



ICT and Language Learning Interconnections: A Review of the Literature

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Abstract— The effects of information and communication technologies (ICT) in the field of education have long been discussed and argued by many educational scholars worldwide. Today's youths are surrounded by information technologies. They use and interact with digital media on a constant basis, to the point where it becomes part of their daily lives. The current review provides clear evidence about the complex nature of social media and its relationship with language teaching and learning—an issue that has perplexed numerous scholars and led to controversial views. While some scholars blame social media for being a source of distraction, others view it as a valuable educational tool, and others take a balanced approach, highlighting its pros and cons. Given that social media utilization is a behavior, this study provides a critical synthesis of theoretical and empirical research and highlights several relevant theories, on top of which comes the Unified Theory of Acceptance and Use of Technology (UTAUT) model, which offers a theoretical framework for probing students' perceptions and attitudes towards technology adoption. The studies reviewed in this paper highlight learners' perceptions of and attitudes towards the use of ICT in the learning process, and the present review aims to provide valuable insights for education stakeholders.



Keywords— ICT, learning outcomes, correlational research, UTAUT model

I. INTRODUCTION

Over the past few decades, it has been axiomatic to assert that the Internet is one of the greatest developments in history. The advent of the Internet has dramatically altered human life and brought about changes in all aspects of life. Education, a socially oriented activity, is no exception. It has been dramatically affected by the rapid advances in information and communication technology (ICT) and, more precisely, by the birth of social media, which is gradually gaining momentum. ICTs have the potential:

to accelerate, enrich, and deepen skills; motivate and engage students in learning; helps to relate school experiences to work practices; helps to create economic viability for tomorrow's workers; contributes to radical changes in school; strengthens teaching, and provides opportunities for connection between the school and the world.

(Davis & Tearle, 1999; Lemke & Coughlin, 1998, as cited in Yusuf, 2005, p. 316)

The literature is abundant with reading materials highlighting the benefits of technology in education. With the rise of ICT, the teaching-learning paradigms have been revolutionized, and teachers and learners' traditional roles have been radically transformed. Such roles are identified by Wheeler (2001) as a shared learning process, shared learning spaces, promotion of collaborative learning and a move towards autonomous learning. Students have become lifelong autonomous and cooperative learners who are responsible over their own knowledge, whereas teachers are knowledge facilitators, advisors, coaches and leaders. In other words, the teaching-learning process has witnessed a shift from teacher-centered to learner-centered mode.

The use of ICTs in education and the resulting attainment outcomes was and still is a debatable issue. An in-depth

examination of the relevant literature reveals that students' frequency of use and the time they spend on social technologies pose various concerns for quite many parents, teachers and scholars. Different uses of social networking sites and how "users use technology is a determining factor which impacts students' productivity" (Lakhal, 2020, p. 109). While some students use social technologies judiciously, others use them for entertainment goals. In other words, users' perceptions of technology use either results in academic deterioration or leads to good productivity.

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Evidence from the literature shows that researchers have opposing opinions and attitudes towards the usefulness of social technologies in education, resulting in inconsistent results about their effectiveness on academic performance. Some research studies found that these technologies are useful because they pave the way for a productive learning environment wherein students interact and work collaboratively (e.g., Ansari & Khan, 2020; Al-Rahmi & Zeki, 2018; Davis & Yin, 2013; Hashemifardnia, et al., 2018; Enz & Kassens, 2016; Kirschner & Karpinski, 2010; Lund, 2008; Sobaih et al., 2022; Sun, 2010; Wamba & Carter, 2016). Some scholars aver that there is a negative relationship between social technologies use and academic performance (e.g., Mingle & Adams, 2015; Kolan & Dzandza, 2018; Obi et al., 2012; Wil et al., 2019).

Other scholars, like Kirschner and Karpinski (2010), Kolan and Dzandza (2017), Kuppuswamy & Narayan (2010), Maya (2015), Mensah and Nizam (2016), Osharive (2015), among others, argue that social media is a double-edged sword or, as Christian Lous Lang puts it, 'the most useful servant but a dangerous master.'

