

Perceptions of the Usage of WhatsApp for Instruction: A Study of Teachers in Senior High Schools in Ghana

Frederick Owusu-Boakye; Abednego Kofi Bansah; Justice Armah
University of Cape Coast, Central Region, Ghana

Abstract: The free education policy at the senior high school levels in Ghana resulted in an increase in enrollment numbers which subsequently lead to the adoption of the double track system which necessitated the need to divide students into two tracks. This meant that while one track was in school, the other was on vacation. As such, an innovative way is needed to keep students' engage especially a track that is on vacation. The purpose of this research was to determine the perception of teachers on the usage of WhatsApp messenger for teaching and learning. A cross-sectional design was employed in this study among 125 senior high school teachers within Tema Metropolis of Ghana. The research revealed that, perceived cost had an effect on teachers perceive usefulness, perceived convenience, perceived effectiveness, perceived trust and perceived intention to use WhatsApp Messenger for teaching and learning. Perceived convenience had a more pronounced effect on perceived usefulness. Implications of the results for scaling up or developing reforms on regular stakeholder's consultations to understand the concept of using WhatsApp messenger for teaching and learning in high schools with similar context are discussed.

Keywords: WhatsApp; Instruction; Perceived Usefulness; Perceived Convenience; Intention to Use

I. INTRODUCTION

For the past decade, the world continues to encounter correspondence insurgency through technological headway and the education sector is no exception to this insurgence. Tools such as WhatsApp, Twitter, LinkedIn Learning, and YouTube continue to impact teaching and learning. This has compelled teachers to re-think their instructional methods to enhance the way students learn (Mynbayeva & Sadvakassova, 2018). The 21st century teacher is able to connect with students utilizing any accessible online networking channels at their very own pace (Mynbayeva & Sadvakassova, 2018). One important social networking tool that has received significant usage in the learning environment is the WhatsApp Messenger (Devi et al., 2019; Jadhav et al., 2013). The integration of WhatsApp in teaching can greatly enhance the quality of learning (Susilo, 2014) and has been viewed as a compelling correspondence and community-oriented tool for teaching and learning due to its favourable circumstances over different types of online networking devices (Willemse 2015). WhatsApp is viewed as a tool that can encourage critical discussion, information sharing among students and teachers, improve students' manipulative

abilities, encourage the learning procedure and cultivate assessment process (Barhoumi, 2015; Lauricella & Kay, 2013). It also helps students build their very own insight (Namaziandost & Nasri, 2019), improve correspondence, imagination, basic reasoning and critical thinking aptitudes (Namaziandost & Nasri, 2019; Willemse 2015) as well as information handling skills and problem-solving capacity (Willemse, 2015).

Policies related to education continue to revolve around the world and Ghana educational system is not different. Apart from curriculum policies, one major reason for revolving policies is to increase the intake of learner numbers (Acedo, 2008). One of such policy was the established Free Compulsory Universal Basic Education (FCUBE) policy by the government of Ghana in 2006 which reported a significant increase of school enrolment (Darvas & Balwanz, 2014). To give opportunity for the many basic school leavers to gain entrance into second cycle education as a result of the FCUBE, the government of Ghana introduced the free Senior High School (SHS) policy (Mensah, 2019). Enrolment into free senior high schools during its first implementation for first years increased by almost 63% (Mensah, 2019) with 33.2% increment reported for overall enrolment. As a result of the large enrolment, a lot of pressure was put on the current resources available (Deho & Agangiba, 2019). The inadequate resources to accommodate the large numbers within the scheduled academic calendar prompted the definition of the twofold track instruction framework (Mensah, 2019). This arrangement necessitates that the whole students and staff be partitioned into two tracks, with the end goal that, while one track is in school, the other is on vacation (Mensah, 2019). While this method was a laudable one, keeping students unengaged lead to an outcry of this system as concern was raised especially by parents who had their wards in final year of schools.

