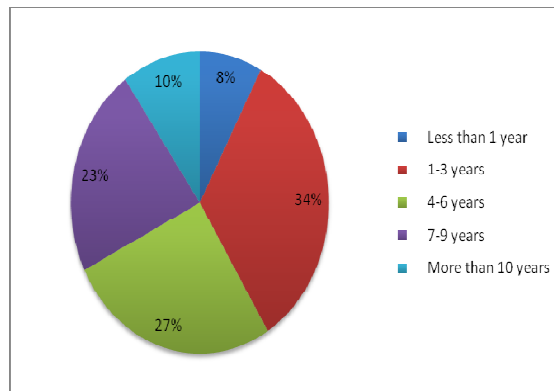
Educational Level		
NCE / Diploma	133	67.0%
SSCE / NECO	57	29 %
Bachelor's degree	10	4 %
<b>Total</b>	<b>200</b>	<b>100 %</b>



**Figure 8: Educational Level Distribution.**

**Table 4: Experience**

Experience		
Less than 1 year	15	8 %
1–3 years	67	34 %
4–6 years	53	27 %
7–9 years	45	23 %
More than 10 years	20	10 %
<b>Total</b>	<b>200</b>	<b>100 %</b>



**Figure 9: Experience Distribution.**

**CONSTRUCT RELIABILITY AND VALIDITY**

Construct Reliability and Validity can be known when PLS- SEM is used for analysis. Composite reliability is the most appropriate method for measuring internal consistency. Composite reliability does not assume that all loadings are equal and does not overestimate as in the case of Cronbach’s alpha. Therefore, composite reliability is recommended and the composite reliability values will be used to determine the construct reliability of the study. In order to achieve an acceptable value of composite reliability, items with low loadings are dropped. The recommended value of composite reliability is 0.7 which shows the values are highly reliable (Hair et al., 2012).

**THE MEASUREMENT OF CONSTRUCT VALIDITY**

The construct validity measures the accuracy of the measurements. It ensures that the measurement items of a given construct, provides accurate or reasonable value of operationalization of the given construct. In this study, convergent and discriminant validity will be considered. Convergent and discriminant validity are mostly considered when using PLS- SEM (Hair et al., 2012).

### Convergent Validity

Convergent validity accesses the level of the correlation of many indicators of the same constructs. The convergent validity is determined using the average variance extracted. Average Variance Extracted (AVE) measures the variances that are shared between a particular construct and the other constructs (Hair et al., 2013). Convergent validity measures the factor loadings of the measurement indicators. The instrument used for the measurement in this study shows high level of convergent validity with values above the threshold of 0.5. As shown in the Table 5 below, the AVE is above 0.5 for each construct.

**Table 5: Composite Reliability and Average Variance Extracted**

Latent Constructs	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Behavioral Intention	0.521	0.781	0.650
Effort Expectancy	0.873	0.905	0.705
Facilitating Condition	0.826	0.884	0.660
Performance Expectancy	0.483	0.741	0.610
Social Influence	0.394	0.710	0.580
Use of ICT	0.841	0.904	0.760

### Discriminate Validity

Discriminate validity measures the extent to which a particular construct differs from another. A reliable and valid measurement should be able to have high discriminate validity. It is when a construct exhibit high variance with its measurement than with other constructs in the research model. The Fornell–Lacker criterion shows the variances in the average variance extracted. The square root of the average variance extracted of a particular construct is higher than that of other latent constructs. The diagonal values of the Fornell-Lacker scale table show the square root of the AVE (Ringle, 2014). The value shows the accuracy of the results because the diagonal values are greater than the off-diagonal values and the corresponding columns and rows, as shown in Table 6 below.

Another way to access the discriminate validity is the loadings. This is done by comparing an item's loading with its associate latent constructs. A discriminate validity is established when the indicator loading is higher than the threshold value loadings of all other constructs. This is confirmed to be higher as illustrated in the Table 6 above. The table shows the value of CR and the value of AVE. The value of CR ranges from 0.710 to 0.895 which are all within the acceptable range.