However, some researchers did dig deeper into personality traits and came up with theories that explain users' attitudes and adoption of technology (e.g., Teo et al., 2008; Tselios et al., 2011; Venkatesh & Davis, 2000; Venkatesh et al., 2003). Interestingly enough, it is found that the individual user's attitude—i.e., his/her personality traits—

is a determining factor towards either the good or bad use of social technologies. Accordingly, they place the blame on the habits of technology users rather than on social technologies per se (e.g., Kuppuswamy & Narayan, 2010; Mensah & Nizam, 2016; Kolan & Dzandza, 2017; Osharive, 2015).

Understanding the relationship that exists between ICTs use and language learning and how users use technology may give us more insights into this magnetic field of study. To this end, the present paper attempts to review prominent theoretical and empirical studies on the interconnections between the variables under question.

II. CONNECTIVISM: A LEARNING THEORY FOR THE DIGITAL AGE

Given that learning concepts have seen an outstanding evolution with the advent of technology, the idea of connecting people to social networks has become a real necessity. George Siemens, a Canadian theorist and prominent researcher on learning, coined the term Connectivism (Siemens, 2004), a learning theory for the digital age, to enhance our understanding of learning using digital technologies. Connectivism is therefore "social learning that is networked" (Duke et al., 2013, p. 6) that emerged with the rise of Web 2.0. Within the connectivist-learning model, learning takes place through connections and networking. The theory of Connectivism is based on the premise that knowledge resides within a network of connections, and that learners need to form connections in order to acquire knowledge and have a quality learning experience. It puts the learner and their network at the heart of the learning process.

Unlike the three existing learning theories, i.e., behaviorism, cognitivism and constructivism, connectivism exposes a key aspect of learning, namely forming connections and creating networks of learners who share and transmit knowledge among each other. This notion of knowledge transfer signifies an important pedagogical value for today's leading universities in their attempts to deliver and design online courses. Originating from Connectivist theory, the massive open online course (MOOC), which gained unprecedented popularity in the year 2012, is a very good example of distance learning with tremendously unlimited open-access resources aimed at community interactions among teachers and students worldwide. Not only do its participants take responsibility for what they learn, but also what and how to share it among them. Knowledge resides in the networks, and reciprocal interaction among individuals makes the process of learning efficient and rewarding. Connectivist MOOCs are based on principles from connectivist pedagogy

indicating that material should be aggregated (rather than pre-selected), remixable, repurposable, and feeding forward (i.e., evolving materials should be targeted at future learning). Another key concept that characterizes connectivist learning is collaboration, which contributes to the transmission of knowledge among learners and educators. Collaboration paves the way for individual and collective learning in that members of a group help one another in a collaborative manner towards meeting their learning goals.

Siemens (2004) delineates eight principles of connectivism:

- Learning and knowledge rest in a diversity of opinions.
- Learning is a process of connecting specialized nodes or information sources.
- Learning may reside in non-human appliances.
- Capacity to know more is more critical than what is currently known.
- Nurturing and maintaining connections is needed to facilitate continual learning.
- Ability to see connections between fields, ideas, and concepts is a core skill.
- Currency (accurate, up-to-date knowledge) is the intent of all connectivist learning activities.
- Decision-making is itself a learning process. Choosing what to learn and the meaning of incoming information is seen through the lens of a shifting reality. While there is a right answer now, it may be wrong tomorrow due to alterations in the information climate affecting the decision. (p. 9)

These principles shed laser light on the new roles expected of learners and teachers, as well as the pivotal role of technology in the teaching-learning process. First, the teacher's role is to assist and guide learners in establishing appropriate connections and networks of learning. Second, the learners should get involved in these networks to meet their learning objectives and create experiences that are conducive to lifelong learning. Third, technology plays a vital role in the teaching-learning process. In the same vein, Stephen Downes, a supporter of connectivist learning, states that knowledge is "distributed across a network of connections, into its nodes, and therefore, learning consists of the ability to construct and traverse those nodes connected into networks" (Downes, 2012, p. 9). In the current knowledge-based society, learning happens within the networks and that networked learning has become the normal mode of learning. Social networks,

blogs, wikis and other 2.0 technologies have led to new avenues of learning, in either formal or informal contexts, for many students across the globe. These technologies have facilitated learning by making abundant information readily accessible to users anytime and anywhere.