Promoting outreach to students on holidays with learning opportunities through technology could help complement the inadequate resources. At the senior high school level of Ghana, the Ministry of Education (MOE) and Ghana Education Service (GES) have begun to coordinate ICT as a subject of concentration in the educational plan. Recently, there has been a call on the introduction of an electronic learning programme to complement the double-

track system introduced in the country's SHS (Essah-Hienoo, 2018). This could afford students the opportunity to access recorded lectures on various topics and soft copies of other educative materials on a public online portal to prevent students from losing focus on their academic agenda. While there is a great deal of knowledge about how WhatsApp as a lever is used for having access to cooperatively-created resources, heightening on assignment conduct and promoting important context-free learning (Rambe et al., 2013), there is paucity of data in relation to WhatsApp and its application for instruction in Ghana. The implementation of the double track senior high school system has no doubt improved access to senior high schools however the challenges associated with it remain daunting (Deho & Agangiba, 2019; Mensah, 2019) and as such, any innovative ways to academically reach students and keep them occupied cannot be overstated. WhatsApp has been used as a platform to complement other instructional delivery methods (Bouhnik & Deshen, 2014; Smith, 2015) and it with this background that this current study proposed to determine senior high school teachers perception of the use of WhatsApp messenger for teaching and learning. This study aimed at gaining understanding into the WhatsApp messenger and intention to use it for teaching and learning. Specifically, the study aimed to advance understanding of the antecedent factors: perceived cost, perceived trust, perceived usefulness, perceived convenience, perceived effectiveness, the effect between them and the extent of these effect on the intention to use it for teaching and learning among senior high school teachers.

II. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Perceived Cost (PCT)

Studies have used TAM in the prediction of technology acceptance as this model has been validated and believed to be prominent in the examination of technology adoption (Park et al., 2014; Purnomo & Lee, 2013). TAM has been further extended with several sets of acceptance determinants for developing subsequent prominent models capable of better predicting user's behaviour across different fields of application (Venkatesh et al., 2012). Cost, inadequate infrastructure and human capabilities have been identified as other variables of TAM (Harfoushi & Obiedat, 2011; Nneka, 2010). Perceived cost also referred to as perceived value (Kim et al., 2019) is incurred in the process of technology acquisition or adoption (Machogu & Okiko, 2012) which might include but not limited to the cost of hardware, stable supply of power, employment and retaining technicians as well as e-training (Zainab et al., 2017) and planning, organizing and putting the new system into practice (Machogu & Okiko 2012). For instance, the standard of e-training platforms to be provided is contended to be affected by cost (Özbek et al. 2015) due to these relative costs associated with a technology adoption (Machogu & Okiko 2012). Also, the standard of electronic training platforms to be provided is contended to be affected by cost (Özbek et al., 2015). Several studies have investigated perceived cost and intention to use

(Sobti, 2019; Kim, et al., 2019). In the health sector for instance Cajita et al (2017) investigated features that influence the use of mHealth among patients with heart failure and identified that perceived cost was not associated with intention to use. In the financial sector Yang et al (2012) investigated the use of mobile payments system in China and found relative advantage as the most important factor and perceived cost as the least important factor. On the contrary, Zainab et al (2017) showed that perceived cost to have a significant effect on e-training adoption. An outcome further reiterated in a study conducted by Sobti (2019) who identified that perceived cost significantly correlate with behavioural intention. The benefits of online learning include low cost of technology (Almahasees et al., 2021) and the low cost that might be associated with the usage of WhatsApp messenger in a complementary nature with instruction could promote its usage. For the purpose of the hypotheses related to cost, this current study assumed that SHS teachers might presume that: a) the extra cost that might be incurred by management of schools might lead to some resistance (less trust) in supporting the future use of WhatsApp for complementary instruction and b) there is low cost associated with using WhatsApp for instruction, hence, teachers might perceive it as effectiveness, usefulness, convenient and subsequently have the intention to use it future support are rendered for its usage. As such, this current study hypothesized that:

H1: Perceived cost associated with WhatsApp usage for teaching has a negative effect on SHS teachers perceived trust.

H2: Perceived cost associated with WhatsApp usage for teaching has a positive effect on SHS teachers' perceived effectiveness.

H3: Perceived cost associated with WhatsApp usage for teaching has a positive effect on SHS teachers' perceived convenience.

H4: Perceived cost associated with WhatsApp usage for teaching has a positive effect on SHS teachers' perceived usefulness.

H5: Perceived cost associated with WhatsApp usage for teaching has a positive effect on SHS teachers' perceived intention to use.

Perceived Effectiveness (PE)

The use of computers, mobile devices, and the Internet is at its highest level to date and expected to continue to increase as technology becomes more accessible, particularly for users in developing countries (Poushter, 2016). It has been an instrument for achieving social, economic, educational, scientific and technological development (Adedeji, 2010). The application of Information Communication Technology (ICT) is not only emphasized in corporative business and the industrial sector, but it is an essential part of education at all levels (Allen, 2011). Since the 1900s, administrators and faculty have grappled with how to effectively use technical innovations such as video and audio recordings, email, and teleconferencing to augment or replace traditional instructional delivery methods (Kaware & Sain, 2015;