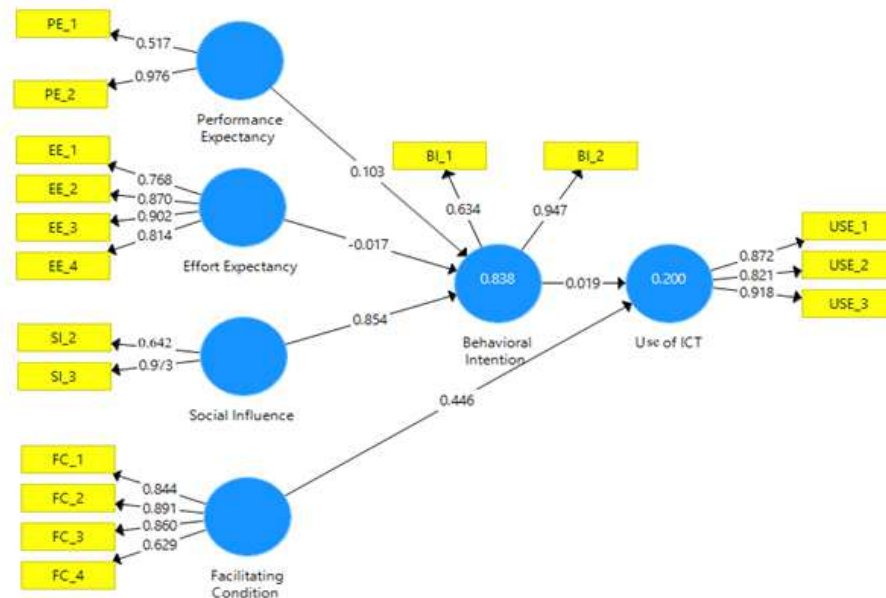
The structural model as expressed in Figure 10 above shows performance expectancy (PE) with two items or questions PE\_1 and PE\_2. PE\_3 and PE\_4 were dropped because they have low loadings. Effort expectancy (EE) has four questions and question none was dropped because all has acceptable loadings above 0.5. Social influence (SI) has two questions SI\_3 and SI\_2 the other questions were dropped, same with Facilitating conditions four questions and non was dropped because of lower loading. The questions with low loadings are dropped so as to get a stable validity and reliability. The above Figure 4, 5 also shows the validity and reliability path coefficient after running in the SMART PLS algorithm. It also shows the construct variable of independent variable, the intermediary and the dependent variable of the R2 the path coefficient from Performance Expectancy to Behavioral Intentions shows the p value of the path effect which is 0.103 as illustrated in Figure 4, 5 above, also the Effort Expectancy to Behavioral Intention shows the path effect which is -0.017 as also shown in Figure 10 above, furthermore, Social Influence to behavioral Intention shows the strongest value of the path coefficient of 0.854 as shown in Figure 10 above and the Facilitating Condition of each of the variables to dependent variable Behavioral Intention and Use of ICT also has a positive value of the path coefficient of 0.446, as described in Figure 10 below.

The latent constructs are the factors identified affecting the adoption of ICT and the H1 to H5 are the hypothesis showing the relationship between the factors in Table 8 below. Path coefficient is the path relationship from the structural model. T statistics are the values showing the significance of the relationships between the dependent and independent variables. A hypothesis is significant if the T statistic value is above 1.65 which represents 90 % confidence level. The P value also shows the significance of the T value that is if p values is  $p < 0.1$ ,  $p < 0.05$  or  $p < 0.01$  it is regarded as significant.

The results as illustrated in Table 7 above, shows that Effort Expectancy to Behavioral Intention to use ICT in private primary schools is ( $\beta = -0.017$ , not significant). Performance Expectancy to Behavioral Intention ( $\beta = 0.103$ ,  $p < 0.1$ ), Social Influence to Behavioral Intention ( $\beta = 0.854$ ,  $p < 0.01$ ), Facilitating Condition to use of ICT ( $\beta = 0.446$ ,  $p < 0.01$ ). Behavioral Intention to use of ICT is ( $\beta = 0.019$ ,  $p < 0.1$ ). The p values show the level of the result significance and the beta ( $\beta$ ) value is the path coefficient in the structural model of Figure 10 below.