Unlike traditional media, modern technologies offer a plethora of interactive platforms for users. The Internet, as a concept, was initially about surfing different information related to various fields, but with the current advances in science and technology, it has set a common interactive platform for communicating and sharing a host of individual views, opinions, personal events and experiences. Hence, as Faizi (2018) puts it, the Internet "has evolved from being a read-only platform that people used to access information into a read-write universal channel in which users are producers and consumers of digital content" (p. 86). Overall, ICT skills are becoming more and more a requisite in order to do well in today's fast-paced society. These skills would definitely help teachers and learners fully utilize the opportunities presented by digital technology. However, the adoption of modern technologies for learning depends on how well learners accept them.

III. CORRELATIONAL STUDIES

Much ink has been spilled on the relationship between ICTs use and academic achievement. Several scholars made attempts to address the following questions: Is there any relationship between social technologies use and academic achievement? Are social technologies beneficial or detrimental to the language learning process? Broadly, studies on the relationship between social technologies use and academic achievement are not all homogenous and consistent. Some argue in favor of the beneficial academic aspect of social media use, while others argue just the opposite.

Numerous studies have shed light on the important role social technologies play in students' academic performance in higher education. A study conducted by Faizi (2018) revealed that students and language faculty members are immersed in virtual online communities for educational purposes and make beneficial uses of these online platforms. Moreover, these users acknowledged that Web 2.0 technologies exert a positive impact on language teaching and learning. Another study led by Wheeler et al. (2008) found that social media usage by university students has four main advantages, namely it helps improve learning motivation, it offers personalized course materials, it develops collaborative abilities, and finally it boosts relationships and networking. In another study by Worthen et al. (1994), they found out that students with

computer-assisted technologies outperform their peers who use traditional methods of education. Khan (2012) conducted a research study to explore the impact of SNSs on university students. He found that students with a 3.0 to 3.5 GPA mostly use social media applications for entertainment. This finding signifies that a large proportion of doctorate students use social media platforms to better their academic performance. In the same line of findings, Jain et al. (2012) conducted a study and found that students are fond of using social media as a helpful learning tool to boost their confidence for presentations and reports. Jain and his colleagues also found that chatting online and texting on social media platforms helps improve their communicative skills in English. They also found that by chatting, the inferiority complex of writing and speaking is thus reduced to the minimum. Another interesting study was conducted by Ahmed (2019) to examine the pedagogical role of WhatsApp as one of mobile-assisted language learning applications in developing reading and writing skills. Its findings revealed that WhatsApp is a very effective application in developing students' motivation to improve their reading and writing skills. Thanks to WhatsApp English-medium groups, students were able to expand their vocabulary repertoires and improve their grammar, reading comprehension and writing skills. The study also found that students displayed positive perceptions of WhatsApp as a pedagogical learning tool. Likewise, Yunus and Salehi (2012) undertook a study to investigate students' perceptions regarding the effectiveness of Facebook groups for teaching and improving writing. Their findings reveal that social media usage does help students expand their vocabulary repertoires in English, improve their writing skills and reduce their spelling mistakes. These scholars conclude that "the main challenge that teachers need to take note of is the distractions by other features of FB such as FB chat, games, and other applications" (Yunus et al., 2012, p. 95). Overall, it is incumbent on users to be prudent and cautious towards social network technologies usage lest their academic lives be affected.