Westera, 2015). Many previous researches have proven that the usage of ICT in teaching and learning process could improve students' achievement (Nakayima, 2011, Jamieson-Proctor, et al., 2013). Effective use of technology requires proper integration to make it more productive and foster educational development which also entails proper utilization of information resources and the technology that promote its usage (Erişti et al., 2012, p.30). Perceived effectiveness has been defined in several literature. For instance, Coursaris et al (2012) referred to it as the ability of users to complete tasks using the technology, and the quality of output of those tasks. Also, perceived effectiveness of technology use has been further expanded by the work of Lowerison et al., (2006, p. 468), In this context we define perceived effectiveness as the tendency of technology to have a persuading impact on its users. Social media technologies such as WhatsApp is at its highest level and expected to continue to increase as the social media becomes more accessible, particularly for users in developing countries (Poushter, 2016). Several studies support the effectiveness of social media for achieving educational goals (Blaschke, 2014; Ihlebæk & Larsson, 2018; Li, 2017; Moghavvemi et al., 2018). For instance, self-perceived effectiveness has also been reported to significantly influence the intention to use mobile medical apps among older adults (Askari et al., 2020). With the proliferation of social media and the debate over the cost of educational technologies will linger (Moyle, 2007), several students use their own technology to support their learning. At their own time students use technology to share knowledge, confirm their knowledge and to share learning resources. the opportunities that social media technologies present for teaching and learning in schools is enormous (Kaware & Sain, 2015; Westera, 2015). Though some studies suggest that the distractive nature of technology is likely to affect its effectiveness for teaching and learning (Coursaris, et al., 2012). We are of the view that effectiveness of digital technology for learning can be influenced by the teachers' pedagogical praxis, the interactivity of the learning, the quality of the learning system (Liaw, 2008). WhatsApp has proven to be interactive, and support the collaborative learning tenets. Moreover, younger people and students who have used social media to support their learning are more likely to confirm the effectiveness of social media for teaching and learning (Suka et al., 2017) and as such, this current study hypothesized that:

H6: Perceived effectiveness associated with WhatsApp usage for teaching has a positive effect on SHS teachers' perceived usefulness.

H7: Perceived effectiveness associated with WhatsApp usage for teaching has a positive effect on SHS teacher's perceived intention to use.

Perceived Convenience (PC)

In terms of user evaluation of service experiences, the term convenience refers to an individual's preference for convenient product and services (Hsu & Chang, 2013). Convenience can also be viewed as the use of an information

system or technology by five dimensions namely: time, place, acquisition, use, and execution (Brown, 1989). The 'ease of use' is reported as a determinant of the convenience construct and as such perceived ease of use positively influences users' perception of convenience in the usage of a technological system (Brown, 1989).

Convenience to use have been identified as predictor of intention to use in the business and tourism sector. For instance Chen and Tsai (2019) integrated TAM and Information system success model to present a model that explores users' intention to use a personalized location-based mobile tourism application and established that perceived convenience had significant influence on intention to use the application. Not only has perceived benefit of using technology been associated with convenience of using the technology (Kvavik, 2005) but perceived convenience has been cited as an antecedent factor that affect intention to use a mobile technology or system (Gupta & Kim, 2007). Contrary, Yoon and Kim (2007) are of the view that convenience in accessing technology is not definitely related to intention to use technology, and convenience in use is similar to ease of use in TAM. However, Hossain and Prybutok (2008) proposed that convenience include both ease of use and usefulness. A study on investigating English learning through PDAs showed a significant positive effects of perceived ease of use on perceived convenience, perceived convenience on perceived usefulness, and perceived convenience on attitude toward using PDAs (Chang et. al., 2012). Therefore, relationships between perceived convenience and TAM variables require further examination; while this is not the focus of the current study, we operationalized perceived convenience in the study based on the perspective provided by Yoon and Kim (2007). Consequently, we defined perceived convenience as a level of convenience toward time, place and execution that one feels when using WhatsApp for instruction purposes. Thus, if one could perform a task at any time, perform the task at any place or perform a task with ease when using the WhatsApp, then he or she feels more convenient toward time, place and execution respectively. Accordingly, the study advocates that favourable perceived convenience of WhatsApp use will promote high acceptance and usage, thus, this current study hypothesized that:

H8: Perceived convenience associated with WhatsApp usage for teaching has a positive effect on SHS teachers' perceived usefulness.

H9: Perceived convenience associated with WhatsApp usage for teaching has a positive effect on SHS teachers' perceived intention to use.