**Table 6: Fornell–Larcker Criterion**

Latent Constructs	CR	AVE	A	B	C	D	E	F
Behavioral Intention (A)	0.781	0.650	0.806					
Effort Expectancy (B)	0.905	0.705	0.088	0.840				
Facilitating Condition (C)	0.884	0.660	0.045	0.620	0.813			
Performance Expectancy (D)	0.741	0.610	0.593	0.112	0.078	0.781		
Social Influence (E)	0.710	0.580	0.911	0.109	0.075	0.575	0.762	
Use of ICT (F)	0.904	0.760	0.039	0.453	0.446	0.068	0.028	0.872



**Figure 10: Structural Model.**

**Table 7: Path coefficient, T-Values, P-Values**

Latent Constructs	Path coefficient T Statistics	T Statistics	P Values	Remarks
H1: Performance Expectancy > Behavioral Intention	0.103	2.168	0.030	Supported
H2: Effort Expectancy > Behavioral Intention	-0.017	0.415	0.678	Not Supported
H3: Social Influence > Behavioral Intention	0.854	18.992	0.000	Supported
H4: Facilitating Condition > Uses of ICT	0.446	5.515	0.000	Supported
H5: Behavioral Intention > Uses of ICT	0.019	0.301	0.021	Supported

## HYPOTHESIS TESTING

**H1:** performance expectancy will have positive effect on the behavioral intention of private primary school teachers to use ICT.

According to the UTAUT model in this study, Performance Expectancy was predicted to have a positive relationship on the Behavioral Intention for the private primary school teachers to use ICT. From the path coefficient Table as shown in Table 7 above, there is a positive relationship between Performance Expectancy and Behavioral Intention ( $\beta = 0.103$ ,  $p < 0.1$ ), as shown in Table 7 and Figure 10 above. Performance expectancy on behavioral intention implies that, when teachers are convinced that the use of ICT will improve their performance, they will have behavioral intention to use the ICT. This result is in agreement with other studies that performance expectancy has positive influence on behavioral intention (Oye, et al., 2011). Therefore, H1 is supported. This means the primary school teachers expect ICT to increase their performance in teaching.

**H2:** Effort expectancy will have positive effect on the behavioral intention of private primary school teachers to use ICT.

Effort expectancy is predicted to have positive influence on the behavioral intention to use ICT by private primary school teachers. The result from this study shows that, there is negative relationship between the effort expectancy and behavioral intention which contradicted the proposed hypothesis with this value ( $\beta = -0.017$ ,  $p < 0.01$ ), as shown in Table 7 and Figure 10 above. The relationship between effort expectancy and behavioral intention of the teachers to use ICT in the private primary school implies that, the private primary school teachers believed that the ICT deployed is not easy to use and assumes that it is difficult to use or operate the ICT. Therefore, this means that when the ICT is easy, it may not have effect on their intention to use it.

**H3:** Social Influence will have positive influence on the behavioral intention of private primary school teachers to use ICT.

The result from this study shows that, there is positive relationship between social influence and the behavioral intention of the teachers to use the ICT with this values ( $\beta = 0.854$ ,  $p < 0.01$ ), as shown in Table 7 and Figure 10. Which is in consistent with other studies showing that if people around use ICT, the user will develop a behavioral intention to use it too (Al-fahim, 2013; Juinn & Tan, 2013).

**H4:** Facilitating condition will have positive influence on the behavioral intention of private primary school teachers to use ICT.

In hypothesis four, it was predicted that there would be positive influence on the behavioral intention to use ICT by private primary school teachers. Results from this study also shows that there is positive relationship between the facilitating condition and behavioral intention of the teachers to use the ICT with this value ( $\beta = 0.446$ ,  $p < 0.01$ ), as shown in Table 7 and Figure 10 above. The result is consistent with other studies showing that if the environment is conducive, users will have positive intention to use the ICT (Ifenthaler and Schweinbenz, 2013; Oye, et al., 2011).

**H5:** Behavioral intention will have direct influence on the behavioral intention to use ICT by Private primary school teachers.

The fifth hypothesis is that behavioral intention will have positive influence on the use of ICT. The result from this study showing that behavioral intention has positive influence on the use of ICT ( $\beta = 0.019$ ,  $p < 0.1$ ), as shown in Table 7 and Figure 10 and this shows that if the teachers develop behavioral intention they definitely use the deployed technology.

## **HYPOTHESIS RELATIONSHIPS**

### **Relationship between Performance Expectancy and Behavioral Intention**

The performance expectancy has a positive relationship with behavioral intention. From the structural model, the path coefficient is positive (0.103) as shown in Table 7 and Figure 10. This implies that teachers give high regard or preference to the level the ICT will be useful to them. The ability of the ICT to help the teachers to achieve their task easily will give them motivation to use the ICT. The statistic significant also shows that PE-BI is statistically significant with p value greater than 0.1. This is in consistent with previous studies that performance expectancy has positive relationship with behavioral intention (Al-Shafi and Weerakkody, 2010; Hanafizadeh, Keating and Khedmatgozar, 2014; Oye, et al., 2011).