As a matter of fact, social technologies have tremendously facilitated learning and broadly impacted the nature of learning in higher education as never before. Different researchers conducted research to see the influence of social media on users' academic performance and found positive relations between the use of SNSs and academic achievement. Quader (2014) found that students who use SNSs score higher on reading skills tests and have higher grades than their counterparts who do not. He also asserts that social media platforms offer greater opportunities for students to expand their learning by freely discussing various subjects, unlike in formal classroom contexts

where they might feel uncomfortable communicating their ideas and thoughts. Another study was conducted by Kabilan et al. (2010) to see if Facebook supports or boosts language learning in English. Their findings indicate that Facebook does boost students' motivation, confidence and attitudes towards English language learning. Furthermore, 74.1% of the students claim that engagement in Facebook instills positive attitudes towards English language learning. In short, Kabilan and his colleagues' research indicates that Facebook motivates students to improve their reading skills and hone their writing skills in particular. In the same vein, Bani-Hani et al. (2014) undertook a study in Jordan to investigate EFL University students' perceptions and attitudes towards utilizing Facebook groups in teaching writing as well as the role Facebook groups play in enhancing writing performance level. They found that "utilizing a Facebook group in language instruction does indeed assist in language acquisition and helps to better develop writing skills, particularly in the pre-writing phase, as well as helps students to better develop their vocabulary and lessen spelling mistakes" (Bani-Hani et al., 2014, p. 33). Another study was made at the University of Bahrain by Harrath and Alobaidy (2016) to explore the relationship between the use of SNSs and Arabian Gulf students' academic performance. These researchers found a positive impact of social media platforms on students' academic level through optimal use of social networking sites. These students, as this study concludes, display sheer awareness of using social networks for educational purposes. Another study was conducted by Mahamat (2014) to obtain Malaysian university students' perceptions on how their use of SNSs impacts their academic performance. The results of this study showed that a substantial proportion of students concurred that SNSs positively impact their academic performance. In the same vein, Gremu and Halse (2012) argue that "students are, however, keen to use SNSs for academic purposes, and this presents an opportunity to engage them to learn informally by seeking, exploring and testing ideas with other students within their own social network" (p. 2).

Junco et al. (2011) conducted a longitudinal study to see the link between social media use and students' grades. These scholars split students into two groups. One group used Twitter for academic purposes while the other did not. The results of their study indicate that students in the Twitter group have higher GPAs than their counterparts.

In the above paragraphs, prominent studies on social technologies use and their positive effects on academic achievement have been presented. However, other studies have yielded different results of social technologies'

effects on academic outcomes. To begin with, Rather (2013) asserts that:

The Social networking sites and blogs which are being used today with tremendous passion and zeal have transformed the way of using internet in recent years by describing online tools and utilities which allow users for communication, participation and collaboration of information online. Today's young generation, especially teens and youth are using technology through innovative ways due to which they are referred to as Millennials and have changed the ways we think, work and communicate even though they are in formative years of their life. Today's youth because of these social networking sites have become technology addicts and are quite introverted. (p. 69)

The findings of Rather's (2013) study show that there is an inverse relationship between the overuse of Facebook and academic grades, as more time spent on Facebook results in lower academic grades. The same result is yielded by Junco (2012) in his study. Similarly, Boogart and Robert (2006) conducted a major research study at four institutions across the United States of America, investigating the impact that social media technologies have on university campuses. The researcher found that Facebook use is negatively associated with students' overall grades. He notably ascribes this fact to their heavy use of Facebook. In fact, this notion of prolonged use of social media is investigated by many scholars. For example, Karpinski and Duberstein (2009) found that students' heavy use of Facebook has drastic effects on their productivity. These researchers came up with the conclusion that Facebook users are more likely to have a lower GPA. Kirschner and Karpinsky (2010) conducted a similar study on the link between the two variables under question and found out that Facebook users devote less time for studies and hence get a lower GPA as opposed to their counterparts who are constantly off line. Another study done by Fawzi and Firas (2013) at Irbid University in Jordan in 2013 reveals that the less time students spend on social media applications, the higher their GPA gets. It is worth noting that in this study, a large proportion of students use Facebook for chitchatting with friends and not for educational purposes. In an important study by Helton (2012), she found that academic impairment is not solely ascribed to Facebook use, but it is a factor among others. She points out that Facebook is a learning tool that offers a wide array of options for social networking and entertainment. For instance, users can play interactive games involving other people on the platform. This fact drives them to feel intrigued and excited to come back