Technology adoption model (TAM): Perceived Usefulness (PU)

The features and characteristics of TAM are reported to serve as variables to determine whether a system will be accepted or rejected (Suorsa & Eskilsson, 2014) and has been verified in this regard in various studies (Buabeng-Andoh, 2021; Durodolu, 2016; Lai, 2017a; Lai, 2017b; Lai & Zainal,

2015; Rafique, et al., 2020). Other research has confirmed that TAM is a valid model that represents an important theoretical framework to explain and predict technology acceptance behaviour (Al-Gahtani, 2014; Hsia et al., 2014; Lee et al., 2014; Tarhini et al., 2014; Wu & Zhang, 2014). One of the important constructs in TAM is reported to be perceived usefulness (Chen *et al.*, 2019) and has proven to be a very important factor for technology adoption in most recent studies (Yeh & Teng, 2011). For instance, PU is reported to be positively associated with continuance intention in the context of e-text (Baker-Eveleth & Stone, 2015; Stone & Baker-Eveleth, 2013), instant messaging (Wang et al., 2011), mobile service provider (Abbas & Hamdy, 2015), online travel services (Li & Liu, 2014), e-learning (Lin & Wang, 2012), blog learning (Tang et al. 2012) and predictor of behavioural intention to use technology of interest (Park, et al., 2014; Buabeng-Andoh, 2021). In this current study context, PU is explained as the belief that SHS teachers have in the usefulness of WhatsApp to support their teaching and learning outcomes while the construct intention to use is presented as behavioural intention to use WhatsApp. Considering that WhatsApp remains one of the most popular social media app for messaging and sharing of information and resources within the learning environment, this current study hypothesized that:

H10: Perceived usefulness of WhatsApp for teaching has a positive effect on SHS teachers' perceived intention to use.

Perceived Trust (PT)

The universal definition of trust remains debatable (Gefen et al., 2003) due to the diverse definitions related to the various disciplines viewpoint of trust (Setiawan & Achyar, 2012). Not only has trust and familiarity have been cited to influence E-commerce (Maqableh, et al., 2015) but ease of use, usefulness, attitude, trust and risk has been reported to increase the intention of use (Liébana-Cabanillas, et al., 2014). Customer trust been reported to play a critical role in hindering fears related to using mobile internet services as well as motivating customers to adopt such systems (Hollingsworth & Dembla, 2013; Sadi & Noordin, 2011). Other studies have also support the role of trust in shaping a positive customer perception about the values and benefits of using mobile internet (Aloudat, et al., 2014; Zarpou et al., 2012). Perceived trust has not only been found to be positively related to perceived usefulness of m-banking (Cruz-Benito et al., 2019) but also have been cited to have a positive association with perceived continuance intention to use the payment platforms (Shao, et al., 2019; Aref & Alshahri, 2021). Teachers perceiving that they might receive future supporting in using WhatsApp as a complementary instruction medium might have the perceive intention to use this technology as a complementary means of instruction. Little is known about it's effect on the use of social media in teaching and learning. research is clearly needed to examine the effect of trust on teachers' intention to use WhatsApp for teaching and learning. Based on the above review, this current study hypothesized that:

H11: Perceived trust associated with WhatsApp usage for teaching has a positive effect on SHS teachers' perceived intention to use.

Figure 1 represented the theoretical model of the study.

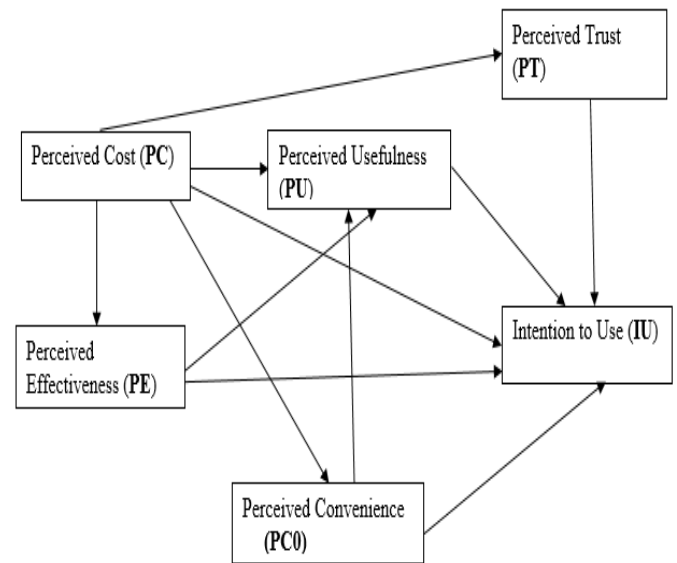


Figure 1: Research Model

III. METHODS

Study design and sample

A cross-sectional study (Pelham & Blanton, 2006) was conducted among 213 SHS teachers obtained purposively (Johnson & Onwuegbuzie, 2004) based on Yamane (1973) formulae within an industrial Metropolis of the capital Ghana. The industrial metropolis is among the most well-organized communities in Ghana with some of the well-resourced senior high schools in Ghana. Of the 6 schools, 1 school was purposively used as a pilot study site due to its obscured location.