### **Relationship between Effort Expectancy and Behavioral Intention**

The path coefficient value from the path model shows that there is negative relationship between effort expectancy and behavioral intention (-0.017), as shown in Table 7 and Figure 10. The teachers in this study show that, there is insignificant relationship between ease of ICT and behavioral intention to use the ICT. Furthermore, the result also shows the significant level of the relationship. The significant level is measured using p value which is greater than the 0.5. The result is in consistent with other studies where effort expectancy was found to be negative (Raman, Utara, Khalid, Utara, and Hussin, 2014).

### **Relationship between Social Influence and Behavioral Intention**

The path coefficient between social influence and behavioral intention from the structural model is positive (0.854) as shown in Table 7 and Figure 10. The path coefficient is high which shows that it has strong effect on behavioral intention than other construct. The result means that the teacher will be more influenced to use the technology if the people around them, such as colleagues, friends and family use the technology and also if the top management, celebrities and public figures uses a technology can motivate users to adopt the technology. The p value also shows that the relationship is highly significant.

### **Relationship between Facilitating condition and Use of ICT**

The relationship between facilitating condition and use of ICT is found to be positive and significant as shown in Table 7 and Figure 10. The respondents in this study shows that, if the environment is conducive. There are personnel to help if any technology develop fault. Technical infrastructures influence the use of ICT by the teachers in private primary schools.

### **Relationship between Behavioral Intention and Use of ICT**

The last hypothesis is that behavioral intention will have positive relationship on the use of ICT. The result from this study shows there is positive relation with path coefficient value of (0.019) as shown in Table 7 and Figure 10. This implies that the teachers will have behavioral intention to use ICT.

## **CONCLUSIONS**

The focal point and objective of this research was to establish the factors affecting the adoption of ICT by teachers in private primary school in Jalingo, Taraba State. Data was collected, analyzed and presented.

A Partial Least Square (PLS) method which has recently gained interest and use among researchers was adopted for analysis, due to the ease within which it helps us to understand relationships among the constructs. Smart partial least square precisely shows how the measures relate to each construct from a total respondent. The PLS, popularly known among researchers as smart PLS was used to test the theory as well as the hypothetical variables. The research finding based on the prediction of the hypothesis leaves no reader or user in doubt that the use of ICT in private schools was the needed paradigm shift to effective knowledge impartation to the pupils.

The study investigated the factors affecting the adoption of ICT by private primary school teachers in Jalingo, Taraba State and the result of the study shows that performance expectancy has positive influence on behavioral intention to use ICT. The teachers also believe that if the top management uses the ICT, it will motivate them to use it. Facilitating condition, Behavioral Intention has positive relationship to the use of ICTs. The study on the factors affecting user acceptance of a technology was stimulated by the advancement of information technology in the educational sector. ICT was considered to be a fundamental force in the educational sector. Information Technology has transformed how teaching is designed and delivered. In this study, the Social Influence, Performance Expectancy, and Facilitating Conditions were observed to have significant impact on Behavioral Intention to use ICT in private primary schools in Jalingo. The study further shows that Social Influence has stronger effect on behavioral intention.

This study will contribute to the academia by confirming the predictive power of Unified Theory of Acceptance (UTAUT). It also shows the statistical power of the Structural Equation model (SEM) tool and Partial Least Square (PLS).

The significance of adopting ICT in private primary schools from the research findings of this project makes it no more optional for proprietors / proprietress, but a compelling teaching device that must begin to attract required financial budgets to be fully adopted for needed ease, efficiency and proficiency in today's modern private primary schools.

It is therefore important for the management to develop a way of increasing the performance expectancy, social influence and facilitating condition through workshops and seminars to educate the teachers on the benefit of ICT to them and provide enabling environment for the teachers to use ICT. However, further study can focus on Factors Affecting adoption of ICT in both Public and Private Primary Schools, and if necessary, extend the research to Tertiary Institutions. Results from these can be of wider use and general acceptability to both fellow researchers and management of such institutions because of the dynamism of all ICT related topics.