repetitively on the site for such a leisurely motive. Other scholars like Obi et al. (2012) came to the conclusion that social media usage results in language deterioration in that students get unconsciously accustomed to using abbreviations while chatting with other users and hence reproducing the same errors in formal writings. Similarly, an interesting study made by Mingle et al. (2016) on social media usage and academic performance in public and private high schools revealed that a large proportion of students use WhatsApp and Facebook more often and that students from the private schools spend more hours online as compared to their counterparts in the public schools. Findings of this study also came up with the conclusion that these students witnessed a drop in grades due to their misuse of these technological tools. Mingle et al. (2016) concluded that these students need counseling for their addiction.

In a nutshell, different uses of social media applications and how users use technology is a determining factor that impacts students' productivity. Certain uses result in academic deterioration, while other uses lead to good productivity. It is up to the individual user and how s/he perceives technology use. Last but not least, social networking platforms can be a lethal weapon that distracts students from their studies, but these platforms can be tremendously useful for education based on judicious use.

Overall, and based on the results, it can be said that the studies claiming a negative relationship between social technologies use and academic achievement share one thing in common and that is the use of social media for non-academic goals. Accordingly, the nature of usage does have an impact on students' performance. In other words, using social media positively for educational purposes is a surefire way to bring about positive outcomes in students' academic lives. Evidence from the literature indicates that the habits of technology users are to be blamed and not the ICTs per se. Put differently, in order to generate positive results and achieve academic success, technology users must strike a balance between social technologies and academic activities. Asad et al. (2012) conclude that "students' academic learning outcomes could increase when their social learning outcomes were heightened" (p. 501).

IV. THEORIES AND MODELS OF EDUCATIONAL TECHNOLOGY ACCEPTANCE

Over the last few decades, technology user acceptance has dramatically piqued the interest of many IT researchers and practitioners. In the literature associated with technology adoption and diffusion, users' uptake of new technology is "described as one of the most mature

research areas in the contemporary information system (IS) literature” (Venkatesh et al., 2003, p. 426). Researchers have come up with several intriguing theories and models that explain users’ uptake of technology. These theoretical models draw their thoughts and reflections from various fields, namely sociology, psychology and the information science and technology field. They briefly discuss the most influential and leading scholarly attempts underlying the field of technology acceptance and diffusion. These are the theory of reasoned action (TRA), the technology acceptance model (TAM), (TAM2), the motivational model (MM), the theory of planned behavior (TPB), the technology acceptance model, the PC utilization model, the innovation diffusion theory (IDT), the social cognitive theory (SCT), the model of PC utilization (MPCU), and the Unified Theory of Acceptance and Use of Technology (UTAUT). And because of the fact that UTAUT is a widely adopted technology acceptance theory, much focus will be laid on it.

4.1. The Unified Theory of Acceptance and Use of Technology (UTAUT)

The UTAUT model was postulated by Venkatesh et al. (2003) to explain users’ technology acceptance. It is a seminal work that synthesized elements from the above-mentioned models of technology adoption and use. The elements or constructs that were used by these researchers in coming up with UTAUT were the ones that proved to be strong predictors of behavior intention. According to Venkatesh et al. (2003), researchers are:

confronted with a choice among a multitude of models and find that they must “pick and choose” constructs across the models, or choose a “favored model” and largely ignore the contributions from alternative models. Thus, there is a need for a review and synthesis in order to progress toward a unified view of user acceptance. (p. 426)

Subsequently, these researchers thought of theorizing a powerful and comprehensive model that could be used on a large scale across a wide array of applications. As illustrated in Fig 1., the UTAUT model is built on four key core constructs, namely Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), and Facilitating Conditions (FC). These elements play a key role as direct determinants of user acceptance and use. According to these scholars, such determining factors are moderated by four distinct moderators, namely gender, age, voluntariness and experience.