The data was collected online through participants schools' listserv. Majority of the respondents were between the ages of 31-36 year (n=91) and teaching experience between 11-15 years (n=97). These participants (81%, n=172) had high levels of access to digital technologies (particularly smart phones) with all of them as WhatsApp users.

Data Collection and Instrument

The study was a self-reported survey that utilized questionnaire as an instrument for data collection. Prior to data collection, Institutional Review Board approval was sought as well as a pilot study conducted to validate the questionnaire. The questionnaire was made up of two main sections, sections A and B. Section A sought demographic information of the respondents. Section B contained the 25 scale items for the latent variables namely Perceived Usefulness (PU),

Table 1: Operational Definitions for Latent Variables of the Study and Measured Items

Latent Variable	Operational definition	Measured Items
Perceived Usefulness (PU)	Extent to which teachers enhance their learning (performance and productivity of the lesson) via WhatsApp	PU01: Using WhatsApp can improve the delivery of my course.
		PU02: Using WhatsApp can improve my productivity in my course delivery.
		PU03: Using WhatsApp can enable me to have more accurate information for my students.
		PU04: Using WhatsApp can make it easier to do my tasks as an instructor.
		PU05: Using WhatsApp is useful in my study.
Perceived Effectiveness (PE)	The extent to which WhatsApp enhanced the delivery of the lesson in terms of organising content and other technologies	PE01: WhatsApp can make content of the lesson to be well delivered.
		PE02: WhatsApp can make organization of the lesson appropriate, logical and clear.
		PE03: WhatsApp can ensure that the lesson was well supported by examples.
		PE04: The activities within WhatsApp makes me identify the importance of learning with the aid of technology.
		PE05: I feel empowered by using WhatsApp.
Perceived Convenience (PC)	The level of convenience toward time, place and execution that one feels when pursuing a task via the WhatsApp	PCo01: WhatsApp is easy to use.
		PCo02: It is easy to get WhatsApp to do what I want it to.
		PCo03: Using WhatsApp can improve my objectives for clear and understandable course delivery.
		PCo04: Interacting with WhatsApp does not require a lot of mental effort.
		PCo05: It is easy to find information through the usage of WhatsApp.
Perceived Trust (PT)	The level of expectation or support about the future behavior.	PT01: My school would provide means for internet for using WhatsApp messenger for teaching.
		PT02: My school would provide means for obtaining an electronic device for teaching.
Perceived Cost (PCT)	The cost incurred in as a result of WhatsApp usage	PCT01: Using WhatsApp could mean internet cost for me.
		PCT02: Using WhatsApp could mean obtaining an electronic device.

Table 2: Cont.

Latent Variable	Operational Definition	Measured items
Intention to Use (IU)	The desire to use WhatsApp to teach in the future	IU01: I can use WhatsApp to get more information from colleagues concerning my subject.
		IU02: WhatsApp can provide an attractive working environment.
		IU03: Using WhatsApp can be a pleasant experience.
		IU04: I believe it will be a good. idea to use WhatsApp for teaching my courses.
		IU05: Knowing how to use any form of electronic device is a worthwhile skill.
		IU06: I have a generally favourable attitude towards using WhatsApp as a cheaper means of instruction.

Perceived Cost (PCo), Perceived Effectiveness (PE), Perceived Trust (PT), Perceived Convenience (PC) and Intention to Use (IU). Questions based on Perceived Usefulness was adapted from Davis (1989). Items on Perceived Cost and Intention to use were adapted from Özbek et al (2015), Perceived Effectiveness was adapted from the work of Lowerison, et al., (2006). Items under the Perceived Trust were adapted form Maqableh et al (2015). Finally items under the Perceived Convenience were adapted from Yoon and Kim (2007). The operational definitions for latent variables of the study and measured items are summarized in table 1.