## REFERENCES

1. Agyei, D. D., & Voogt, J. M. (2011). *Exploring the potential of the will, skill, and tool model in Ghana: Predicting prospective and practicing teachers' use of technology*. *Computers & Education*, 56(1), 91–100.
2. Al-fahim, B. N. H. (2013). *An Exploratory Study of Factors Affecting the Among Postgraduate Students*, 13(8).
3. Al-Gahtani, S. S., Hubona, G. S., & Wang, J. (2007). *Information technology (IT) in Saudi Arabia: Culture and the acceptance and use of IT*. *Information & Management*, 44(8), 681–691.
4. Alkhatabi, M. (2017). *Augmented Reality as E-learning Tool in Primary Schools' Education: Barriers to Teachers' Adoption*. *International Journal of Emerging Technologies in Learning (IJET)*, 12(02), 91–100.
5. Bandura, A. (1977). *Self-efficacy: toward a unifying theory of behavioral change*. *Psychological review*, 84(2), 191.

6. Al-Shafi, S., & Weerakkody, V. (2010). *Factors affecting e-government adoption in the state of Qatar. Proceedings of the European and Mediterranean Conference on Information Systems Abu Dhabi UAE 1213 April 2010, 2010, 1–23. <https://doi.org/10.1179/204264411X12961227987886>.*
7. Amuche, A. A. (2015). *Availability and Utilization of ICT Resources in Teaching and Learning in Secondary Schools in Ardo-Kola and Jalingo, Taraba State, Journal of Poverty, Investment and Development www.iiste.org ISSN 2422-846X Vol.8, 2015 94–101.*
8. Angeli, C., Valanides, N., & Kirschner, P. (2009). *Field dependence–independence and instructional-design effects on learners’ performance with a computer-modeling tool. Computers in Human Behavior, 25(6), 1355-1366.*
9. Armida, E. (2008). *Adoption process for VOIP: The influence of trust in the UTAUT model. (Ph.D thesis, Purdue University).*
10. Aslan, A., & Zhu, C. (2018). *Starting teachers’ integration of ICT into their teaching practices in the lower secondary schools in Turkey. Educational Sciences: Theory & Practice, 18(1).*
11. Chigona, A., Chigona, W., Kayongo, P., & Kausa, M. (2010). *An empirical survey on domestication of ICT in schools in disadvantaged communities in South Africa. International Journal of Education and Development using Information and Communication Technology, 6(2), 1C.*
12. Davis, F. D. (1989). *Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technol MIS Quarterly, 13(3), 319–340. <https://doi.org/10.2307/249008>.*
13. Dawson, V. (2008). *Use of information communication technology by early career science teachers in Western Australia. International Journal of Science Education, 30(2), 203–219.*
14. Dong, C. (2014). *Young Children’s Use of ICT: Preschool Teachers’ Perceptions and Pedagogical Practices in Shanghai the University of Newcastle, (May).*
15. Drent, M., & Meelissen, M. (2008). *Which factors obstruct or stimulate teacher educators to use ICT innovatively? Computers & Education, 51(1), 187–199.*
16. Ezeani, N. S., & Ishaq, A. M. (2013) *Emerging issues in business education: A panacea for effective utilization and application of ICTs as a tool in business education in Nigerian universities. Review of Public Administration and Management, 1 (2), 89–107.*
17. Hair, J., Black, W. C., Babin. B. J., Anderson, R. E., Tatham, R. L., (2006). *Multivariate data analysis (6th ed.) New Jersey: Prentice-Hall Inc.*
18. Hair, J. F., Ringle, C. M., & Sarstedt, M. (2011). *PLS-SEM: Indeed a silver bullet. Journal of Marketing theory and Practice, 19(2), 139-152.*
19. Hair, J. F., Ringle, C. M., & Sarstedt, M. (2012). *Partial Least Squares: The Better Approach to Structural Equation Modeling? Long Range Planning, 45(5–6), 312–319. <https://doi.org/10.1016/j.lrp.2012.09.011>.*
20. Okebukola, P. (1997). *Old, new, and current technology in education. UNESCO Africa 14 (15): 7–18.*