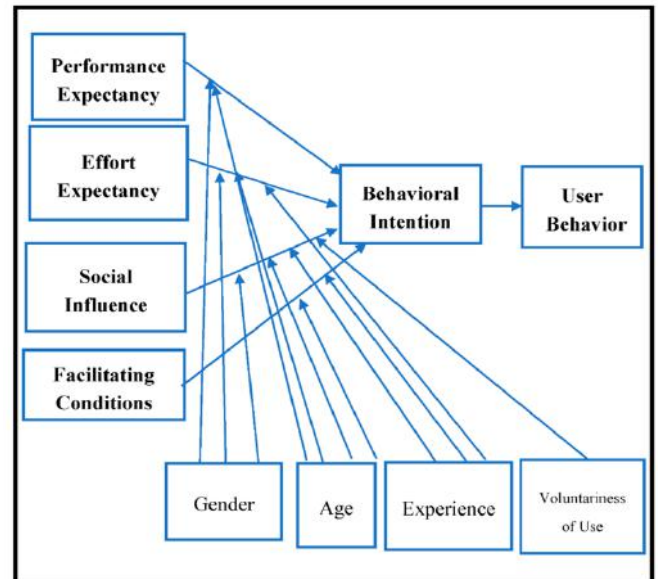


Fig. 1: The UTAUT Model by Venkatesh et al. (2003)

As far as the constructs of UTAUT are concerned, Table 1, proposed by Sharma and Mishra (2014), gives us a clear picture about their definitions, the original models where predictors are taken, and the moderators that affect the relationship between those constructs.

Table 1: Constructs Used in UTAUT by Venkatesh et al., 2003

Construct	Definition	Root source of the construct from earlier models	Moderators
Performance expectancy	Performance expectancy is defined as the degree to which an individual believes that using the system will help him or her to attain gains in job performance.	The five constructs from the different models that pertain to performance expectancy are perceived usefulness (TAM/ TAM2), extrinsic motivation (MM), job-fit (MPCU), relative advantage (IDT), and outcome expectations (SCT).	Gender, Age
Effort expectancy	Effort expectancy is defined as the degree of ease associated with the use of the system.	Three constructs from the existing models capture the concept of effort expectancy: perceived ease of use (TAM/TAM2),	Gender, Age, Experience

		complexity (MPCU) and ease of use (IDT).	
Social influence	Social influence is defined as the degree to which an individual perceives that important others believe he or she should use the new system.	The three constructs related to social influence: subjective norm (TRA, TAM2/IDTPB, TPB), social factors (MPCU), and image (IDT).	Gender, age, voluntariness and experience
Facilitating conditions (no effect on use intention but direct effect on use behaviour)	Facilitating conditions are defined as the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system.	Three different constructs used in earlier models are: perceived behavioural control (TPB, DTPB, C-TAM-TPB), facilitating conditions (MPCU) and compatibility (IDT).	Age and experience

Source: Sharma and Mishra (2014)

According to Venkatesh et al. (2003), Performance Expectancy (PE) refers to the “degree to which an individual believes that using the system will help him or her to attain gains in job performance” (p. 447). To put it differently, PE is about the individual’s perceived rewards gained out of using a particular system. Users use technology with the objective to perform job-related tasks and are expected to use a given system that they believe will maximize their performance. Behavioral intentions to use computers are positively influenced by the individual’s performance expectancy. PE encompasses five constructs from the aforementioned models, namely perceived usefulness (TAM, TPB, and TAM2), extrinsic motivations (MM), relative advantage (IDT), outcome expectancy (SCT) and job-fit (MPCU). These constructs proved to be strong predictors of intention in their relative models. The term ‘unified’ refers to the initial letter ‘U’ in UTAUT, which stands for unifying strong predictors from the reviewed eight models, namely the theory of reasoned action (TRA), the technology acceptance model (TAM), the motivational model (MM), the theory of planned behavior (TPB), the innovation diffusion theory (IDT), the social cognitive theory (SCT), the model of PC utilization (MPCU) and a combined (TPB/TAM). It is worth noting that the relationship between Performance Expectancy and Behavioral Intention is mediated by two key elements, namely age and gender.