Data Analysis

IBM Statistics 25.0 was used for descriptive analysis and IBM AMOS 22.0 was then, employed for the structural equation modelling technique. A Cronbach alpha coefficient of .909 was obtained for the pilot study. This value was above 0.70 and deemed acceptable (Warner, 2013). For all the latent variables, a four-point Likert scale (1 = strongly disagree, 4 = strongly agree) was used. The scores were interpreted as follows: 1 is the lowest possible score, which represents a very strong negative perception, while 4 is the highest possible score which represents a very strong positive perception. Table 2 shows the reliability analysis and convergent validity of items of the constructs for the latent variables used in the study.

Table 2: Reliability Analysis and Convergent Validity of Items of the Constructs

Latent Variable	Mean	SD	AVE	CR	1	2	3	4	5	6
1Perceived Usefulness	3.1936	.5351	.608	.885	(.844)*					
2Perceived Cost	3.4040	.6080	.600	.744	.561	(.744)*				
3Perceived Effectiveness	3.1328	.5541	.652	.737	.567	.287	(.831)*			
4Perceived Trust	2.2000	1.0865	.910	.952	.110	-.251	.151	(.901)*		
5Perceived Convenience	3.1328	.5541	.748	.805	.200	.290	.293	.301	(.782)*	
6Intention to Use	3.4933	.4856	.640	.761	.500	.744	.736	.088	.381	(.864)*

*Cronbach's Alpha

III. RESULTS

The mean, standard deviation, reliability values, and the convergent validity of items of the latent variables, and correlations between these variables are presented in Table 2. The Cronbach’s alpha values were at least 0.7 and deemed as high reliability (Nunnally & Bernstein, 1994). Exploratory factor analysis (EFA) of variables related to the items of the survey were assessed. Results, reported a KMO value of .880 (Sharma, 1996), and Bartlett’s Test of Sphericity was significant (Eyduran, Topal & Sonmez, 2010), an indication that the sample of the study was adequate to perform EFA. The EFA results reported factor weights of items with total explained variance with five factors was 83.593. Summary of EFA results were presented in Table 3. Composite reliability (CR) and average variance extracted (AVE) values were presented (Table 2). Values for CR and AVE were higher than 0.7 (Hair et al., 2010) and 0.5 (Fornell & Larcker, 1981) respectively. Based on the CR and AVE values which estimated convergent validity (Hair et al., 2010) the research model was tested with structural equation modeling (SEM). The results of SEM were demonstrated in Figure 2.

Table 3: Exploratory Factor Analysis Results

Measured Items					
PU01	.625				
PU02	.756				
PU03	.639				
PU04	.571				
PU05	.618				
PE01		.400			
PE02		.582			
PE03		.709			
PE04		.532			
PE05		.592			
PC01			.766		
PC02			.730		
PC03			.750		
PC04			.703		
PC05			.563		
PT01				.559	
PT02				.713	
PCT01					.660
PCT02					.610
IU01					.590
IU02					.798
IU03					.545
IU04					.627
IU05					.884
IU06					.876

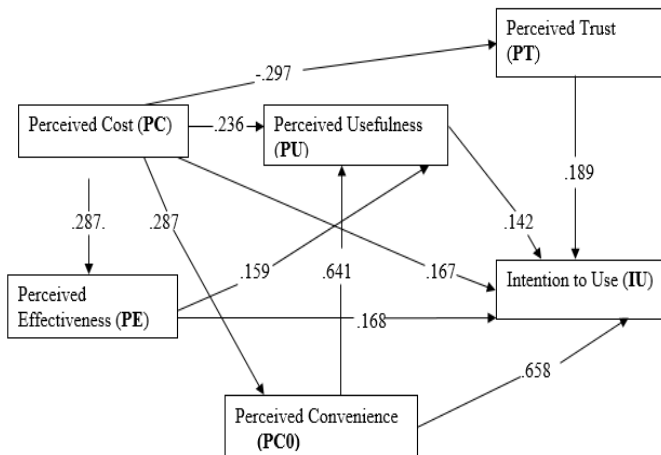


Figure 2: Result model

Analysis of the model’s goodness of fit indices indicated a model structure that well fitted the SEM (CMIN/DF: 2.563, p: .073, SRMR: .034, RMSEA: .056, CFI: .935, TLI: .941, GFI: .971, NFI: .961) (Bentler, 1990; Hair et al., 2010). Table 4 summarized the results of the models’ hypotheses.