21. Hair, J. F., Ringle, C. M., & Sarstedt, M. (2013). *Partial Least Squares Structural Equation Modeling: Rigorous Applications, Better Results and Higher Acceptance*. *Long Range Planning*, 46(1–2), 1–12. <https://doi.org/10.1016/j.lrp.2013.01.001>.
22. Hanafizadeh, P., Keating, B. W., & Khedmatgozar, H. R. (2014). A systematic review of Internet banking adoption. *Telematics and Informatics*, 31(3), 492–510. <https://doi.org/10.1016/j.tele.2013.04.003>
23. Ifenthaler, D., & Schweinbenz, V. (2013). *Computers in Human Behavior The acceptance of Tablet-PCs in classroom instruction: The teachers' perspectives*. *Computers in Human Behavior*, 29(3), 525–534. <https://doi.org/10.1016/j.chb.2012.11.004>.
24. Juinn, P., & Tan, B. (2013). *Applying the UTAUT to Understand Factors Affecting the Use of English E-Learning Websites in Taiwan*. <https://doi.org/10.1177/2158244013503837>.
25. Kirschner, P., & Selinger, M. (2003). *The state of affairs of teacher education with respect to information and communications technology*. *Technology, Pedagogy and Education*, 12(1), 5–17.
26. Koehler, M., & Mishra, P. (2009). *What is technological pedagogical content knowledge (TPACK)? Contemporary issues in technology and teacher education*, 9(1), 60–70.
27. Mishra, P., & Koehler, M. J. (2006). *Technological pedagogical content knowledge: A framework for teacher knowledge*. *Teachers college record*, 108(6), 1017.
28. Ochuku, I.G., Amakaino, U.J.D., & Chamberlain, K.P. (2013). *Utilization of E-Learning Technologies in Business Education Instructional Delivery in Colleges of Education in Delta State of Nigeria*. *International Journal of Education and Research*, 1(10), 1–13.
29. Osakwe, R. N. (2013). *The impact of information and communication technology (ICT) on teacher education and its implication for professional development in Nigeria*. *Education*, 3(2).
30. Oye, N. D., Iahad, N. A., & Rabin, Z. A. (2011). *A model of ICT acceptance and use for teachers in higher education institutions*. *International Journal of Computer Science & Communication Networks*, 1(1), 22–40.
31. Palomino, M. del C. P. (2017). *Teacher Training in the Use of ICT for Inclusion: Differences between Early Childhood and Primary Education*. *Procedia - Social and Behavioral Sciences*, 237(June 2016), 144–149. <https://doi.org/10.1016/j.sbspro.2017.02.055>.
32. Raman, A., Utara, U., Khalid, R., Utara, U., & Hussin, F. (2014). *Technology Acceptance on Smart Board among Teachers in Terengganu Using UTAUT Model*. *Canadian Center of Science and Education Technology*, (May). <https://doi.org/10.5539/ass.v10n11p84>.
33. Ringle, Christian M., Sarstedt, Marko, Smith, Donna, Reams, Russell, Hair Jr, J. F. (2014). *Partial Least Squares Structural Equation Modeling (PLS–SEM): A Useful Tool for Family Business Researchers*. *Journal of Family Business Strategy*, (March), 1–11. <https://doi.org/10.1016/j.jfbs.2014.01.002>.
34. Salinas, Á, Nussbaum, M., Herrera, O., Solarte, M., & Aldunate, R. (2017). *Factors affecting the adoption of information and communication technologies in teaching*. *Education and Information Technologies*, 22(5), 2175–2196.

35. Sang, G., Valcke, M., van Braak, J., Tondeur, J., & Zhu, C. (2011). Predicting ICT integration into classroom teaching in Chinese primary schools: exploring the complex interplay of teacher-related variables. *Journal of Computer Assisted Learning*, 27(2), 160-172.
36. Sang, G., Valcke, M., Van Braak, J., & Tondeur, J. (2010). Student teachers' thinking processes and ICT integration: Predictors of prospective teaching behaviors with educational technology. *Computers & Education*, 54(1), 103–112.
37. Taylor, S., & Todd, P. A. (1995). Understanding information technology usage: A test of competing models. *Information systems research*, 6(2), 144–176.
38. Teo, T. (2009). Modelling technology acceptance in education: A study of pre-service teachers. *Computers & Education*, 52(2), 302–312.
39. Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS quarterly*, 425–478.
40. Vitanova, V., Atanasova-Pachemska, T., Iliev, D., & Pachemska, S. (2015). Factors Affecting the Development of ICT Competencies of Teachers in Primary Schools. *Procedia - Social and Behavioral Sciences*, 191, 1087–1094. <https://doi.org/10.1016/j.sbspro.2015.04.344>.
41. Wambiri, G. N., & Ndani, M. N. (2017). Kenya Primary School Teachers' preparation in ICT teaching: teacher beliefs, attitudes, self-efficacy, computer competence, and age. *African Journal of Teacher Education*, 5(1).