The second construct of behavioral intention labeled ‘Effort Expectancy’ (EE) refers to the “degree of ease associated with the use of the system” (Venkatesh et al., 2003, p. 450) meaning that when the user perceives that a given system is easy to manipulate, the rate of adopting it becomes high. Hence, the level of easiness of a given system defines individuals’ behavioral intention to use it. UTAUT posits that “three constructs from the existing

models capture the concept of effort expectancy: perceived ease of use (TAM/TAM2), complexity (MPCU), and ease of use (IDT)” (Venkatesh et al., 2003, p. 450). According to Venkatesh et al. (2003), the impact of effort expectancy on behavioral intention is regulated by three moderators, namely gender, age and previous experience with technology.

The other construct named Social Influence (SI) is defined as “the degree to which an individual perceives that important others believe he or she should use the new system” (Venkatesh et al., 2003, p. 451). That is to say, the individual’s adoption of a particular system emanates from an influence exerted by the surrounding environment, such as the attitudes and views of superiors, friends, peers, family members, etc. Thus, the SI construct does positively influence behavioral intention and, ultimately, the individual’s behavior to adopt a given system. In the same vein, the two scholars, Theotokis and Doukid (2009) came up with findings that proved that Social Influence exerts a positive influence on social networking, or what is called hedonic online technologies. UTAUT postulates that Social Influence encompasses three powerful predictors from previous models, namely “subjective norm in TRA, TAM2, TPB...social factors in MPCU and image in IDT” (Venkatesh et al., 2003, p. 451). It is worth noting, as clearly illustrated in the graph above, that the relationship between Social Influence and Behavioral Intention is moderated by age, gender, experience and voluntariness of use.

The fourth and last determining construct of behavioral intention, called Facilitating Conditions (FC), refers to “the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system” (Venkatesh et al., 2003, p. 453). The FC construct measures the extent to which various situational

factors lead to the use and adoption of a given system. UTAUT posits that Facilitating Conditions encompasses three constructs from previous models, namely “perceived behavioral control (TPB), Facilitating Conditions (MPCU) and compatibility (IDT)” (Venkatesh et al., 2003, p. 453). However, as opposed to (PE), (EE), and (SI), the (FC) predictor exerts a direct influence on the individual’s usage behavior and that its effect is not mediated by behavioral intention as is the case with the other predictors. And as clearly depicted in the figure, only age and experience moderate the relationship between facilitating conditions and use behavior.

It is worth noting that UTAUT introduced four moderators, namely gender, age, experience and voluntariness of use (Table 1). These elements play a significant role in giving us explanations about the behavior differentiation in different relationships. For instance, the influence of Performance expectancy on individuals’ behavioral intentions is moderated by gender and age. Equally, the effect of effort expectancy on behavioral intentions is moderated by gender, age and experience. And while the effect of social influence on behavioral intentions is moderated by all four moderators, the effect of facilitating conditions on use behavior is moderated by age and experience only.