Table 4: Structural Equation Modeling Results

Hypotheses	Independent variable	Dependent Variable	Standardized β	Sig	Results
1	Perceived cost	Perceived trust	-.297	.000	Fail to reject
2	Perceived cost	Perceived effectiveness	.287	.000	Fail to reject
3	Perceived cost	Perceived convenience	.287	.000	Fail to reject
4	Perceived cost	Perceived usefulness	.236	.001	Fail to reject
5	Perceived cost	Intention to use	.167	.006	Fail to reject
6	Perceived effectiveness	Perceived usefulness	.159	.010	Fail to reject
7	Perceived effectiveness	Intention to use	.168	.004	Fail to reject

8	Perceived convenience	Perceived usefulness	.641	.000	Fail to reject
9	Perceived convenience	Intention to use	.658	.000	Fail to reject
10	Perceived usefulness	Intention to use	.142	.014	Fail to reject
11	Perceived trust	Intention to use	.189	.003	Fail to reject

The first hypothesis of the research assumed that perceived cost would negatively affect perceived trust. The results showed that perceived cost negatively affected perceived trust ($\beta = -.297$), thus the H1 was supported. The next four hypotheses of the research assumed that the perceived cost would positively affect perceived effectiveness, perceived usefulness, perceived convenience and intention to use. The results indicated that cost perception positively affects perceived effectiveness ($\beta = .287$), perceived usefulness ($\beta = .236$), perceived convenience ($\beta = .287$) and intention to use ($\beta = .167$). Thus, H2, H3, H4 and H5 were accepted. Two more hypotheses of the research also assumed that the perceived effectiveness would positively affect perceived usefulness and perceived intention to use. The result indicated perceived effectiveness positively affected perceived usefulness and intention to use with β values of .159 and .168 respectively. These two hypotheses (H6 & H7) were accepted. A further two hypotheses of the research (H8 & H9) further assumed that the perceived convenience would positively affect perceived usefulness and perceived intention to use. The result supported these hypotheses with reported β values of .641 and .658 respectively. Perceived usefulness was further hypothesized to positively have an effect on perceived intention and this hypothesis, H10, was accepted with a β value of .142. The final hypothesis, H11, assumed that the perceived trust would affect perceived intention to use. The results showed that perceived trust positively affected perceived intention to use ($\beta = .189$), thus the H11 was also supported.

IV. DISCUSSIONS

The current study proposed to determine senior high school teachers perception of the use of WhatsApp as complementary instruction medium. Results based on SEM, reported a goodness of fit of the indices of the research model were within the acceptable limits, and all developed hypotheses were supported. The most interesting finding of the study was that perceived convenience demonstrated the expected effects on both perceived usefulness and perceived intention to use the technology. Thus, the results showed that the convenience associated with using WhatsApp messenger caused the perceived usefulness of the technology and teachers subsequent perceived intention to use the technology for teaching (H8 & H9). Convenience to use have been identified as predictor of intention to use a technology (Chen & Tsai, 2019; Baek et al., 2008). These effect could be as a result of this present study participants viewing the convenience in relations to place, time, and execution. For instance, Chang et

al (2012) investigated English learning through PDAs and identified significantly positive effects of perceived ease of use on perceived convenience, perceived convenience on perceived usefulness, and perceived convenience on attitude toward using PDAs.

Participants perceived cost associated with using WhatsApp messenger on perceived trust demonstrated a negative impact on the perceived trust in participants level of expectation or support they might receive in the future in order to use technology for teaching (H1). While the role of trust in shaping a positive perception about the values and benefits of using a technology (Aloudat et al., 2014; Zarpou et al., 2012; Zhang et al., 2010), the perceived cost involved in the acquisition of the system usage by institutions (Machogu & Okiko, 2012) might result in the participants less trusting that they might have support to implement the usage of the technology for teaching. Cost, inadequate infrastructure and human capabilities have been identified as other variables of technology acceptance model (Harfoushi & Obiedat 2011; Nneke Eke, 2010). Also, perceived cost has been argued to be a barrier to technology usage and adoption (AlSoufi & Ali 2014; Fonchamnyo, 2013). For instance, Zainab, et al (2017) researched into factors affecting e-training adoption among 450 heads of department in 27 federal ministries in Nigerian and revealed that perceived cost had a significant effect on e-training adoption.

Comparatively, senior high teachers believing that the less cost associated with using WhatsApp messenger for teaching could promote teaching that will be effective (H2), convenient (H3), useful (H4) and subsequently their perceived intention to use (H5) this technology for teaching. These outcomes further reiterates majority of the participants having access to high levels of technology and all of them being WhatsApp users. This finding is congruent with Sobti (2019) who identified that perceived cost significantly correlate with behavioural intention. The relation between cost and benefit pay a significant role to both perceived usefulness and ease of use (Lule, 2008). People perception of an acceptable cost of technology may adopt it more easily and then use it (Micheni et al., 2013). It is reported that social media technologies such as WhatsApp is at its highest level and is expected to continue to increase as the social media becomes more accessible, particularly for users in developing countries (Poushter, 2016). Schools have long been concerned about the convenient access (Levin & WadMany, 2008), and convenient use of technology for preparing and reusing digital learning materials (Baek et al., 2008) which this technology could

provide. Furthermore, perceived usefulness and ease to use have direct effect on intention to use technology of interest (Park, et al., 2011; Buabeng-Andoh, 2021).