Several studies have theorized users’ age, gender and experience as moderators in the original UTAUT model. Primarily, gender has a moderating effect on performance expectancy, effort expectancy, and social influence on individuals’ behavioral intention to use technology. In their empirically conducted study, Venkatesh and Morris (2000) found out that perceived usefulness, that is to say Performance Expectancy in UTAUT, was more salient for men, while perceived ease of use was more salient for women (Venkatesh et al., 2003, p. 433). According to them, the rate of performance expectancy is found to be higher among men compared to women. This is ascribed to the fact that “men tend to be highly task-oriented” (Venkatesh et al., 2003, p. 449). In the same vein, regarding the effect of social influence on behavioral intention, these researchers confirmed that “women tend to be more sensitive to others’ opinions and therefore find social influence to be more salient when forming an intention to use new technology” (Venkatesh et al., 2003, p. 453), unlike men who display less sensitivity to social influence in technology usage. To back up this idea, Cheng et al. (2011) conducted an empirical study in Taiwan on the moderating effect of age and gender on intention to use mobile devices for learning and found out that “when a mobile device was introduced for mobile learning, the perception of the social influence would cause higher

intention for young females than males” (Cheng et al., 2011, p. 155).

As for the second key moderating variable named ‘age’, it is as important as ‘gender’ in that it moderates the effect of the four UTAUT determinants of usage intention. To highlight its significant role, Venkatesh et al. (2003) confirmed that “studies of gender differences can be misleading without reference to age” (Venkatesh et al., 2003, p. 450). Equally important, these scholars referred to the conducted research on job-related attitudes indicating that “younger workers may place more importance on extrinsic rewards” (Venkatesh et al., 2003, p. 450). This moderating variable is very important despite the little attention it was accorded in the technology acceptance literature. Hence, as indicated by Venkatesh et al., the moderating effect of age on performance expectancy on behavioral intention becomes stronger for young users. As for the effect of age on effort expectancy, they asserted that older people are more influenced by the effort needed for technology usage compared to youngsters. Additionally, the effect of social influence on individuals’ behavioral intention was reported to be stronger for older people who, as opposed to younger users, displayed a far more positive attitude towards technology adoption due to the social pressure factor.

Regarding the third moderating variable, namely experience, Venkatesh et al. (2003) speculated that the users’ experience with technology moderates the effect of UTAUT’s three constructs, which are effort expectancy, social influence, and facilitating conditions on behavioral intention. Users who hardly have any experience with technology or are in the early stages of experience with technology undergo a decrease in terms of the effects of effort expectancy on intention. Last but not least, the fourth moderating variable related to voluntariness is posited to moderate the effect of social influence on individuals’ behavioral intention only. In other words, the influence of the surrounding environment on individuals’ behavioral intention to use technology is believed to be stronger in mandatory settings.

V. CONCLUSION

ICT and its effects on education is a topic that has received a great deal of attention and investigation among researchers and scholars worldwide. More than ever, millennials’ dependency on social technologies has gone viral across the globe. Modern technologies have undoubtedly shaped the way we communicate and search for information. This research, therefore, holds a relevant significance for mainly two prominent points. Firstly, it is progressively important to target our attention to the very

clear change noticed in the educational landscape because of the use of technology, taking into consideration the varied ways of computer-based English language learning to point out the role of ICT. Secondly, while much ink has been spilled on education stakeholders' perceptions of the ICT integration in the field of education, more studies and efforts are still needed in this area.

This study has contributed additional empirical knowledge to the field of educational technology and media studies. It has highlighted the utility of ICT as an educational tool and the risks associated with these new technologies. Previous studies have proved that ICTs' different use patterns have a bearing on students' academic performance. Millennials have recourse to social technologies for either learning or entertainment purposes, and this impacts their academic performance. Overall, it is widely asserted among educators and scholars that these technologies and applications pave the way, if rightly used, for an engaging mode of learning whereby students become active and lifelong autonomous learners (Lee, 2016; Saunders & Klemming, 2003; Smith & Craig, 2013).

In summary, this research endeavor has the potential to generate an interesting contribution to the ongoing research pertaining to the field of education and ICT. It is also hoped that this work can make a contribution to the field of media studies through addressing media-related issues and concerns and giving recommendations to education stakeholders so that they would be well-informed about the risks and adversities lurking over this magnetic field of study.

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