Perceived effectiveness has been defined as the ability of users to complete tasks using the technology, and the quality of output of those tasks (Coursaris, et al., 2012). At their own time students use technology to share knowledge, confirm their knowledge and to share learning resources. The opportunities that social media technologies present for teaching and learning in schools is enormous (Kaware & Sain, 2015; Westera, 2015). Effectiveness of digital technology for learning can be influenced by the teachers pedagogical praxis, the interactivity of the learning, the quality of the learning system (Liaw, 2008). An assertion that might have influenced participants of this current study to demonstrate an effect of perceived effectiveness on both perceived usefulness (H6) and intention to use (H8). Moreover, younger people and students who have used social media to support their learning are more likely to confirm the effectiveness of social media for teaching and learning (Suka et al., 2017). A characteristics these participants have with majority of them being between the ages of 31 to 36.

Perceived Usefulness is one of the crucial determinants among many variables that influence system use (Davis, 1989) and has been cited in numerous studies as a very important factor for technology adoption (Chen et al., 2019; Buabeng-Andoh, 2021; Yeh & Teng 2011). In adopting a new system, it is stated that the ease of use of the system has a strong impact on the end users' perception of its usefulness (Ma & Liu, 2005). Furthermore, perceived usefulness is a significant predictor of user adoption behaviour (Chitungo & Munongo, 2013; Marumbwa & Mutsikiwa, 2013), an assertion reiterated by this current study (H10).

The intention of a user to engage in the usage of a technology is also dependent on the levels of trust in a service provider (Masinge, 2010). The outcome of this study revealed an effect of trust, that is, the level of expectation or support about the future usage of the technology on perceived intention to use (H11). Perceived trust of the customers has been reported to be positively associated with perceived continuance intention to use payment platforms (Aref, & Alshahri, 2021; Shao, et al., 2019). This outcome is also consistent with the works of Chitungo and Munongo (2013) who reported perceived trust to have a significant influence on the adoption of mobile financial services.

V. CONCLUSION

The current study proposed to determine senior high school teachers perception of the use of WhatsApp as complementary instruction medium. The study revealed perceived convenience as a major factor that demonstrated the perception of the usefulness and subsequent intention to use WhatsApp messenger for teaching. With the current school calendar which follows a double track system where a section of students are home while others are in school, the use of WhatsApp to promote convenient learning especially for those

at home cannot be overstated. Ultimately for an effective students engagement, WhatsApp could promote a convenient and useful means that can complement other methods or medium of lesson delivery. It will be prudent to have management/stakeholders of schools to encourage or institute a policy for the use of this technology by providing resource that can necessitate its usage, especially with all the respondents having diverse technological devices and are user of the WhatsApp messenger. Such a policy could reiterate Mensah (2019) assertion of promoting long term benefits aimed at improving the human capital base of the country through an increase in the level of literacy among the Ghanaian population, especially with the current increases in enrolments due to abolition of school fees.

While various studies have been conducted in terms of the application of social media platforms for teaching and learning, the paucity of data related to perceived cost, trust, convenience, effectiveness, and usefulness with respect to the intention to use WhatsApp messenger for teaching might affirm that the current study is unique in this respect, and as such it is expected to contribute to literature crucially. This study was limited in some aspects. First, the participants of the study were only from one Metropolis within a region in Ghana. As a result, generalization of the findings should be done consciously. This is the case because, diverse findings could be derived from participants from different metropolis within the regions around the country.

With the current popularity in online classes, WhatsApp grants both the teacher and students diverse ways to engage each other through direct communication. As such, it is paramount for heads of high schools to encourage the use of this social media tool by providing resources that can promote its usage for academic purposes and as such, there is also the need to facilitate guidelines in order to formulate strategic ways of using WhatsApp messenger for collaborative learning among students. Extending this research within other parts of the country in the future will contribute not only to the literature, but will enhance the validity of the model as well as present senior high teachers view on the application of social media for instructions. Second, using a cross-sectional type of study may report findings which may not be applicable in the future because people perception changes as they progress in the adoption journey as a result this study recommends a longitudinal research to be conducted in order to better understand the influences of teachers continuance to use technology for instruction.

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